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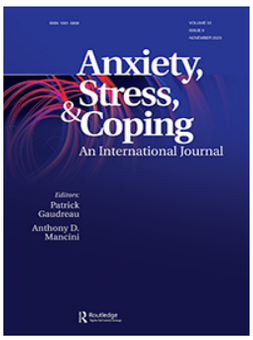

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Meaning in life and resilience to stressors

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ABSTRACT

Background: and Objectives: This research examined whether life meaning promotes resilience to stressor-related psychological distress and repetitive negative thinking.

Design and Methods: Three studies (total $N = 273$) used cross-sectional (Study 1) and prospective (Studies 2 and 3) designs to assess the relation between life meaning and response to various stressors.

Results: Results showed that in Study 1, greater life meaning was inversely related with repetitive negative thinking and psychological distress. Further, a mediation analysis showed an indirect effect for the life meaning-repetitive negative thinking relation through psychological distress. In Study 2, baseline life meaning predicted less repetitive negative thinking about a subsequent city-wide flood. In Study 3, baseline life meaning was inversely related to distress and repetitive negative thinking after writing about an aversive memory. A mediation analysis showed an indirect effect for the life meaning-repetitive negative thinking relation through distress.

Conclusions: In all studies, life meaning predicted outcomes when controlling for other positive well-being variables. Overall, the findings suggest that individuals with greater trait life meaning experience less stressor-related distress and repetitive negative thinking and that the life meaning-repetitive negative thinking relation may be mediated by distress.

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> Woe to him who saw no more sense in his life, no aim, no purpose, and therefore no point in carrying on. He was soon lost. (Frankl, 1946/1959, p. 98)

Introduction

The idea that human flourishing requires commitment to significant values and goals is as old as ancient religious and philosophical traditions (Hadot, 1995; Smith, 1991). Several clinical psychology forebears adopted this idea and applied the concept of meaning in life to their models of psychological suffering and treatment (Frankl, 1946/1959; Horney, 1950; Jung, 1954). As exemplified in the opening quote, Frankl proposed that life meaning promotes resilience against traumatic events. His book *Man's search for meaning* illustrates the crucial role of life meaning in the psychological and physical well-being of prisoners in Nazi concentration camps.

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Over the last 20 years, there has been increasing research on the construct of life meaning and its psychological benefits. Recent theoretical reviews suggest that life meaning consists of purpose (feeling like one's life is motivated by valued goals), coherence/comprehension (feeling like one's life makes sense), and significance/mattering (feeling that one's life matters in the big picture; George & Park, 2016; Martela & Steger, 2016). Research with life meaning measures (that often combine purpose and coherence items) has shown that meaning is inversely related with psychological distress (for a review, see Steger, 2012). Less is known about the relation between life meaning and repetitive and intrusive negative thoughts (repetitive negative thinking) that accompany aversive events. Repetitive negative thinking represents an important distress-related variable for a number of reasons, including its use of attentional resources, thereby impairing performance in other problem-solving tasks (Lyubomirsky & Nolen-Hoeksema, 1995; Mikulincer, 1989) and its contribution to the development (Nolen-Hoeksema et al., 2008) and maintenance (Ehring & Watkins, 2008) of numerous psychological disorders. The current studies examined whether life meaning protects against stressor-related subjective distress and repetitive negative thinking.

Meaning disruption, distress, and repetitive negative thinking

Why might life meaning promote resilience to stressors? One line of argumentation is that meaning (i.e., as a sense of purpose or coherence; George & Park, 2016) inhibits the psychological distress associated with uncertainty (Hirsh et al., 2012; Janoff-Bulman & Yopyk, 2004). This perspective further proposes that aversive arousal from meaning violations elicits motivation to recapture meaning in order to reduce the distressing state (Park, 2010; Proulx et al., 2012). Social cognition researchers have noted a number of indirect paths through which an overall sense of meaning can be restored, such as affirmation of cultural values unrelated to the violation (Rosenblatt et al., 1989) and searching for patterns in neutral information (e.g., letter strings; Proulx & Heine, 2009). One clinically-important direct attempt of meaning-restoration consists of repetitive negative thinking, which aims to restore meaning via reflection on the causes and consequences of a negative event (Nolen-Hoeksema et al., 2008). That is, such repetitive negative thinking can be considered as "a form of looking" that continues "until people find what they are looking for" (Martin & Tesser, 1996, p. 11). At the extreme, inability to restore meaning is proposed to play a causal role in the development of post-traumatic stress disorder (PTSD), with symptoms of intense distress and event-related repetitive negative thinking (Brewin et al., 2010; Dalgleish, 2004; Janoff-Bulman, 1992; Park, 2010; Park et al., 2012). In sum, there is converging evidence that meaning violations lead to (i) psychological distress that (ii) elicits attempts to restore that meaning and (iii) that repetitive negative thinking is an example of maladaptive meaning restoration (Nolen-Hoeksema et al., 2008). This model suggests that strong life meaning should promote psychological resilience through inhibiting uncertainty and concomitant distress.

There are a number of theories that elaborate on the general idea that life meaning should promote resilience. For example, a strong sense of life meaning may relativize a specific violation of beliefs/goals, making that violation less aversive (Frankl, 1946/1959; Jung, 1954). From this perspective, the individual can rise "above the sufferings of the moment" (Frankl, 1946/1959, p. 95). The ability to rise above acute distress may be due to the abstract nature of the values and goals related to life meaning (Emmons, 1999; Peterson, 1999) eliciting a high-level construal mode of information processing, as such high-level processing has been shown to reduce the aversive impact of violations of beliefs/goals (De Dreu et al., 2009). Further, if the life meaning source is more important than the discrepancy, one's cognitive and motivational responses should be drawn toward life-meaning cues (McGregor et al., 2010). In other words, after a meaning violation, the tendency to be "occupied with retrospective thoughts" (Frankl, 1946/1959, p. 92) can be overcome by life meaning-related stimuli that serve as "an alternative focus for eager absorption" (McGregor et al., 2010, p. 133). In this way, life meaning may lead to less repetitive negative thinking both through direct effects (i.e., providing another source of attentional absorption) and

through indirect effects (i.e., reducing the psychological distress that prompts repetitive negative thinking).

Meaning and resilience research

A growing literature suggests that having global life meaning creates resilience to stressors. Cross-sectional studies show that life meaning is inversely related to general psychological distress, anxiety, and depression (Debats, 1996; Steger et al., 2009). Cross-sectional research has also found that meaning moderates the relation between trauma intensity and PTSD symptoms (Haynes et al., 2017). Studies with prospective designs have also found an inverse relation between life meaning and negative affect (Eakman, 2014; Schaefer et al., 2013; Scheffold et al., 2014). For example, research has shown that baseline life meaning inversely predicts psychological distress assessed nearly a year later (Eakman, 2014). Further, in a study that used startle response to operationalize negative affect, life meaning predicted less initial reactivity to stressful pictures as well as greater post-stressor recovery (Schaefer et al., 2013).

