Available online at www.sciencedirect.com

ScienceDirect

Behavior Therapy 53 (2022) 793–806

Behavior Therapy

www.elsevier.com/locate/bt

Reciprocal Relations of Worry, Rumination, and Psychopathology Symptoms After Loss: A Prospective Cohort Study

Maarten C. Eisma
University of Groningen

Asuman Buyukcan-Tetik
Sabanci University

Paul A. Boelen
Utrecht University and ARQ Psychotrauma Expert Group

Bereavement can precipitate symptoms of depression, prolonged grief disorder, and posttraumatic stress disorder. Targeting repetitive negative thought (i.e., worry, rumination) in treatment may help reduce post-loss psychopathology. Yet, evidence on longitudinal associations of depressive rumination and worry with post-loss psychopathology symptoms has been mixed and the directions of effects are still unclear. Recently bereaved adults (78% female) completed questionnaires assessing depressive rumination (brooding), worry, and depression, prolonged grief and posttraumatic stress symptoms 11 times in 1.5 month intervals. We applied random-intercept cross-lagged panel models (RICLPMs) to examine reciprocal within-person associations between worry and psychopathology symptoms, between rumination and these symptoms, and between worry and rumination. Main findings were that worry showed reciprocal relationships with psychopathology symptoms (although worry did not consistently predict prolonged grief symptoms). Depressive rumination was predicted by psychopathology symptoms, but not vice versa. Worry showed reciprocal relations with depressive rumination. Findings suggest that worry may be part of a downward spiral, enhancing psychopathology symptoms following loss, whereas depressive rumination is solely a consequence of such symptoms.

Address correspondence to Dr. Maarten Eisma, Department of Clinical Psychology and Experimental Psychopathology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands. e-mail: m.c.eisma@rug.nl.

Keywords: grief; repetitive negative thinking; perseverative cognition; longitudinal; cross-lagged

Bereavement is a major stressful life event, which can precipitate psychopathology in a significant minority, including depression, posttraumatic stress disorder (PTSD), and prolonged grief disorder (PGD; Prigerson et al., 2021; Zisook et al., 2014). PGD is a disorder characterized by persistent, distressing, and disabling grief and is newly included in the forthcoming eleventh edition of the International Classification of Diseases (ICD-11; World Health Organization, 2018) and the text revision of the fifth *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR; American Psychiatric Association, 2020). Effective treatments for prolonged grief symptoms and related health problems have been developed, yet these generally only alleviate the suffering of half of all patients (e.g., Boelen et al., 2007; Shear et al., 2005; for reviews: Doering & Eisma, 2016; Johannsen et al., 2019). Knowledge on changeable determinants of psychological outcomes of bereavement may help improve treatments for distressed bereaved people. Accordingly, grief researchers have aimed to clarify these determinants (for a review: Eisma & Stroebe, 2021).

One important changeable determinant of mental disorders is repetitive thought, defined as the process of thinking attentively, repetitively, or frequently about oneself or one's world (Segerstrom

et al., 2003). Repetitive negative thought, i.e., repetitive thought focused on negative events or emotions, is considered a transdiagnostic risk factor of psychopathology (Ehring & Watkins, 2008). Most commonly, it is conceptualized as worry (predominantly verbal repetitive thought about uncertain future events with potential negative outcomes; Borkovec et al., 1998) or depressive rumination (repetitively and passively focusing on the nature, causes, and consequences of one's low mood; Nolen-Hoeksema et al., 2008). These cognitive processes relate to mood and anxiety disorders, such as depression and generalized anxiety disorder, as well as stress-related disorders, including PTSD and PGD (Eisma & Stroebe, 2021; Moulds et al., 2020; Nolen-Hoeksema et al., 2008; Olatunji et al., 2013). Systematic reviews and meta-analyses have demonstrated that treatments targeting worry and rumination are effective in reducing psychopathology (e.g., Querstret & Cropley, 2013) and pilot randomized controlled trials demonstrate that such treatments may also reduce loss-related psychopathology (e.g., Eisma et al., 2015; Wenn et al., 2019). Nevertheless, it is yet unclear what the temporal relationships are between depressive rumination, worry, and commonly observed symptoms of post-loss psychopathology. This precludes conclusions on what types of repetitive negative thought are risk factors for poor psychological adaptation to loss.

Below, we will review theoretical mechanisms proposed to underlie temporal associations between rumination, worry, and symptoms of psychopathology and summarize results from longitudinal surveys among bereaved samples. Subsequently, we discuss three major limitations of prior survey research (no consideration of within-person effects, of reciprocal relations between repetitive thought and symptoms of psychopathology, and of the reciprocal relations between worry and rumination). We will explain how we addressed these limitations in the present, multi-wave cohort survey study applying random intercept cross-lagged panel models (Hamaker et al., 2015; Orth et al., 2021).

DEPRESSIVE RUMINATION AND POST-LOSS PSYCHOPATHOLOGY

Nolen-Hoeksema and colleagues conducted the first series of large-scale studies into depressive rumination in bereaved persons in the 1990s (Nolen-Hoeksema et al., 1994, 1997; Nolen-Hoeksema & Davis, 1999; for a review: Nolen-Hoeksema et al., 2008). According to Nolen-Hoeksema's Response Styles Theory (RST), negative affect elicits rumination, which is considered a maladaptive strategy to understand one's depressive symptoms (Nolen-Hoeksema et al., 2008). In brief, the RST holds that rumination exacerbates depression by (a) increasing the accessibility of negative cognitions about the self, the world, and the future, (b) making problem-solving less effective, (c) reducing instrumental behavior, and (d) driving away social support. The tenets of the RST have received support in research in clinical and nonclinical samples (Nolen-Hoeksema et al., 2008), and, to a lesser extent, from research in bereaved samples (e.g., Eisma, et al., 2020; Nolen-Hoeksema & Davis, 1999).

Importantly for present purposes, studies have demonstrated positive concurrent associations between depressive rumination and depressive, prolonged grief and posttraumatic stress symptoms in bereaved samples (e.g., Boelen & Lenferink, 2020; Eisma et al., 2020; Ito et al., 2003; Nolen-Hoeksema et al., 1994, 1997). However, longitudinal surveys have yielded mixed findings. In a classic longitudinal cohort survey study of 253 bereaved adults, more depressive rumination 1 month after bereavement predicted higher levels of depression 5 months later, over and above baseline depressive symptoms and social support (Nolen-Hoeksema et al., 1994). However, three recent longitudinal surveys among bereaved adults showed that depressive rumination did not predict depressive, prolonged grief and posttraumatic stress symptoms over varying time periods while controlling for baseline symptoms (Boelen et al., 2016; Eisma et al., 2012, 2015). It should be noted that these newer studies showed some similarities to Nolen-Hoeksema et al.'s (1994) work. The studies had comparable sample sizes and samples consisted of adult, predominantly female participants who had experienced losses due to varying causes. However, they also differed in key respects. Specifically, the newer studies were not cohort studies and used the brooding subscale of the Ruminative Response Scale (RRS), instead of the RRS, because the latter has been criticized for content overlap with depressive symptoms (Treynor et al., 2003). Due to these mixed findings and methodological differences, it is yet unclear if depressive rumination affects commonly experienced emotional problems after bereavement.