Related findings are provided by research with experimental designs using meaning affirmations (i.e., thinking about important values which may thereby reconnect the individual with sources of life purpose). One study found that compared to control, a meaning affirmation (thinking about important values) before a stressful task resulted in less post-stressor cortisol response but not less self-report negative affect (Creswell et al., 2005). Another study found that a meaning affirmation (about religious values in religious participants) before a Stroop task resulted in less negative affect after task errors, as indicated by neural response (Inzlicht & Tullett, 2010). Related, another study showed that a meaning affirmation (to socio-political values) before presentation of playing cards with anomalous items resulted in a diminished arousal response to the anomalous cards, as indicated by pupil dilation (Sleegers et al., 2015). These studies suggest that life meaning assessed or affirmed before a stressor acts as a protective factor regarding stress-related responses.

In addition to the accumulating evidence for an inverse relation between global life meaning and affective responses to stressors, several studies have begun to examine the relation between life meaning and repetitive negative thinking. Two cross-sectional studies found an inverse relation between life meaning and depressive repetitive negative thinking (Boyraz & Efstathiou, 2011; Steger et al., 2008). There are contradictory findings on the relation between life meaning and repetitive negative thinking related to a specific aversive event, with one study finding significant results (Groleau et al., 2013) and a second study finding null results (Triplett et al., 2012). The latter two studies were conducted by the same team with similar methods, so it is difficult to interpret the discrepant findings. One possibility is that intensity of stressors may alter the relations – i.e., the Groleau et al. study involved more intense stressors, as that study had an inclusion criterion of the event needing to be sufficiently stressful (score of 5 or more on a 7-point scale). In sum, the findings from previous studies suggest that life meaning may be inversely related with repetitive negative thinking but inconsistent findings suggest that more research is needed.

Current studies

Previous theory and research support the idea that life meaning may help the individual navigate the stresses of life. Although there is relatively little research on the relation between life meaning and stress-related repetitive negative thinking, there is an accumulating base of findings showing that life meaning is inversely related to psychological distress. These findings have been demonstrated both with cross-sectional studies and with experimental designs in which life meaning is manipulated before a stressor. Although such findings are promising, this research has generally examined bivariate relations between life meaning and distress-related variables. One advance would consist of controlling for other well-being variables, as this would provide evidence that the effects are due to something specific to life meaning. The current research was designed to examine whether the

benefits of life meaning for dealing with stressors extends to reducing repetitive negative thinking and whether inverse relations between life meaning and stress response remain when controlling for other well-being variables that were selected because they have also been shown to be inversely related to stress responses and have been as controls in previous meaning-related research. In Study 1, we used a cross-sectional design to examine whether life meaning is inversely related to repetitive negative thinking and whether this relation is partially mediated by an inverse relation between life meaning and psychological distress. Studies 2 and 3 tested the research question with prospective designs. Study 2 examined whether life meaning assessed before an impending city-wide flood is inversely related to repetitive negative thinking about that flood at a follow-up session. Study 3 examined whether greater life meaning would predict less repetitive negative thinking about participants' most aversive life event in a subsequent rest period and whether this relation would be partially mediated by distress associated with thinking about the event.

Study 1

Although the theoretical analysis above supports the idea that life meaning is inversely related with stressor-related repetitive negative thinking, only a few studies have directly examined this question. Two studies used depressive repetitive negative thinking (Boyraz & Efstathiou, 2011; Steger et al., 2008) and two studies used trauma-related repetitive negative thinking (Groleau et al., 2013; Triplett et al., 2012). Study 1 is designed to build upon these findings in two ways. First, the current study used the Perseverative Thinking Questionnaire (Ehring et al., 2011) to assess repetitive negative thinking. Compared to other measures of repetitive negative thinking that have disorder-specific content, the Perseverative Thinking Questionnaire is designed as a transdiagnostic measure. Finding a relation between life meaning and the Perseverative Thinking Questionnaire would provide evidence that life meaning is inversely associated with repetitive negative thinking outside the specific realms of depression or trauma. Second, this study includes a mediation model. Building on previous findings that life meaning predicts less repetitive negative thinking (Steger et al., 2008) and less anxiety (Steger et al., 2009) and that repetitive negative thinking is related to psychological distress (Blagden & Craske, 1996; Watkins, 2009), we examined psychological distress as a potential mechanism. We predicted an inverse relation between life meaning and repetitive negative thinking and also that this relation would be mediated by distress. We further predicted that these relations would remain significant when controlling for relationship quality, which along with purpose represents a key element in models of psychological well-being (Ryff & Keyes, 1995). Purpose and relationship quality have shown similar inverse relations with negative affect variables (Kitamura et al., 2004; Ryff & Keyes, 1995) and have been compared against each other in previous research (Friedman & Ryff, 2012). These hypotheses were examined in a sample of undergraduate participants who completed self-report measures of these constructs.

Materials and methods

Participants

Ninety-three undergraduate students at a Dutch university volunteered to participate as partial fulfillment of a class requirement. The study was approved by the psychology department Institutional Review Board. Two participants reported English fluency that was below *moderately fluent* on a 5-point scale (i.e., as *not at all fluent* or *only somewhat fluent*) and were subsequently omitted from analyses. The final sample of 91 participants had a $M_{age} = 20.44$ years ($SD_{age} = 1.98$) and were primarily female ($n = 66$) and resulted in a power of .90 to detect a medium effect size relation.

Measures

Meaning in life. Meaning was assessed with the Purpose in Life scale (Ryff, 1989; Ryff et al., 1994). This scale consists of 14 items (e.g., "I have a sense of direction and purpose in life") using a scale ranging

from 1 (*Strongly disagree*) to 6 (*Strongly agree*). The Purpose in Life scale demonstrated strong internal consistency ($\alpha = .87$).

Relationship quality. Quality of relationships was assessed with the Positive Relations With Others scale (Ryff, 1989; Ryff et al., 1994). This scale also consists of 14 items (e.g., "I know that I can trust my friends, and they know they can trust me.") using a scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). The scale demonstrated strong internal consistency ($\alpha = .85$).

Psychological distress. Distress was assessed with the Depression, Anxiety, and Stress Scales (DASS; Lovibond & Lovibond, 1995). The DASS consists of 21 items that use a response scale ranging from 0 (*Never*) to 3 (*Almost always*) to assess psychological distress over the previous-week, including seven items that assess anxiety (e.g., "I felt I was close to panic"), seven stress-related items (e.g., "I found myself getting agitated"), and seven depression-related items (e.g., "I felt down-hearted and blue"). The overall DASS demonstrated good internal consistency ($\alpha = .92$), as did the anxiety ($\alpha = .80$), stress ($\alpha = .80$), and depression ($\alpha = .90$) scales.

Repetitive negative thinking. Individual differences in repetitive negative thinking were assessed with the Perseverative Thinking Questionnaire (Ehring et al., 2011). This measure consists of 15 items that assess how the individual typically thinks about negative experiences or problems (e.g., "The same thoughts keep going through my mind again and again.") using a scale ranging from 0 (*Never*) to 4 (*Almost always*). The Perseverative Thinking Questionnaire demonstrated strong internal consistency ($\alpha = .93$).

Procedure

Participants completed assessment procedures in groups consisting of one to three participants seated in private workstations. After signing an informed consent form, participants completed a packet of measures that included demographics and the measures listed above. Participants were then debriefed.

Results

Correlation analyses

Statistical analyses for all studies were conducted with SPSS version 24 (IBM Corp., 2016). Bivariate correlation analyses showed that life meaning was inversely related both with repetitive negative thinking and with psychological distress and that repetitive negative thinking was positively related with distress (see Table 1). The strength of the relations ranged from medium-large to large effects (Cohen, 1992). Life meaning was positively related with relationship quality, and the latter measure was also inversely related with repetitive negative thinking and psychological distress with medium to large effect sizes. The prediction that life meaning would continue to show an inverse relation with repetitive negative thinking and distress when controlling for relationship

Table 1. Bivariate correlations among Study 1 variables ($N = 91$).

Variable	*Mean*	*SD*	1	2	3
1. Meaning in life	4.26	0.77	–		
95% CI					
2. Positive relationships	4.55	0.76	.50***	–	
95% CI			(.32, .69)		
3. Negative thinking	3.24	0.69	−.43***	−.30**	–
95% CI			(−.62, −.24)	(−.50, −.10)	
4. Psychological distress	15.97	10.45	−.65***	−.53***	.65***
95% CI			(−.81, −.49)	(−.71, −.35)	(.49, .81)

*$p < .05$. **$p < .01$. ***$p < .001$.

quality was assessed with partial correlation analyses. The results showed that when controlling for relationship quality, life meaning was inversely related both with repetitive negative thinking, $pr(88) = -.34$, $p = .001$ and with distress, $pr(88) = -.53$, $p < .001$.

Mediation analyses

The hypothesis that psychological distress would partially mediate the relation between life meaning and repetitive negative thinking was tested using version 3.3 of the PROCESS macro for SPSS (Hayes, 2013), in which perseverative thinking was regressed on life meaning, with individual differences in distress entered as the proposed mediator. Figure 1 illustrates that distress was related both to life meaning and repetitive negative thinking and that the relation between life meaning and repetitive negative thinking was reduced when controlling for psychological distress. A bias-corrected bootstrap 95% confidence interval for the indirect effect ($B = -0.374$) based on 10,000 bootstrap samples did not include zero (−0.522 to −0.232), indicating a model in which the relation between life meaning and repetitive negative thinking is partially accounted for by individual differences in psychological distress.[1] The total effect reduced from $B = -0.388$, $t = -4.511$, $p < .001$ to a direct effect of $B = -0.014$, $t = -0.146$, $p = .884$. The mediation effects remained significant when relationship quality was added as a covariate, as the 95% confidence intervals for the indirect effect did not include zero, (−0.442 to −0.184).

Given the cross-sectional nature of the data, the direction of the mediation model cannot be determined. Although our theory proposes that the psychological distress represents a mechanism of the inverse relation between life meaning and repetitive negative thinking, it is possible that the direction goes the other way – that meaning could mediate the relation between psychological distress and repetitive negative thinking. We examined this possibility with a post-hoc mediation analysis in which psychological distress was entered as the predictor and life meaning as the potential mediator. The results showed that meaning did not act as a mediator ($B = 0.014$), as the 95% confidence intervals for the indirect effect included zero, (−0.181 to 0.223). This finding suggests that the proposed model of distress as a mechanism of the meaning-repetitive negative thinking relation may be more valid than a model in which meaning acts a mechanism of the relation between psychological distress and repetitive negative thinking.

Discussion

In sum, these results are consistent with our hypothesis that individuals with greater perceived meaning in life are less likely to ruminate about negative experiences, in part, because they have less psychological distress. Further, the relation between life meaning and these cognitive and affective variables were maintained when controlling for relationship quality. Given that relationship quality has been shown to be inversely related with negative affect variables in previous research

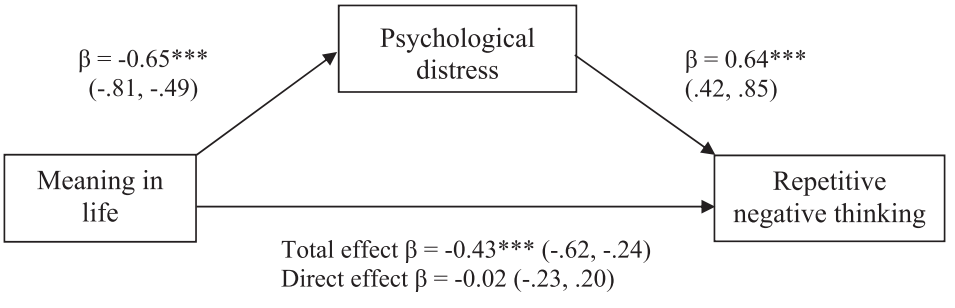

Figure 1. Study 1 model of the indirect effect of meaning in life on repetitive negative thinking through psychological distress. Coefficients represent standardized coefficients and 95% Confidence Intervals noted in parentheses. *$p < .05$. **$p < .01$. ***$p < .001$.

(Friedman & Ryff, 2012; Ryff & Keyes, 1995) as well as in the current study, the partial correlation findings suggest that there is something specific to purpose that may lead to less distress and repetitive negative thinking. The results support and extend previous findings that life meaning is inversely related with rumination related to depression (Boyraz & Efstathiou, 2011; Steger et al., 2008) and specific aversive events (Groleau et al., 2013; Triplett et al., 2012) by showing an inverse relation with a more general, transdiagnostic measure of repetitive negative thinking. The current results also extend previous findings by showing that the relation between life meaning and repetitive negative thinking is mediated by psychological distress. Though the current results are informative, the study's cross-sectional design limits the ability to make inferences about the direction of the relations between the variables. Although we expect that greater life meaning causes less repetitive negative thinking, it is possible that the relation occurs in the opposite direction. Study 2 provides more information about the direction of effects by using a longitudinal study design.