WORRY AND POST-LOSS PSYCHOPATHOLOGY

While rumination has historically been the focal point for grief researchers interested in repetitive thought, there is increasing interest in another frequently studied repetitive thought style: worry). Worry, like rumination, consists of negative,

abstract, repetitive thought (Watkins, 2008). However, it is distinct in motivation (i.e., focused on preventing negative events instead of understanding negative experiences) and temporal focus (focused on the future instead of the past; for a comparison: Nolen-Hoeksema et al., 2008). A classic theory holds that worry acts as a cognitive avoidance strategy by reducing the accessibility of affect-laden imagery, which exacerbates affective disturbances (Borkovec et al., 1998). It has been hypothesized that the uncertainties associated with bereavement (e.g., life changes, role changes, suffering of family members) could elicit worries after bereavement. In turn, severe and persistent worry about such topics could hamper the emotional processing of painful memories related to the loss, leading to the persistence of post-loss psychopathology symptoms (Eisma et al., 2017, 2020).

In line with these theoretical notions, worry has shown positive concurrent associations with loss-related avoidance and anxiety, depression and prolonged grief symptoms (e.g., Boelen, 2010; Eisma et al., 2020). However, two longitudinal studies yielded conflicting findings on the relationship between worry and post-loss distress. Eisma et al. (2017) demonstrated that worry predicted anxiety, depression, and prolonged grief symptoms over a 6-month period, while controlling for baseline symptoms. However, Boelen et al. (2016) did not find that worry predicted depression, prolonged grief, and posttraumatic stress symptoms over the same period while controlling for baseline symptoms.

LIMITATIONS OF PRIOR LONGITUDINAL STUDIES

A first limitation of previous longitudinal studies is that they employed traditional lagged models, which do not clearly show whether the results are due to between-person effects, within-person effects, or a mixture of both (Hamaker et al., 2015). The associations between the same variables at between- and within-levels, however, do not always match in terms of magnitude and statistical significance (e.g., Keijsers, 2016). This problem hampers the examination of the direction of the association between repetitive thought and psychopathology, and thus the identification of targets for preventative and curative treatments. While both repetitive thought and psychopathology symptoms have stable trait-like components (i.e., individual differences), people may experience some deviations from their usual levels (i.e., increases and decreases) across time. In this study, we investigated the differential roles of both of these between-person and within-person effects in repetitive thought and post-loss psychopathology controlling for the shared variance between effects.

A second limitation of prior longitudinal studies is that they have not accounted for the fact that repetitive negative thought can be both a cause and consequence of affective disturbances. For example, the RST holds that negative emotions (common to affective and stress-related disorders) elicit ruminative thought, which, in turn, leads to more affective disturbances via a variety of mechanisms, resulting in a downward spiral (Nolen-Hoeksema et al., 2008; cf. Watkins & Roberts, 2020). Indeed, prior studies in other areas have provided some evidence that repetitive negative thought may be both a cause and consequence of emotional distress (e.g., Everaert & Joorman, 2020; Nolen-Hoeksema et al., 2007). Clarifying such associations among the bereaved could offer clues for treatment development. For example, the existence of reciprocal associations between rumination and depression would suggest that both rumination-focused treatments and treatments aimed at reducing negative mood could be effective in targeting repetitive thought and post-loss depressive symptoms (cf. Eisma et al., 2015; Papa et al., 2013).

A third limitation of prior research is that despite demonstrating concurrent associations of worry and rumination (Eisma et al., 2020), it has not been clarified how these processes mutually influence each other in bereaved persons. However, it is conceivable that depressive rumination about the causes and consequences of loss-related distress would elicit worries about future loss-related stressors, and vice-versa (cf. Anyan et al., 2020). The direction of such effects may provide insight into which type of repetitive negative thought one should specifically target in treatment for severely distressed bereaved people.

THE CURRENT STUDY

The main aims of the present longitudinal cohort survey study are to test the hypotheses that depressive rumination and worry have reciprocal relationships with loss-related psychopathology severity (i.e., depression, prolonged grief, and posttraumatic stress symptoms). Moreover, we tested the hypothesis that depressive rumination and worry mutually affect each other over time. To address key limitations of prior research, we set out to examine the within-person associations between these variables using random-intercept cross-lagged panel models (RICLPMs).

Method

PROCEDURE

Data were gathered in the context of a large research project studying cognitive behavioral correlates of different emotional problems after bereavement, called the Utrecht Longitudinal Study on Adjustment to Loss (for further details see: Eisma et al., 2020). Participants were recruited via announcements on different internet websites and online platforms providing information about grief and bereavement care to different bereaved audiences (including ones from nonprofit bereavement care organizations and funeral companies). The announcements explained the aims of the project and invited adults (i.e., 18 years and older) who had lost a relative or a friend to participate. After completing an online application form, participants received a personal login code and were referred to a secure website where more information about the study was provided. Subsequent to providing informed consent, participants could complete the first questionnaire. Participants who had experienced their loss within the past year were asked if they were willing to complete additional questionnaires. Those willing to do so were sent an automated email that included a link to an online follow-up questionnaire for 10 times, every 6 weeks. Follow-up questionnaires were accessible for 7 days, after the email invitation, in order to keep the intervals between completed follow-up measures similar for all participants. We sent no additional reminders. Participants received no money or other incentives to complete the questionnaires. Recruitment took place between early 2012 and late 2020. In the period of data collection, 2,104 people completed an application form, 1,170 (56%) of whom completed the questionnaires. For the current study, we selected people who experienced their loss in the previous year and were invited for follow-up measures, yielding a sample of $N = 426$.

PARTICIPANT CHARACTERISTICS

Table 1 shows the baseline sample characteristics of the 426 participants (78% female). The mean age of participants was 53.67 years (SD = 14.28). Most had lost a partner, 45%, or a parent, 35%, on average 4.82 months ago (SD = 2.98 months). Because all first assessments were conducted at different points in time (within 12 months from loss) the available data encompassed a time range varying from 1 month to over 2 years across time-points.

Table 1
Demographic and Loss-Related Characteristics of the Sample ($N = 426$)

Demographic characteristics	
Gender (Valid *N* (%))	
Male	94 (22)
Female	332 (78)
Age in years (*M* (*SD*))	53.67 (14.28)
Education level (Valid *N* (%))	
College/University	246 (58)
Lower than college/university	180 (42)
Loss characteristics	
Time since loss in months (*M* (*SD*))	4.82 (2.98)
Deceased person is (Valid *N* (%))	
Partner	192 (45)
Child	35 (8)
Sibling	21 (5)
Parent	149 (35)
Other	29 (7)
Cause of death is (Valid *N* (%))	
Illness longer than one month	194 (46)
Illness shorter than one month	39 (9)
Accident	9 (2)
Suicide	25 (6)
At birth	6 (1)
Unexpected medical cause	89 (21)
Other cause	64 (15)
Death was (Valid *N* (%))	
Non-violent	389 (91)
Violent (suicide, accident, homicide)	37 (9)

INSTRUMENTS

A self-constructed questionnaire was used to assess sociodemographic characteristics (gender, age, education level) and loss-related characteristics (time since loss in months, relationship with the deceased, cause of death).

Worry was measured with an abbreviated 8-item version of the original Penn State Worry Questionnaire (PSWQ-A; Hopko et al., 2003; Dutch version: Boelen et al., 2016). We adapted the instructions slightly so that participants were asked to indicate how typical certain behaviors were over the past period (instead of how typical these behaviors were in general) on a 5-point scale (from 1 = "not at all typical of me" to 5 = "very typical of me"). Higher average scores indicate stronger worry tendencies. At baseline, the PSWQ-A showed excellent reliability, $\alpha = .94$ (range across study waves: .94–.96; see Appendix A for reliabilities of all scales at each study wave).

Depressive rumination was assessed with the 5-item brooding subscale of the Ruminative Response Scale of the Response Styles Questionnaire (RRS-RSQ: Nolen-Hoeksema & Morrow,

1991) as it is proposed to show no content overlap with scales that assess depressive symptoms (Treynor et al. 2003; Dutch version: Schoofs et al., 2010). To assess brooding every 6 weeks, we adapted the instructions of the scale. Specifically, participants were asked how often they exhibit certain behavior if they feel sad, blue, or depressed over the past month on a four-point scale (from 1 = "almost never" to 4 = "almost always"). The reliability of the brooding scale was adequate at baseline, α = .78 (range across study waves: .78–.86).

Depressive symptoms were assessed with the 7-item depression subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; Dutch version: Spinhoven et al., 1997). Participants rated the extent to which they experienced certain symptoms in the last week on a 4-point scale ranging from 1 to 4 (varying anchors). The depression subscale of the HADS has good psychometric properties (Bjelland et al., 2002). In the baseline sample, internal consistency was excellent, α = .93 (range across study waves: .88–.93).

Prolonged grief symptoms were measured using 11 items of the Prolonged Grief Disorder Scale (PGD Scale: Boelen, 2012). This scale is based on an earlier diagnostic proposal of Prigerson et al. (2009) for PGD. It contains items on cognitive/emotional symptoms, separation distress, and functional impairment. Participants rate the frequency of occurrence of symptoms over the past month on a 5-point scale (from 1 = "never" to 5 = "always"). The average score represents prolonged grief symptom severity. The reliability of the PGD scale was excellent at baseline, α = .93 (range across study waves: .92–.94).

Posttraumatic stress symptoms were assessed with the PTSD Symptom Scale Self-Report version (PSS-SR), a 17-item measure of posttraumatic stress symptoms per criteria from the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). Participants rate the frequency of experiencing symptoms during the preceding month on 4-point scales (from 1 = "not at all" to 4 = "five/more times per week/almost always"). The index event was defined as "the death of your loved one" (e.g., "How often did you have unpleasant dreams or nightmares about the death of your loved one?"). Good psychometric properties of the PSS-SR have been reported in English (Foa et al., 1997) and Dutch samples (Engelhard et al., 2007). Internal consistency was excellent at baseline, α = .90 (range across study waves: .87–.90).

STATISTICAL ANALYSES

To examine longitudinal bidirectional effects, we used random intercept cross-lagged panel models (RICLPM; Hamaker et al., 2015; Keijsers, 2016). Extending the traditional cross-lagged panel model analysis, which investigates the associations between variables at the between-person level, the RICLPM examines bidirectional associations between two variables at the within-person level while controlling for the between-person differences and stability paths.

A recent study has shown that RICLPMs have a better fit and fewer convergence problems compared to traditional cross-lagged panel models (Orth et al., 2021). RICLPMs show cross-lagged associations between the deviations from the usual level. Thus, the RICLPM is especially suitable when the time intervals between assessments are not long enough to observe permanent changes in variables (Orth et al., 2021). Given that the time interval between assessments is relatively short (1.5 months) in this study, we used RICLPMs as our main models and relied on their results in our interpretations. However, we also ran traditional cross-lagged panel model (CLPM) analyses reported in supplementary materials only (see Appendix B).

We first computed the percentage of variance at the within-person level for all variables: 18% for worry, 28% for depressive rumination, 19% for depressive symptoms, 18% for prolonged grief symptoms, and 18% for posttraumatic stress symptoms. These results show that, although most of the variance in these variables was due to individual differences (i.e., stable trait-like components), there was still a considerable amount of variance due to fluctuations in these variables across study waves.

In our RICLPMs (see Figure 1, Appendix C), we estimated latent variables at the between-person level using scores at all 11 study waves and constraining their loadings to 1. These between-person level estimates represented the stable trait-like components of the variables. We included the association between the between-person differences in our variables in each model. To estimate within-person variations, assessments at each wave were regressed onto separate latent variables while constraining their loadings to 1. Within-person variations represented the deviations from the usual level. At the within-person level, we added stability paths (i.e., autoregressive paths), cross-lagged paths, correlation at the first assessment wave (T1), and within-wave error correlations. We dealt with missing data using the full information maximum likelihood estimation with

robust standard errors (i.e., MLR) in Mplus Version 8 (Allison, 2003; Enders & Bandalos, 2001; Muthén & Muthén, 1998-2017) that is shown to be able to handle even large proportions of missing data (Johnson & Young, 2011).

In our RICLPMs, we tested whether stability paths, cross-lagged paths, and within-wave correlations could be constrained to be equal across waves using chi-square difference tests. In these model comparison tests, we used the unconditional RICLPM model without any constraints as the base model (see Appendix D for model comparisons). We followed these steps for seven bidirectional and longitudinal associations: (a) worry and three psychopathology indicators (depressive symptoms, prolonged grief symptoms, and posttraumatic stress symptoms), (b) depressive rumination and three psychopathology indicators, (c) worry and depressive rumination, and then reported the results of the best-fitting models. All final models an RMSEA lower than .04 and a CFI higher than .97 (see Appendix D for all fit statistics).

Results

DESCRIPTIVE STATISTICS, CORRELATIONS AND PSYCHOPATHOLOGY LEVELS

We present the descriptive statistics of and correlations between study variables in Table 2 based on all scores across all 11 waves. These results showed that all variables had significant moderate-to-strong associations with each other. We also present descriptive statistics and correlations at each study wave separately in Appendix A.