Study 2

Study 2 examined the relation between baseline life meaning and repetitive, intrusive thoughts related to a subsequent flood that threatened to inundate participants' city of residence. This design allows Study 2 to extend the results of previous research on life meaning and trauma-related repetitive negative thinking (Groleau et al., 2013; Triplett et al., 2012) in several ways. First, in contrast to the Groleau et al. and Triplett et al. studies which used a cross-sectional design, Study 2 uses a longitudinal design to examine whether life meaning prospectively predicts stressor-related repetitive thinking. Additionally, Study 2 included a baseline measure of trauma-related repetitive negative thinking, thus allowing us to examine whether life meaning would predict future repetitive negative thinking while controlling for baseline repetitive negative thinking. Second, the current study included a baseline measure of optimism. We chose optimism as a control variable for several reasons, including that life meaning and optimism both involve a positive orientation to the future, that optimism is inversely related to rumination and anxiety (Sweeny & Andrews, 2014), and that previous research has compared the incremental predictive validity of optimism and meaning (Stanculescu, 2016). We predicted that life meaning would be inversely related to flood-related intrusive thoughts and that this relation would be maintained when controlling both for trait repetitive negative thinking and for trait optimism.

Materials and methods

Participants

One hundred and forty undergraduate students at a North American university volunteered to participate as partial fulfillment of a class requirement. The study was approved by the psychology department Institutional Review Board. Eighty-two participants returned for the follow up session (M_{age} = 19.48 years, SD_{age} = 2.41). This sample resulted in a power of .87 to detect a medium effect size relation. These participants were primarily male (n = 49) and self-reported White (non-Hispanic) ethnicity (n = 75).

Measures

Meaning in life. Life meaning was assessed with the Presence of Meaning scale from the Meaning in Life Questionnaire (Steger et al., 2006). The Presence of Meaning scale consists of five items (e.g., "I have discovered a satisfying life purpose"; "I understand my life's meaning") using a scale ranging from 1 (*Absolutely untrue*) to 7 (*Absolutely true*). The scale demonstrated strong internal consistency (α = .87).

Optimism. Optimism was assessed with the Life Orientation Test (Scheier et al., 1994). The scale consists of six items (e.g., "In uncertain times, I usually expect the best.") and four fillers (e.g., "I enjoy my

friends a lot.") that are rated on a scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). The scale demonstrated good internal consistency ($\alpha = .75$).

Baseline stress-related intrusions. Individual differences in baseline intrusive thoughts regarding life stressors was assessed with the intrusion items from the PTSD checklist (Blanchard et al., 1996; Weathers et al., 1993). The PTSD checklist assesses the extent to which previous life stressors cause various symptoms from the DSM-IV (American Psychiatric Association, 1994), using a scale ranging from 1 (*Not at all*) to 5 (*Extremely*). The intrusion items include "Repeated, disturbing memories, thoughts, or images of a stressful experience from the past," "Repeated, disturbing dreams of a stressful experience from the past," and "Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?" The aggregate of these items demonstrated good internal consistency ($\alpha = .79$).

Flood-related intrusions. Distressing intrusive thoughts were assessed with the Intrusion subscale of the Impact of Events Scale – Revised (Weiss & Marmar, 1997), modified to assess intrusions related to the flood. This scale consists of eight items to assess distress regarding flood-related intrusions over the previous three weeks (e.g., "In regard to the flood, I thought about it when I didn't mean to."), using a scale ranging from 0 (*Not at all*) to 4 (*Extremely*). The Intrusions scale demonstrated strong internal consistency ($\alpha = .88$).

Procedure

The study consisted of two sessions. The first session was run between March 28 and April 1, 2011, which is approximately one and a half weeks before the river crested on April 10. The second session was run between May 2 and May 6, 2011, approximately three weeks after the river crested. In session 1, participants completed assessment procedures in groups consisting of one to four participants seated in private workstations. After signing an informed consent form, participants completed a packet of measures that included demographics, meaning in life and optimism. In session 2, participants completed the measure of flood-related intrusions. Participants were then debriefed.

Results

Missing data

The substantial attrition prompted us to explore various analytic approaches. We first examined whether bias is likely to exist in the dataset of completers. In order to test whether baseline variables were related to attrition, we created a dummy variable for return to the follow up session. We then examined whether participants who returned differed from those who did not with a chi-square test for sex and *t*-tests for age and baseline measures of life meaning, optimism, and stress-related intrusions. The results indicated no statistically significant difference between those who returned and those who did not, p's $> .16$. These results indicate a low likelihood of potential bias from using listwise deletion for these cases (Allison, 2001; Howell, 2007). We also performed a sensitivity analysis (see below) by using multiple imputation for our main analyses that life meaning would be inversely related to flood-related repetitive negative thinking, even when controlling for baseline measures of optimism and stress-related intrusions.

Correlation analyses

The idea that life meaning may protect the individual from stressor-related intrusions was examined with correlational analyses between baseline life meaning with both baseline and follow-up intrusion measures. Regarding baseline intrusions, bivariate correlation analyses showed both life meaning and optimism were inversely related to stressor-related intrusions assessed at baseline (see Table 2). As life meaning and optimism showed a positive correlation, a partial correlation was conducted to examine whether life meaning showed incremental predictive validity. The analysis showed that life meaning continued to predict baseline intrusions when controlling for optimism, $pr(79) = -.255$,

Table 2. Bivariate correlations among Study 2 variables ($N = 82$).

Variable	*Mean*	*SD*	1	2	3
1. Meaning in life	4.74	1.23	–		
95% CI					
2. Optimism	3.43	0.70	.26*	–	
95% CI			(.04, .47)		
3. Baseline intrusions	1.97	0.83	−.33**	−.40**	–
95% CI			(−.54, −.12)	(−.61, −.20)	
4. Flood-related intrusions	2.13	3.49	−.36**	−.13	.41***
95% CI			(−.57, −.15)	(−.35, .09)	(.21, .61)

*$p < .05$. **$p < .01$. ***$p < .001$.

$p = .022$, providing evidence that the benefits of life meaning are not simply due to a positive orientation toward the future.

Regarding flood-related intrusions, bivariate correlation analyses also showed that life meaning (but not optimism) assessed at session 1 was inversely related with flood-related intrusions reported at session 2 with a medium effect size. We assessed whether life meaning would show incremental validity in predicting flood-related intrusions while controlling for optimism and baseline individual differences in stressor-related intrusions. This was examined with a regression of flood intrusions on the baseline measures of life meaning, optimism, and stressor-related intrusions, all of which were simultaneously entered as predictors. The results indicated statistical significance of the model, $F(3, 78) = 7.807$, $p < .001$. The results further showed that life meaning continued to predict flood-related intrusions, $\beta = -.26$, $t = -2.472$, $p = .016$, as did individual differences in stressor-related intrusions $\beta = .36$, $t = 3.188$, $p = .002$. However, baseline optimism did not show a significant relation with flood intrusions, $\beta = .08$, $t = 0.747$, $p = .457$. These results support the idea that life meaning can protect the individual from stressor-related repetitive, intrusive thoughts as indicated in Steger et al. (2008) and Study 1.