At baseline, mean item scores covered the full range for nearly all scales. Twenty-five percent of participants scored above an established threshold for probable depression (Bjelland et al., 2002), and 55% of participants scored above an established threshold for probable PTSD (Coffey et al., 2006). Notably, the latter cut-off has limited sensitivity, so the true number of PTSD cases is likely lower. The sample can best be described as subclinical.

MISSING DATA

Most participants did not show a consistent pattern in filling in the surveys across study waves, but instead had an on-again/off-again type of participation (e.g., filled in the surveys in the first three waves, then left for two waves, then filled in the surveys for four waves, and left again for the last two waves). Thus, some dropped-out participants at one wave were active participants in another wave. The mean number of completed surveys per participant was 5.20 (SD = 3.90, range = 1–11). Out of the 426 participants in the first wave, only 55 participants filled in the surveys across all 11 study waves. Sample sizes at each wave, however, varied between 149 and 426 (a list of participant numbers across waves can be found in Appendix A). People who filled in only some of the surveys (n = 371) had significantly higher levels of worry, ΔM = .36, $t(424)$ = 2.34, p = .02, and depressive rumination, ΔM = .23, $t(424)$ = 2.51, p = .01, than people who filled in all 11 surveys (n = 55). Nevertheless, there was no significant difference between these two groups on depressive symptoms, ΔM = -.62, $t(424)$ = -.62, p = .54, prolonged grief symptoms, ΔM = .06, $t(424)$ = .44, p = .66, or posttraumatic stress symptoms, ΔM = -.27, $t(424)$ = -.39, p = .70. Thus, participants who completed only some study waves did not appear to differ in their psychopathology severity from completers.

Since dropout took place especially after the first study wave, in further analyses, we examined whether participants who filled in the survey only at the first study wave (n = 138) differed from the participants who continued to participate in our longitudinal study after the first study wave (i.e., filled in the survey at least once more, n = 288). Although participants who left the study after the first wave had slightly higher levels of worry and depressive rumination at the first study wave than the participants who remained in the study, the difference was not significant, ΔM for worry = .19, $t(424)$ = 1.76, p = .08, and, ΔM for depressive rumination = .11, $t(424)$ = 1.71, p = .09. Sim-

Table 2
Descriptive Statistics and Correlations Across 11 Study Waves

Variable		*N*	*M*	*SD*	1	2	3	4	5
1	Worry	2,217	2.41	1.07	-				
2	Depressive rumination	2,226	1.60	0.60	.63	-			
3	Depressive symptoms	2,203	1.82	0.71	.53	.59	-		
4	PG symptoms	2,228	2.28	0.91	.54	.66	.79	-	
5	PTS symptoms	2,206	1.75	0.53	.62	.66	.79	.84	-

Note. *N* is the total number of reported cases across all participants in 11 study waves. All correlations are significant, $p < .001$. PG = prolonged grief. PTS = posttraumatic stress.

ilarly, none of the differences in the comparisons of depressive symptoms, ΔM = -.45, $t(424)$ = -.63, p = .53, prolonged grief symptoms, ΔM = .03, $t(424)$ = .34, p = .74, or posttraumatic stress symptoms, ΔM = .35, $t(424)$ = .68, p = .50, were significant. We also conducted all our random intercept cross-lagged panel model analyses (see below) only with the 288 participants who did not drop out after the first study wave and found identical results.

LONGITUDINAL ANALYSES WITH RICLPMS

Worry and Psychopathology Symptoms

The results (see Table 3) showed that at the between-person level, worry was linked to all three psychopathology indicators. People with higher worry levels also reported higher levels of depressive symptoms, prolonged grief symptoms, and posttraumatic stress symptoms.

Regarding the cross-lagged effects between the within-person variables, any deviation from the usual levels of three psychopathology indicators at a study wave was positively linked with a deviation from the usual level of worry at the next study wave across all study waves. In terms of the opposite effect, while within-person level worry was a constant predictor of within-person level depressive symptoms and posttraumatic stress symptoms across waves, the longitudinal effect of within-person level worry on within-person level prolonged grief symptoms varied across waves. That is, the longitudinal effect of worry on prolonged grief symptoms was significant at some waves, but not at others. Thus, we conducted our comparison tests of bidirectional effects only for depressive symptoms and posttraumatic stress symptoms, and found that the effect of depressive symptoms/ posttraumatic stress symptoms on worry was stronger than the effect of worry on depressive symptoms/ posttraumatic stress symptoms (Wald = 10.21, df = 1, p = .001 for depressive symptoms, Wald = 35.48, df = 1, p < .001 for posttraumatic stress symptoms).

Table 3
RICLPMs for the Association Between Worry and Mental Health

	Depressive symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.35**	**.04**	**<.001**	**.57**
Worry (t) –> Mental health indicator (t+1)	**.06**	**.02**	**.01**	**.08 - .13**
Mental health indicator (t) –> Worry (t+1)	**.24**	**.05**	**<.001**	**.12 - .20**
T1 within-person association	**.07**	**.03**	**.02**	**.28**
T2-T11 residual associations	.02 - .08	.01 - .02	.00 - .13	.12 - .20
Autoregressive paths for worry	**.26**	**.04**	**<.001**	**.22 - .31**
Autoregressive paths for mental health indicator	.10 - .58	.07 - .23	.00 - .59	.11 - .65
	PG symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.43**	**.05**	**<.001**	**.57**
Worry (t) –> Mental health indicator (t+1)	-.12 - .21	.06 - .09	.00 - .89	-.19 - .28
Mental health indicator (t) –> Worry (t+1)	**.23**	**.04**	**<.001**	**.15 - .23**
T1 within-person association	**.11**	**.03**	**<.001**	**.35**
T2-T11 residual associations	.01 - .08	.01 - .03	.00 - .44	.07 - .53
Autoregressive paths for worry	**.27**	**.04**	**<.001**	**.23 - .31**
Autoregressive paths for mental health indicator	**.45**	**.04**	**<.001**	**.41 - .57**
	PTS symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.32**	**.03**	**<.001**	**.69**
Worry (t) –> Mental health indicator (t+1)	**.04**	**.02**	**.03**	**.07 - .09**
Mental health indicator (t) –> Worry (t+1)	**.42**	**.07**	**<.001**	**.18 - .26**
T1 within-person association	**.04**	**.02**	**.01**	**.23**
T2-T11 residual associations	**.03**	**.00**	**<.001**	**.32 - .48**
Autoregressive paths for worry	**.23**	**.04**	**<.001**	**.21 - .28**
Autoregressive paths for mental health indicator	**.34**	**.05**	**<.001**	**.30 - .39**

Note. RICLPM = Random intercept cross-lagged panel model. PG = prolonged grief. PTS = posttraumatic stress. Coefficients in bold were the same and constantly significant across study waves. For the remaining non-bold paths, significance varied across study waves. The last column (β/*r*) shows the standardized coefficients for both unidirectional (β; rows 2, 3, 6, and 7 for each variable) and bidirectional (*r*; rows 1, 4, and 5 for each variable) associations. Standardized coefficients across time points differ due to varying standard errors.

For all three psychopathology indicators, deviations from the usual levels at the first study wave were linked with concurrent deviations in worry. Residuals were correlated only for within-person changes in posttraumatic stress symptoms and worry. Stability paths were significant across all waves for worry, prolonged grief and posttraumatic stress symptoms, but varied across waves for depressive symptoms.

Depressive Rumination and Psychopathology Symptoms

As shown in Table 4, at the between-person level, the stable trait-like component of depressive rumination was positively linked to all three psychopathology indicators. People with higher levels of depressive rumination scored higher on depressive symptoms, prolonged grief symptoms, and posttraumatic stress symptoms.

Within-person cross-lagged examinations showed that the association between depressive rumination and psychopathology symptoms is unidirectional. Although increases compared to usual levels in all three psychopathology indicators (i.e., depressive symptoms, prolonged grief symptoms, posttraumatic stress symptoms) at a study wave were predictors of increases in depressive rumination at the next study wave, the opposite effect was not significant.

Within-person associations at the first study wave yielded significant positive correlations between the deviations in psychopathology indicators and depressive rumination. Associations between residuals at the other study waves indicated significant correlations between within-person changes in psychopathology indicators and depressive rumination because of unmeasured other variables. Stability examinations revealed that any deviation in depressive rumination, prolonged grief symptoms, or posttraumatic stress symptoms at a study wave was a predictor of a deviation in the same variable at the next study

Table 4
RICLPMs for the Association Between Depressive Rumination and Mental Health

	Depressive symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.20**	**.02**	**<.001**	**.64**
Depressive rumination (t) –> Mental health indicator (t+1)	.04	.03	.14	.03 - .05
Mental health indicator (t) –> Dep. rumination (t+1)	**.17**	**.04**	**<.001**	**.13 - .20**
T1 within-person association	**.06**	**.02**	**<.001**	**.32**
T2-T11 residual associations	**.03**	**.00**	**<.001**	**.27 - .43**
Autoregressive paths for dep. rumination	**.19**	**.04**	**<.001**	**.15 - .22**
Autoregressive paths for mental health indicator	.01 - .62	.07 - .17	.00 - .96	.01 - .64
	PG symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.29**	**.03**	**<.001**	**.73**
Depressive rumination (t) –> Mental health indicator (t+1)	.05	.03	.10	.04 - .05
Mental health indicator (t) –> Dep. rumination (t+1)	**.11**	**.03**	**<.001**	**.11 - .16**
T1 within-person association	**.07**	**.02**	**<.001**	**.33**
T2-T11 residual associations	**.04**	**.01**	**<.001**	**.32 - .53**
Autoregressive paths for depressive rumination	**.19**	**.04**	**<.001**	**.16 - .22**
Autoregressive paths for mental health indicator	**.47**	**.04**	**<.001**	**.44 - .56**
	PTS symptoms			
	b	*SE*	*p*	β/*r*
Between-level association	**.18**	**.02**	**<.001**	**.74**
Depressive rumination (t) –> Mental health indicator (t+1)	.04	.02	.06	.52 - .66
Mental health indicator (t) –> Depressive rumination (t+1)	**.27**	**.05**	**<.001**	**.18 - .22**
T1 within-person association	**.04**	**.01**	**<.001**	**.31**
T2-T11 residual associations	**.03**	**.00**	**<.001**	**.30 - .46**
Autoregressive paths for depressive rumination	**.17**	**.04**	**<.001**	**.14 - .19**
Autoregressive paths for mental health indicator	**.35**	**.04**	**<.001**	**.33 - .41**

Note. RICLPM = Random intercept cross-lagged panel model. PG = prolonged grief. PTS = posttraumatic stress disorder. Coefficients in bold were same and constantly significant across study waves. For the remaining non-bold paths, significance varied across study waves. The last column (β/*r*) shows the standardized coefficients for both unidirectional (β; rows 2, 3, 6, and 7 for each variable) and bidirectional (*r*; rows 1, 4, and 5 for each variable) associations. Standardized coefficients across time points differ due to varying standard errors.

wave. Significance of stability paths differed across waves for depressive symptoms.

Worry and Depressive Rumination

The results (see Table 5) revealed that worry and depressive rumination were positively associated at the between-person level. This link between the stable trait-like components of worry and depressive rumination shows that people who have higher levels of worry were likely to have higher levels of depressive rumination too.

More importantly, results yielded reciprocal cross-lagged links between within-person variations in worry and depressive rumination. That is, any within-person deviation from the usual level of worry at a study wave was a predictor of a deviation from the usual level of depressive rumination at the next study wave, and vice versa. If worry (depressive rumination) increased at a study wave, depressive rumination (worry) increased at the next wave. Comparisons of these two cross-lagged effects showed that they did not differ from each other, meaning that the longitudinal effect of worry on depressive rumination was as influential as the longitudinal effect of depressive rumination on worry (Wald = 0.02, $df = 1$, $p = .89$).

The moderate level of the within-person correlation at the first study wave showed that the simultaneous deviations from the usual levels in worry and depressive rumination were positively linked to each other. Within-person correlations at the other waves reflected the residual associations between the changes in these two variables due to unmeasured other variables. Last, both worry and depressive rumination showed significant stability across study waves. That is, a deviation from the usual level in worry/depressive rumination at a study wave was a predictor of a deviation from the usual level in the same variable at the next study wave.

Power

We conducted a post hoc Monte Carlo power simulation (Muthén & Muthén, 2002) using the estimates in our study. Our power was greater .80 to detect most cross-lagged associations under investigation (75%) for the average number of participants per study wave.

Discussion

This study aimed to clarify the reciprocal associations between repetitive negative thought (i.e., worry and depressive rumination) and depressive, prolonged grief, and posttraumatic stress symptoms as well as between worry and depressive rumination. For clarity, from RICLPMs we can derive whether higher levels than usual of variable A are predictive of higher levels of variable B at the next time-point (Orth et al., 2021). Our analyses showed that (a) changes in worry and psychopathology symptoms mutually predicted each other, yet that the effect of psychopathology symptoms on worry was stronger than vice versa (note: worry did not consistently predict prolonged grief symptoms), (b) changes in psychopathology symptoms predicted changes in depressive rumination, but not vice versa, and (c) changes in worry and depressive rumination mutually predicted each other.