Sensitivity analyses

Given the large amount of missing data, we performed a sensitivity analysis by using multiple imputation. We included the following variables in the imputation model: the baseline measures of life meaning, optimism, and stress-related intrusion, and the follow-up measure of flood-related intrusions. We followed the recommendation to use 40 imputations when there is approximately 50% of data missing (Graham et al., 2007). The pooled results were the same as the results of completers, with a bivariate correlation between life meaning and flood-related intrusions of −.31 (vs. −.36 in completers), and partial correlations of the life meaning-flood-related intrusions relation when controlling for baseline optimism of −.32 (vs. −.34 for completers) and when controlling for baseline stress-related intrusions of −.28 (vs. −.26 for completers). In sum, these results support the findings from the dataset of completers.

Post-hoc analyses on participants directly influenced by flood

At session 2, participants were asked "Were you, your family members, or any close friends directly impacted by the flood?" (with a yes/no response option) and were asked to explain how they had been impacted. Twenty-one participants indicated they had been directly impacted, with responses such as "Our house was flooded" and "Our house is surrounded by water and we have to canoe to get in and out of our house." Post-hoc analyses indicated the following results. First, compared to participants who reported not being directly impacted by the flood (1.492, $SE = .427$), participants who reported being directly impacted by the flood reported more flood-related intrusions (4.00, $SE = .728$), $F(1, 80) = 8.842$, $p = .004$. We examined whether the relation between meaning and flood intrusions would remain for the participants directly impacted by the flood. The inverse bivariate relation between meaning and intrusions remained $r(21) = -.501$, $p = .021$. We next tested whether this relation would remain when controlling for baseline optimism and stressor-related intrusions. This was examined with a regression of flood intrusions on the baseline measures of life meaning,

optimism, and stressor-related intrusions. The results showed that life meaning continued to inversely predict flood intrusions, $\beta = -.501$, $t = -2.259$, $p = .037$. We also examined the relation between meaning and flood intrusions for the group that was not directly impacted by the flood, and the results indicated that the bivariate correlation between meaning and intrusions was statistically significant, $r(61) = -.270$, $p = .035$. A regression of flood intrusions on meaning, optimism and stressor-related intrusions showed that meaning no longer predicted flood intrusions, $\beta = -.090$, $t = -0.734$, $p = .466$.

We next examined whether the relation between meaning and flood-related intrusions was statistically stronger for the group that was directly impacted. This moderator analysis was examined with a regression analysis of flood-related intrusions on baseline life meaning and the flood impact variables entered as Step 1 and a product of the standardized values of meaning and flood impact entered as Step 2. The results indicated that the flood impact variable did not statistically moderate the relation between meaning and intrusions, ($\beta = -.177$, $p = .079$). The same analysis was conducted with baseline optimism and stressor-related intrusions added as predictors in Step 1. The results indicated that when controlling for optimism and baseline intrusions, the life meaning-flood intrusions relation was more strongly related in participants who were directly impacted by the flood, ($\beta = -.223$, $p = .022$).

Discussion

These results support and extend the findings of Study 1 and previous research showing an inverse relation between life meaning and repetitive negative thinking. First, the measures of intrusions used at baseline and follow-up sessions assessed repetitive, intrusive thoughts to trauma-related stressors. The inverse relation between life meaning and these measures further supports the idea that life meaning protects the individual against repetitive negative thinking caused by a wide class of stressors and are in line with previous cross-sectional research (Groleau et al., 2013). Second, in contrast to Study 1 and previous research that has examined general tendency to engage in repetitive negative thinking (Boyraz & Efstathiou, 2011; Steger et al., 2008), the flood-related intrusions measure involves response to a specific stressor. Third, the finding that life meaning prospectively predicted flood-related intrusions when controlling for baseline tendency to experience stressor-related intrusions represents an advance over cross-sectional findings in previous trauma-related repetitive negative thinking (Groleau et al., 2013). And fourth, the findings indicate that life meaning continued to inversely predict stressor-related intrusive thoughts when controlling for dispositional optimism indicates that the relation between life meaning and intrusive thoughts is not simply due to a positive orientation toward the future which underlies both life meaning and optimism, but may be specific to the constructs assessed by life meaning measures. The attrition rate represents a limitation, though the most likely influence is reduced power and greater likelihood of Type II errors (Allison, 2001; Howell, 2007). The finding that the imputed dataset results were almost identical with those of the completers adds further confidence in the completer dataset results. Further, we suspect that many participants did not return because they were dealing with the effects of the flood. As the post-hoc analyses provide some evidence that the relation between life meaning and flood-related intrusions may be especially strong in participants who were directly impacted by the flood (i.e., when controlling for baseline optimism and stressor-related intrusions but not when these variables are omitted from the model), it is possible – though speculative – that the results would be strengthened with the full sample. Building on Study 2, Study 3 provides more experimental control by examining the relation between life meaning and a specific stressor with a single session design.

Study 3

Study 3 examined the relation between baseline life meaning and both cognitive and affective responses regarding the most aversive event participants had experienced in their lives. Like

Study 2, this design assessed response to a particular event. The study extends the design of Study 2 in several ways. First, a measure of event-related distress was included so that we could examine whether life meaning predicts less distress to aversive events and whether event-related distress mediates the life meaning-repetitive negative thinking relation. Second, this study included a measure of general positive affect in order to rule out this variable as an explanation for an inverse relation between life meaning and repetitive negative thinking. We chose positive affect as a control variable because previous research has used it as a control for meaning (Sedikides et al., 2018) and because it has been shown to also be inversely related to psychological distress and repetitive negative thinking (Takano et al., 2013; Watson et al., 1988). And third, Study 3 used a real-time measure of repetitive, intrusive thoughts in contrast to retrospective report in Study 2. Real-time assessments help to limit recall bias involved in retrospective reports (Shiffman et al., 2008). We had the following predictions: life meaning would be inversely related both with affective distress elicited by the aversive event and with repetitive negative thinking, these relations would be maintained when controlling for a general measure of positive affect, and the life meaning-repetitive negative thinking relation would be mediated by the distress associated with thinking about the aversive event.

Materials and methods

Participants

One hundred and twelve undergraduate students at a Dutch university volunteered to participate as partial fulfillment of a class requirement. The study was approved by the psychology department Institutional Review Board. One criterion variable consisted of state repetitive negative thinking regarding a past traumatic event. Four participants reported that the target event was not traumatic (i.e., that they had not been hurt at all by the incident when it occurred, as assessed with a four-point scale ranging from *not hurt* to *a great deal of hurt*) and three participants did not complete this item. Five participants reported English fluency that was below *moderate*. These participants were subsequently omitted from analyses. The final sample of 100 participants had a $M_{age} = 21.74$ years ($SD_{age} = 2.48$) and were primarily female ($n = 68$). This sample resulted in a power of .92 to detect a medium effect size relation.

Measures

Meaning in life. The Presence of Meaning scale from the Meaning in Life Questionnaire (Steger et al., 2006) was used to assess life meaning. The scale demonstrated strong internal consistency in this study ($\alpha = .88$).

Trait positive affect. General positive affect was assessed with a short form version of the Positive and Negative Affect Schedule (Thompson, 2007). The scale assesses the extent to which participants usually experience five positive affect descriptors (alert, inspired, determined, attentive, and active) using a scale ranging from 1 (*Not at all*) to 5 (*A lot/often*). The scale demonstrated good internal consistency ($\alpha = .72$).

State psychological distress. State positive and negative affect were assessed with a single item each, "Right now, I feel positive (negative)," using a scale ranging from 1 (*Not at all*) to 10 (*Very much so*). These items were administered three times in the study. In order to reduce variables included in analyses, the positive item was reverse scored and an aggregate representing psychological distress was created with the mean of the reverse-scored positive affect item and the negative affect item. The Cronbach's alpha for the measure of state distress was adequate at all assessment points, including time 1 ($\alpha = .79$), time 2 ($\alpha = .84$), and time 3 ($\alpha = .73$)

Traumatic event. Using instructions adapted from the expressive writing paradigm (Pennebaker & Chung, 2011), participants were asked to " … write about your very deepest thoughts and feeling about the most traumatic experience of your entire life in which someone did something hurtful to you." Participants were instructed to write continuously for 5 minutes, that they should not worry about spelling or grammar, and that their writing would be confidential.

Event-related repetitive negative thinking. Participants were instructed via the computer that they would have a rest period in which they could relax. After three minutes, participants heard a tone to alert them the rest period was over, after which they reported on ruminative thoughts about the memory event they had previously reported. The questions used a 100 mm visual analogue scale (VAS) with anchors of 0 (*Not at all*) and 100 (*Very often*). The VAS was used to report on the following four items: "During the rest period, how often did you experience images or thoughts of the memory you recalled earlier?," "During the rest period, did you think about the memory event in terms of 'why it occurred'?," "During the rest period, did you think about the memory event in terms of 'wishing it hadn't happened'?," and "During the rest period, how upset (angry, sad) were you about the memory event?" The scale demonstrated good internal consistency ($\alpha = .90$).

Procedure

Participants completed assessment procedures in groups consisting of one to three participants seated in private workstations. The session began with participants reading an information sheet that included details about the protocol, including that they would be asked to think about an unpleasant memory and that they could skip that part of the study or end participation at any time. After providing informed consent, participants completed a packet of measures that included demographics, trait meaning and positive affect, and baseline state distress. Participants were then asked to complete the 5-minute traumatic incident writing task. State distress was assessed again after the writing task. Participants then completed the rest period and assessment of event-related rumination. After this, participants viewed a short humorous film to facilitate affect repair and were again administered the state distress measure. The study was run by graduate students in clinical psychology, who were instructed to pay attention to signs of participant upset. If there were no signs, participants were debriefed (note: no participant showed or verbally expressed signs of marked upset).

Results[2]

Effect of writing and affect repair on distress

The extent to which the trauma writing task represented an aversive event was assessed with a paired-samples *t*-test on the state distress measure. The results showed that compared to baseline distress ($M = 3.33$, $SD = 1.37$), post-writing distress ($M = 5.56$, $SD = 1.99$) increased, $t(99) = 10.56$, $p < .001$, Cohen's $d = 1.08$. These results indicate that the writing task led to large effects in increasing affective distress.

The effect of the affect repair induction (in addition to natural recovery) was also assessed with a paired-samples *t*-test. The results showed that compared to the post-writing assessment point, distress after the affect repair was significantly lower ($M = 3.68$, $SD = 1.52$), $t(99) = 9.54$, $p < .001$, Cohen's $d = 0.97$, representing a large effect size in decrease of distress.

Correlation analyses

We hypothesized that life meaning would be inversely related to post-stressor distress and stressor-related repetitive negative thinking. Bivariate correlation analyses (see Table 3) supported the life meaning-repetitive negative thinking hypothesis and showed that life meaning was inversely related with distress after writing about the aversive event but not with baseline distress. In order

Table 3. Bivariate correlations among Study 3 variables ($N = 100$).

Variable	*Mean*	*SD*	1	2	3	4
1. Meaning in life	4.73	1.30	–			
95% CI						
2. Trait positive affect	3.36	0.64	.32**	–		
95% CI			(.13, .51)			
3. Baseline distress	3.33	1.37	−.17	−.31**	–	
95% CI			(−.37, .03)	(−.50, −.12)		
4. Post-writing distress	5.56	1.99	−.30**	−.03	.25*	–
95% CI			(−.49, −.10)	(−.23, .17)	(.06, .45)	
5. Negative thinking	21.61	24.19	−.23*	−.01	.09	.41***
95% CI			(−.42, −.03)	(−.21, .20)	(−.11, .29)	(.23, .60)

*$p < .05$. **$p < .01$. ***$p < .001$.

to examine whether life meaning predicted distress reactivity to the writing exercise, a partial correlation analysis was conducted in which baseline distress was entered as a covariate. The results showed that controlling for baseline distress, life meaning predicted less post-writing distress, $pr(97) = -.27$, $p = .008$. Trait positive affect did not show a similar relation with the reactivity measure, $pr(97) = .05$, $p = .623$. The relation between life meaning and reactivity remained when controlling for trait positive affect, $pr(96) = -.29$, $p = .004$.

Mediation analyses

We predicted that the relation between life meaning and repetitive negative thinking would be mediated by the distress elicited by the trauma writing task. This analysis was conducted with the PROCESS macro for SPSS (Hayes, 2013). The repetitive negative thinking variable was regressed on life meaning, with post-writing distress (controlling for baseline distress) entered as the proposed mediator. Figure 2 illustrates that repetitive negative thinking was related both to life meaning and increased distress after the writing task and that the relation between life meaning and repetitive negative thinking was reduced when controlling for the increases in distress. A bias-corrected bootstrap 95% confidence interval for the indirect effect ($B = -1.787$) based on 10,000 bootstrap samples did not include zero (−3.784 to −0.239), indicating a model in which the relation between life meaning and repetitive negative thinking is partially accounted for by individual differences in distress after writing about a traumatic event. The total effect reduced from $B = -4.267$, $t = 2.328$, $p = .022$ to a direct effect of $B = -2.48$, $t = 1.395$, $p = .166$. The mediation effects remained when including trait positive affect as a covariate, as the 95% confidence intervals for the indirect effect did not include zero, (−4.289 to −0.379).