The finding that worry relatively consistently predicted all psychopathology outcomes complements a prior longitudinal study by Eisma et al. (2017). They showed positive longitudinal associations between worry and depression and prolonged grief symptoms over 6 months, while controlling for baseline symptoms. However, similar analyses by Boelen et al. (2016) in a smaller sample yielded null-results. Notably, psychopathology symptoms also predicted worry at the next time-point and these effects were larger than the reverse effect. Multiple processes could

Table 5
RICLPM for the Association Between Worry and Depressive Rumination

	Dep. rumination			
	b	*SE*	*p*	β/*r*
Between-level association	**.35**	**.03**	**<.001**	**.73**
Worry (t) –> Dep. rumination (t+1)	**.09**	**.03**	**<.001**	**.11 - .17**
Dep. rumination (t) –> Worry (t+1)	**.10**	**.05**	**.03**	**.05 - .08**
T1 within-person association	**.11**	**.03**	**<.001**	**.45**
T2-T11 residual associations	**.05**	**.01**	**<.001**	**.27 - .48**
Autoregressive paths for Worry	**.30**	**.04**	**<.001**	**.27 - .35**
Autoregressive paths for Dep. rumination	**.20**	**.05**	**<.001**	**.16 - .23**

Note. RICLPM = Random intercept cross-lagged panel model. Dep. rumination = depressive rumination. The last column (β/*r*) shows the standardized coefficients for both unidirectional (*β;* rows 2, 3, 6, and 7) and bidirectional (*r*; rows 1, 4, and 5) associations. All coefficients were the same and constantly significant across study waves. Standardized coefficients across time points differ due to varying standard errors.

underlie this pattern of findings. First, it may be that those experiencing the most severe affective disturbances are more inclined to use worry as a cognitive avoidance strategy to temporarily reduce the impact of painful memories (Borkovec et al., 1998). Second, the people closest to the deceased often experience most restoration-oriented stressors (i.e., stressors that come about as a secondary consequence of the loss). For example, partners (vs. other bereaved) more often take care of practical issues, take on new life roles, and perform new tasks previously done by the deceased (Eisma et al., in press). Those who experience most distress thus also often encounter more stressors that could elicit worry. Future work could aim to elucidate which of these, or other, mechanisms accounts for the effects of psychopathology symptoms on worry. In turn, the continuous cognitive activity that characterizes worry could in the long run impede emotional processing of painful aspects of the loss and perpetuate distress (Eisma et al., 2017). Generally, findings support a reciprocal relation between worry and post-loss psychopathology severity, which could signal a downward spiral.

Changes in depressive rumination did not significantly predict changes in loss-related psychopathology symptoms. These findings complement results from three prior longitudinal studies finding no significant predictive effects of brooding on symptoms of depression, prolonged grief and/or posttraumatic stress whilst controlling for baseline symptoms (Boelen et al., 2016; Eisma et al., 2012, 2015). Findings appear at odds with Nolen-Hoeksema et al. (1994), who found that depressive rumination predicted depressive symptoms over and above baseline symptoms in a bereaved sample. Results from bereaved samples also do not converge with many longitudinal studies on nonbereaved samples, showing that depressive rumination prospectively predicts depression severity (e.g., Burwell & Shirk, 2007; Just & Alloy, 1997; Treynor et al., 2003; for a review: Nolen-Hoeksema et al., 2008). Another main finding was that changes in all psychopathology indicators predicted changes in depressive rumination. This supports the notion that negative affect (integral to depression, prolonged grief and posttraumatic stress reactions) elicits depressive rumination (Nolen-Hoeksema et al., 2008). Possibly, rumination serves as a strategy to comprehend the nature, causes, and consequences of these experiences. Taken together, it appears that depressive rumination is primarily a consequence, rather than a driving mechanism, of affective and stress-related symptomatology in bereaved adults.

Does this imply that rumination is not important in psychological adjustment to bereavement? Or does it imply that repetitive thought is not truly a transdiagnostic risk-factor? The answer to these questions is likely nuanced. Rumination is a discrepancy-focused thinking style and people using it will focus on the discrepancy most salient to them in any specific situation (Martin & Tesser, 1996; Watkins & Roberts, 2020). Among depressed individuals, the most salient discrepancy is the difference between one's negative mood state and a desired different mood state. Consequently, they will ruminate about the causes and consequences of negative affect. After loss, longing for, but not being able to obtain closeness to the lost person is the most salient discrepancy. Consequently, people will ruminate about the events leading up to the death and the consequences of bereavement (e.g., Davis et al., 1995; Eisma et al., 2021). Indeed, Davis et al. (1995) demonstrated that 4 to 7 years following the accidental death of a partner or child, about half of bereaved people still recurrently thought about how their lives would be better if they had prevented the death. Eisma et al. (2021) recently demonstrated that such counterfactual thoughts showed moderate to strong temporal effects on depressive and prolonged grief symptoms 6 and 12 months later, even when controlling for baseline symptoms. All this suggests rumination is a transdiagnostic risk factor, but only as far as the thoughts being measured are directly relevant to those experiencing them.

Last, we demonstrated that changes in worry predict changes in brooding and vice versa in within-person analyses. It is not difficult to imagine how a bereaved person's rumination about depressive feelings could result in worries about life changes and uncertainty resulting from the loss. Vice versa, worrying about the secondary stressors of a loss, this could result in depressive feelings, that could in turn elicit rumination about the causes and consequences of these feelings (for a similar line of reasoning: McLaughlin et al., 2007). Generally speaking, results extend findings from a meta-analysis demonstrating positive concurrent associations between both constructs across studies (Naragon-Gainey et al., 2017). Our findings complement results from a recent longitudinal study in a nonclinical sample, which showed with traditional cross-lagged analyses that brooding predicted worry, but not vice versa (Anyan et al., 2020).

The present study shows that depressive rumination and worry are closely associated processes, yet with distinct effects on post-loss psychological

adaptation. Most notably, our findings support increased attention to worry within theoretical frameworks and practice to understand and negate the negative psychological consequences of bereavement. Within PGD treatments that allow for specific targeting of repetitive thought styles, one could focus specifically on the worries of bereaved people. For example, as part of metacognitive therapy for PGD, a therapist may focus on altering negative and positive beliefs hypothesized to lead to the persistence of worry (Wenn et al., 2019). More generally, the present results point to the importance of anxiety and related constructs in post-loss adaptation. Our findings on worry are compatible with previous studies showing associations between anxiety and panic-related symptoms and severe grief reactions. For example, Yan et al. (2021) demonstrated that acute anxiety in the first month following loss predicted subsequent depression and prolonged grief symptomatology 3 months later. So, acute anxiety reactions and related processes (e.g., worry) may precede the development of other loss-related psychopathology.