Given that Study 3 includes a temporal element in which trait life meaning is assessed before reactivity to an aversive event, inferences regarding the possibility of meaning causally influencing reactivity are stronger than in the cross-sectional design of Study 1. However, the data are correlational

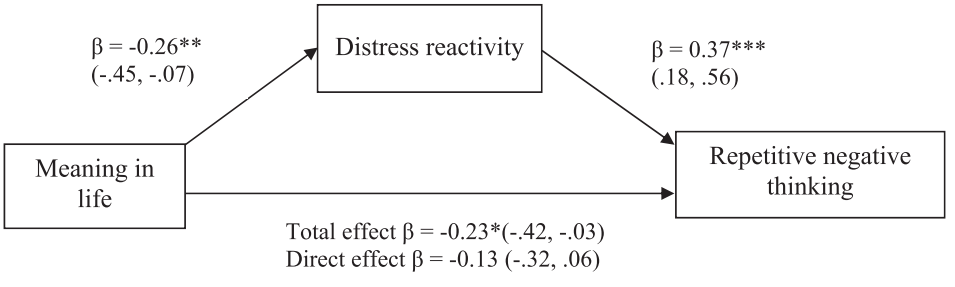

Figure 2. Study 3 model of the indirect effect of meaning in life on rumination through distress reactivity. Coefficients represent standardized coefficients and 95% Confidence Intervals noted in parentheses. *$p < .05$. **$p < .01$. ***$p < .001$.

and causal inferences cannot be made. In order to provide more evidence for the proposed model of reduced distress as a mechanism of a meaning-repetitive negative thinking relation, we conducted a post-hoc mediation analysis to examine whether a model in which the proposed model's predictor (meaning) and proposed mediator (psychological distress) were reversed. The results showed that meaning did not act as a mediator of a distress-repetitive negative thinking relation ($B = 0.841$), as the 95% confidence intervals for the indirect effect included zero, (−0.323 to 2.662). Similar to the findings of Study 1, this result suggests that the proposed model of distress as a mechanism of the meaning-repetitive negative thinking relation may be more valid than a model in which meaning acts a mechanism of the relation between psychological distress and repetitive negative thinking.

Discussion

The results of Study 3 provide support for the findings of Studies 1 and 2. Paralleling the findings of Studies 1 and 2, bivariate correlation analyses showed an inverse relation between baseline life meaning and repetitive negative thinking in response to a stressor. Our hypothesis that a meaningful life would predict less distress after reliving an aversive event was also supported. Specifically, life meaning predicted less distress reactivity in participants after they wrote about the most traumatic event in their lives. Mediation analyses indicated an indirect effect of life meaning on repetitive negative thinking through distress reactivity. That is, the extent to which life meaning is related to less distress after thinking about an aversive event, the less likely the individual will experience repetitive, intrusive thoughts about that stressor. We also found that trait positive affect did not show an inverse relation with either repetitive negative thinking or distress reactivity. Further, controlling for trait positive affect did not significantly influence the life meaning correlation or mediation effects. Although the current findings and previous research show a relation between life meaning and positive affect (Hicks & King, 2009; King et al., 2006), the results of this study suggest that resilience to aversive events may be more a function of meaning than of happiness.

Study 3 extends the designs of Studies 1 and 2 by assessing real-time versus retrospective global reports of stressor-related distress and repetitive negative thinking. Real-time assessments may help to provide a more accurate account of these responses, given that retrospective reports are susceptible to recall biases such as over-reporting the intensity of aversive experiences (Van Den Brink et al., 2001).

There are likely to be limitations regarding the use of a traumatic memory stressor. For example, some participants may have successfully engaged in meaning-making regarding the event in the time since it occurred (Park, 2010). To the extent that participants had recovered from the event, it becomes more difficult to interpret the results as indicating that life meaning protects the individual from initial response to stressors. On the other hand, the traumatic memory method has number of strengths, including that autobiographical recall has shown stronger affect induction effects than other methods (Jallais & Gilet, 2010). More importantly, the validity of our stressor as eliciting event-related psychological distress is supported by findings that the memory task elicited a large effect size change in state distress and that post-memory stressor distress (but not baseline distress) was correlated with repetitive negative thinking about the traumatic event.

General discussion

This research used cross-sectional and prospective designs to examine the idea that life meaning is inversely related to subjective distress and repetitive negative thinking related to aversive events. The cross-sectional findings indicate that life meaning is inversely related both to recent psychological distress and to a transdiagnostic measure of repetitive negative thinking in Study 1 and to a measure of stressor-related repetitive negative thinking in Study 2. Using prospective designs, Study 2 found that baseline life meaning predicts less repetitive negative thinking after a naturalistic aversive event (flood) and Study 3 found that baseline life meaning predicts less subjective distress

and less repetitive negative thinking related to remembering an autobiographical aversive event. Studies 1 and 3 further showed that psychological distress may act as a mechanism of the inverse relation between meaning and repetitive negative thinking. These studies make several contributions to research on the relation between life meaning and response to aversive events.

Contributions

The findings of the current studies support previous research showing an inverse relation between life meaning and both subjective distress (Debats, 1996; Steger et al., 2009) and repetitive negative thinking (Boyraz & Efstathiou, 2011; Steger et al., 2008). One way the current research extends previous work consists of the findings that life meaning continued to predict distress and repetitive negative thinking when controlling for other indices of psychological well-being. Study 1 controlled for positive relationships, which is a key factor (along with purpose) in Ryff's model of psychological well-being (Ryff & Keyes, 1995). Previous research has shown that purpose and positive relations are both inversely related with negative affect variables (Kitamura et al., 2004; Ryff & Keyes, 1995) and that both show incremental validity in predicting outcome variables (Friedman & Ryff, 2012). Study 2 controlled for optimism, which is similar to life meaning in that both involve a positive orientation toward the future. Further, previous research has shown that optimism is inversely related with anxiety and repetitive negative thinking (Sweeny & Andrews, 2014). Study 3 controlled for dispositional positive affect, which has been shown to predict less psychological distress and repetitive negative thinking (Takano et al., 2013; Watson et al., 1988). The significant findings in all three studies remained when controlling for these other measures of general well-being, suggesting that there is something specific to life meaning (e.g., purpose and coherence) that protects against negative affective and cognitive consequences of aversive events. For example, the presence of life meaning may help to (i) relativize threats such that they become less motivationally salient (Emmons, 1999; De Dreu et al., 2009) and (ii) provide a salient focus that draws ruminative attention away from threat-related stimuli (McGregor et al., 2010).

A second contribution is the use of prospective designs in Studies 2 and 3. With rare exceptions (e.g., Schaefer et al., 2013), previous studies have used retrospective designs to examine the relation between dispositional life meaning and distress-related variables. A strength of prospective designs is that compared to retrospective studies, evidence of a temporal covariation between variables provides more support for a possible causal relation (Daya, 2003). A potential causal influence between life meaning and response to aversive events is further supported both by the Study 2 finding that baseline life meaning continued to predict flood-related intrusions when controlling for baseline disposition to experience stressor-related repetitive negative thinking and by the Study 3 finding that baseline life meaning continued to predict subjective distress related to writing about a traumatic event when controlling for baseline distress.