Using depressive rumination as a treatment target appears less important as our study and prior work generally does not support a substantive role for this thought process in the persistence of loss-related psychopathology. This may be due to the differences in rumination across contexts. In our view, future research should continue to focus on understanding the role of worry, as well as (subtypes of) grief-related rumination, when aiming to further elucidate the effects of repetitive negative thought in recovery from bereavement.

Last, the fact that the effects of psychopathology symptoms on repetitive thought styles were stronger than vice versa, suggests that directly targeting these symptoms could also be effective in reducing the extent to which people engage in these thought styles. Indeed, these findings support the importance of applying evidence-based rumination-focused treatments applying techniques such as behavioral activation, to increase the number of valued activities that people undertake, to improve mood and thereby reduce repetitive negative thought after bereavement (e.g., Eisma et al., 2015; Papa et al., 2013).

Strengths of the present study include a sample of recently bereaved persons, a prospective cohort design, a large number of measurement points, and the application of within-person cross-lagged analyses to shed light on reciprocal associations between worry, depressive rumination, and severity of common post-loss psychopathology. While this has offered unique insights into the role of repetitive negative thought in psychological adaptation to bereavement, the study also had limitations. First, recruiting volunteers online yielded a sample that is predominantly female and highly educated. While this is common in bereavement research (Eisma & Stroebe, 2021), we recommend future replication of this work with samples with more men and lower educated people. Second, after the first measurement moment, a third of participants dropped out of the study. However, no significant differences emerged between these dropouts and other participants. Moreover, effects from our analyses held when limiting these to the participants who filled in more than one survey. Therefore, we conclude that this initial dropout did not significantly impact the findings. Third, use of survey methodology comes with specific limitations, such as recency and social desirability biases. Fourth, to measure rumination and worry over 1.5 month intervals, we slightly adapted existing scales. Past research has demonstrated that repetitive thought can be validly assessed across many different intervals (e.g., daily, weekly) by adapting the same scales (e.g., Stoeber and Bittencourt, 1998). Therefore, using these adapted scales has likely not compromised our findings. Last, although we referred to between- and within-person variance in our research, those variances' conceptual and theoretical meanings might to a degree overlap (Steyer et al., 1992). For example, a participant's temporary response at a study wave (i.e., within-person component) could be affected by both situational factors and personality characteristics. Thus, within-person variance in our research might have included some variance resulting from an individual difference.

Conclusions

In summary, this study supports reciprocal relationships between worry and symptoms of depression, prolonged grief, and posttraumatic stress in bereaved persons. Our findings show that worry plays an integral part in the perpetuation of post-loss psychopathology (Eisma et al., 2017), whereas depressive rumination appears a consequence of such problems. Generally, results support a continued focus on identifying and improving understanding of the types of repetitive negative thought that are most relevant to post-loss adaptation, so that this knowledge can be applied to improve therapies for severely distressed bereaved people.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.beth.2022.01.001.

References

Allison, P. D. (2003). Missing data techniques for structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 545–557. https://doi.org/10.1037/0021-843X.112.4.545.

American Psychiatric Association (2020). Board approves new prolonged grief disorder for DSM. Retrieved November 28, 2020, from doi: 101176/appi.pn.2020.11a12.

Anyan, F., Morote, R., & Hjemdal, O. (2020). Temporal and reciprocal relations between worry and rumination among subgroups of metacognitive beliefs. *Frontiers in Psychology, 11*, 551503. https://doi.org/10.3389/fpsyg.2020.551503.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. *Journal of Psychosomatic Research, 52*(2), 69–77. https://doi.org/10.1016/s0022-3999(01)00296-3.

Boelen, P. A. (2010). Intolerance of uncertainty and emotional distress following the death of a loved one. *Anxiety, Stress, & Coping, 23*(4), 471–478. https://doi.org/10.1080/10615800903494135.

Boelen, P. A. (2012). Variables mediating the linkage between loss centrality and postloss psychopathology. *Journal of Nervous & Mental Disease, 200*(9), 801–806. https://doi.org/10.1097/nmd.0b013e318266ba02.

Boelen, P. A., de Keijser, J., van den Hout, M. A., & van den Bout, J. (2007). Treatment of complicated grief: A comparison between cognitive-behavioral therapy and supportive counseling. *Journal of Consulting and Clinical Psychology, 75*(2), 277–284. https://doi.org/10.1037/0022-006x.75.2.277.

Boelen, P. A., & Lenferink, L. I. M. (2020). Associations of depressive rumination and positive affect regulation with emotional distress after the death of a loved one. *Clinical Psychology & Psychotherapy, 27*(6), 955–964. https://doi.org/10.1002/cpp.2482.

Boelen, P. A., Reijntjes, A., & Smid, G. E. (2016). Concurrent and prospective associations of intolerance of uncertainty with symptoms of prolonged grief, posttraumatic stress, and depression after bereavement. *Journal of Anxiety Disorders, 41*, 65–72. https://doi.org/10.1016/j.janxdis.2016.03.004.

Borkovec, T. D., Ray, W. J., & Stober, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research, 22*(6), 561–576. https://doi.org/10.1023/a:1018790003416.

Burwell, R. A., & Shirk, S. R. (2007). Subtypes of rumination in adolescence: Associations between brooding, reflection, depressive symptoms, and coping. *Journal of Clinical Child and Adolescent Psychology, 36*(1), 56–65. https://doi.org/10.1080/15374410709336568.

Davis, C. G., Lehman, D. R., Wortman, C. B., Silver, R. C., & Thompson, S. C. (1995). The undoing of traumatic life events. *Personality and Social Psychology Bulletin, 21*(2), 109–124. https://doi.org/10.1177/0146167295212002.

Doering, B. K., & Eisma, M. C. (2016). Treatment for complicated grief: State of the science and ways forward. *Current Opinion in Psychiatry, 29*(5), 286–291. https://doi.org/10.1097/YCO.0000000000000263.

Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy, 1*(3), 192–205. https://doi.org/10.1521/ijct.2008.1.3.192.

Eisma, M. C., Boelen, P. A., Schut, H. A. W., & Stroebe, M. S. (2017). Does worry affect adjustment to bereavement? A longitudinal study. *Anxiety, Stress & Coping, 30*(3), 243–252. https://doi.org/10.1080/10615806.2016.1229464.

Eisma, M. C., Boelen, P. A., van den Bout, J., Stroebe, W., Schut, H. A. W., Lancee, J., & Stroebe, M. S. (2015). Internet-based exposure and behavioral activation for complicated grief and rumination: A randomized controlled trial. *Behavior Therapy, 46*(6), 729–748. https://doi.org/10.1016/j.beth.2015.05.007.

Eisma, M. C., de Lang, T. A., & Boelen, P. A. (2020). How thinking hurts: Rumination, worry, and avoidance processes in adjustment to bereavement. *Clinical Psychology & Psychotherapy, 27*(4), 548–558. https://doi.org/10.1002/cpp.2440.