Another contribution of the current research consists of results which suggest the relation between life meaning and repetitive negative thinking may be mediated by subjective distress using cross-sectional (Study 1) and prospective (Study 3) designs. Previous correlation and experimental research noted above has shown that life meaning is inversely related both to repetitive negative thinking and distress. The current studies extend these findings by showing that this inverse life meaning-repetitive negative thinking relation is at least partly explained by subjective distress. These findings support the idea that life meaning inhibits the subjective distress and repetitive negative thinking that accompany aversive events (Peterson, 1999).

Limitations and future directions

The mediation findings in Studies 1 and 3 should be interpreted with caution due to their correlation designs. The results indicated that subjective distress acts as a mediator in that it conceptually "accounts for the relation between the predictor and the criterion" variables (Baron & Kenny, 1986,

p. 1176). However, the direction of the relation cannot be determined due to the correlational nature of the study. At the same time it should be noted that there are analytic and methodological elements that support the proposed model of distress mediating the influence of meaning on repetitive negative thinking. First, the data from both Study 1 and 3 better fit a model in which life meaning is the predictor and psychological distress is the mechanism compared to a model in which distress is the predictor and meaning is the mechanism. Second, the use of a prospective design in Study 3 provides additional evidence for the possibility of causal mediation, as logic dictates that baseline meaning is more likely to influence response to an subsequent aversive event than the other way around. However, the correlational nature of both studies suggests that the mediation results can best be thought of as initial evidence for a model that needs testing in experimental designs.

Current theories suggest that life meaning involves the three elements of purpose, coherence, and significance (George & Park, 2016). The current research provides some evidence that the purpose element may be important in relation to stressors, as the effects in Study 1 were obtained with a dispositional measure of life meaning that focuses on purpose (Ryff, 1989). However, the effects in Studies 2 and 3 were obtained with a dispositional measure that includes items assessing both purpose and coherence (Steger et al., 2006). Additional research is needed to further determine the relative and potentially interactive contributions of purpose, coherence, and significance in relation to dampening stress responses. This research would benefit not only from experimental designs, but also from using new dispositional measures that distinguish between the three elements (George & Park, 2017).

A last limitation of note regards the extent to which the findings will generalize. Although Study 2 examined response to a naturalistic aversive event, the other studies used laboratory methods and all studies used university students as participants. These studies represent a reasoned first step to using laboratory methods to examine processes involved in the psychological distress of everyday life (Zvolensky et al., 2001). We see the next steps as including research that examines life meaning as a protective factor in preventing the development of intense, prolonged distress after naturalistic stressors and also as an intervention for individuals suffering from elevated levels of psychological distress.

The current findings also suggest the need for additional research to advance our understanding of whether and why life meaning may promote resilience against stressor-related distress and repetitive negative thinking. Regarding the question of whether meaning promotes resilience, future research would benefit not only from designs that experimentally induce meaning, but also ones that incorporate a variety of methods to operationalize personally-relevant stressors. The stressors used in the current research have strengths such as the external validity of the city-wide flood stressor in Study 2 and the personal relevance of the trauma memory in Study 3. However, these methods also involve inferential limitations regarding the capacity of life meaning to protect against stressor-related distress and repetitive negative thinking – i.e., the relatively small number of participants who were directly impacted by the flood (Study 2) and the possibility that participants had (partially) recovered from the traumatic event (Study 3). Confidence in the capacity of meaning to provide resilience would be improved by testing the proposed model with additional methods such as using samples that are at risk for experiencing traumatic events (Skogstad et al., 2013) and inducing stress with so-called trauma films – film clips that are aversive enough to elicit responses similar to those experienced after actual traumas, including RNT and negative affect, though not so aversive as to lead to long-lasting effects (see James et al., 2016).

Regarding the question of why meaning may promote resilience, clinical researchers often propose that repair of a traumatic meaning violation involves meaning-making interventions that directly address the aversive event (Park, 2010; Resick & Schnicke, 1992). However, the current research suggests that a general sense of life meaning may also mitigate the psychological effects of aversive events. These results are in line with previous findings that distress from an aversive event can be alleviated by a general sense of life meaning (Schaefer et al., 2013). In order to better understand this relation, future research would benefit from examining whether general life meaning is related to memory representations of aversive events. One potential reason regards

coherence – that is, individuals who have a strong sense of life meaning may be better able to make meaning of specific aversive events, thereby reducing the ruminative "need to keep looking" for coherence (Martin & Tesser, 1996). Such an idea could be tested by examining the relation between general life meaning and the coherence of autobiographical memories about aversive events (Vanderveren et al., 2019).

A second reason regards the potential of a meaningful life to relativize aversive events. Values and goals that contribute to life meaning (purpose) are often abstract and may thereby elicit the sort of high-level construal mode of information processing that has been shown to be associated with resilience to meaning violations (De Dreu et al., 2009). Future research would benefit by categorizing the abstractness of life goals (e.g., systems of Carver & Scheier, 1998; DeShon & Gillespie, 2005) and examining whether abstractness is related to greater resilience to aversive events.

A third reason regards the motivational salience of valued goals – that is, the extent to which life meaning-related stimuli are motivationally salient, they should draw attention away from cues of a relatively less salient aversive event (McGregor et al., 2010). This idea is supported by recent findings that a brief meaning intervention reduced attentional bias towards alcohol-related stimuli (Ostafin & Feyel, 2019). Future research could test this potential mechanism by using attentional bias tasks to examine the extent to which stimuli related to valued life goals are better able to capture and hold attention compared to stimuli related to an aversive event.

Conclusions

In sum, the present research contributes to developing an understanding of the relation between life meaning and response to stressors. The majority of previous work has used cross-sectional designs to examine the relation between life meaning and both distress and repetitive negative thinking (Boyraz & Efstathiou, 2011; Debats, 1996; Groleau et al., 2013; Steger et al., 2009). The current research extends this work through the use of prospective designs to examine response to laboratory and naturalistic stressors, by demonstrating that the effects of life meaning are not simply due to general well-being, and by providing evidence that an inverse relation between life meaning and repetitive negative thinking may be mediated by subjective distress. Overall, the results of this research supports the observation of Nietzsche (1889/2005) that "If you have your '*why?*' in life, you can get along with almost any '*how?*'"

Notes

1. Each of the DASS subscales showed similar mediation effects, as the 95% confidence intervals for the indirect effect did not include zero for the anxiety (−0.364, −0.091), stress (−0.298, −0.101), or depression (−0.491, −0.184) subscales.
2. We followed the suggestion of an anonymous reviewer to also examine the hypotheses when controlling for how traumatic the event was for participants. The analyses indicated that the results of the hypotheses did not substantially change when adding this control variable (i.e., there were no changes from statistically significant to non-significant).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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