Eisma, M. C., Epstude, K., Schut, H. A., Stroebe, M. S., Simion, A., & Boelen, P. A. (2021). Upward and Downward Counterfactual Thought After Loss: A Multiwave Controlled Longitudinal Study. *Behavior Therapy, 52*(3), 577–593. https://doi.org/10.1016/j.beth.2020.07.007.

Eisma, M. C., de Lang, T. A., & Stroebe (in press). Restoration-oriented stressors of bereavement. *Anxiety, Stress & Coping*. https://doi.org/10.1080/10615806.2021.1957849.

Eisma, M. C., & Stroebe, M. S. (2021). Emotion regulatory strategies in complicated grief: A systematic review. *Behavior Therapy, 52*(1), 234–249. https://doi.org/10.1016/j.beth.2020.04.004.

Eisma, M. C., Stroebe, M. S., Schut, H. A. W., Boelen, P. A., Van den Bout, J., & Stroebe, W. (2012). " Waarom is dit mij overkomen?": Ontwikkeling en validatie van de Utrechtse Rouw Ruminatie Schaal. *Gedragstherapie, 45*, 369–388.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of Full Information Maximum Likelihood Estimation for missing data in structural equation models. *Structural Equation Modeling, 8*(3), 430–457. https://doi.org/10.1207/S15328007SEM0803_5.

Engelhard, I. M., Arntz, A., & Van den Hout, M. A. (2007). Low specificity of symptoms on the post-traumatic stress disorder (PTSD) symptom scale: A comparison of individuals with PTSD, individuals with other anxiety disorders and individuals without psychopathology. *British Journal of Clinical Psychology, 46*(4), 449–456. https://doi.org/10.1348/014466507x206883.

Everaert, J., & Joormann, J. (2020). Emotion regulation habits related to depression: A longitudinal investigation of stability and change in repetitive negative thinking and positive reappraisal. *Journal of Affective Disorders, 276*, 738–747. https://doi.org/10.1016/j.jad.2020.07.058.

Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment, 9*(4), 445–451. https://doi.org/10.1037/1040-3590.9.4.445.

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods, 20*, 102–116. https://doi.org/10.1037/a0038889.

Hopko, D. R., Reas, D. L., Beck, J. G., Stanley, M. A., Wetherell, J. L., Novy, D. M., & Averill, P. M. (2003). Assessing worry in older adults: Confirmatory factor analysis of the Penn State Worry Questionnaire and psychometric properties of an abbreviated model. *Psycho-*

logical Assessment, 15(2), 173–183. https://doi.org/10.1037/1040-3590.15.2.173.

Ito, T., Tomita, T., Hasui, C., Otsuka, A., Katayama, Y., Kawamura, Y., Muraoka, M., Miwa, M., Sakamoto, S., Agari, I., & Kitamura, T. (2003). The link between response styles and major depression and anxiety disorders after child-loss. *Comprehensive Psychiatry, 44*(5), 396–403. https://doi.org/10.1016/s0010-440x(03)00109-3.

Johannsen, M., Damholdt, M. F., Zachariae, R., Lundorff, M., Farver-Vestergaard, I., & O'Connor, M. (2019). Psychological interventions for grief in adults: A systematic review and meta-analysis of randomized controlled trials. *Journal of Affective Disorders, 253*, 69–86. https://doi.org/10.1016/j.jad.2019.04.065.

Johnson, D. R., & Young, R. (2011). Toward best practices in analyzing datasets with missing data: Comparisons and recommendations. *Journal of Marriage and Family, 73*, 926–945. https://doi.org/10.1111/j.1741-3737.2011.00861.x.

Just, N., & Alloy, L. B. (1997). The response styles theory of depression: Tests and an extension of the theory. *Journal of Abnormal Psychology, 106*(2), 221–229. https://doi.org/10.1037/0021-843X.106.2.221.

Keijsers, L. (2016). Parental monitoring and adolescent problem behaviors: How much do we really know? *International Journal of Behavioral Development, 40*, 271–281. https://doi.org/10.1177/0165025415592515.

Martin, L., & Tesser, A. (1996). Some ruminative thoughts. In R. Wyer (Ed.). *Advances in Social Cognition* (Vol. 9, pp. 1–48). Lawrence Erlbaum Associates.

McLaughlin, K. A., Borkovec, T. D., & Sibrava, N. J. (2007). The effects of worry and rumination on affect states and cognitive activity. *Behavior Therapy, 38*(1), 23–38. https://doi.org/10.1016/j.beth.2006.03.003.

Moulds, M. L., Bisby, M. A., Wild, J., & Bryant, R. A. (2020). Rumination in posttraumatic stress disorder: A systematic review. *Clinical Psychology Review, 82*, 101910. https://doi.org/10.1016/j.cpr.2020.101910.

Muthén, L.K. & Muthén, B.O. (1998-2017). *Mplus User's Guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling, 9*(4), 599–620.

Naragon-Gainey, K., McMahon, T. P., & Chacko, T. P. (2017). The structure of common emotion regulation strategies: A meta-analytic examination. *Psychological Bulletin, 143*(4), 384–427. https://doi.org/10.1037/bul0000093.

Nolen-Hoeksema, S., & Davis, C. G. (1999). "Thanks for sharing that": Ruminators and their social support networks. *Journal of Personality and Social Psychology, 77*(4), 801–814. https://doi.org/10.1037/0022-3514.77. 4.801.

Nolen-Hoeksema, S., Stice, E., Wade, E., & Bohon, C. (2007). Reciprocal relations between rumination and bulimic, substance abuse, and depressive symptoms in female adolescents. *Journal of Abnormal Psychology, 116*(1), 198–207. https://doi.org/10.1037/0021-843X.116.1.198.

Nolen-Hoeksema, S., McBride, A., & Larson, J. (1997). Rumination and psychological distress among bereaved partners. *Journal of Personality and Social Psychology, 72*, 855–862. https://doi.org/10.1037//0022-3514.72.4.855.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*, 115–121. https://doi.org/10.1037//0022-3514.61.1.115.

Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology, 67*, 92–104. https://doi.org/10.1037//0022-3514.67.1.92.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*, 400–424. https://doi.org/10.1111/j.1745-6924.2008.00088.x.

Olatunji, B. O., Naragon-Gainey, K., & Wolitzky-Taylor, K. B. (2013). Specificity of rumination in anxiety and depression: A multimodal meta-analysis. *Clinical Psychology: Science and Practice, 20*(3), 225–257. https://doi.org/10.1037/h0101719.

Orth, U., Clark, D. A., Donnellan, M. B., & Robins, R. W. (2021). Testing prospective effects in longitudinal research: Comparing seven competing cross-lagged models. *Journal of Personality and Social Psychology, 120*(4), 1013–1034. https://doi.org/10.1037/pspp0000358.

Papa, A., Rummel, C., Garrison-Diehn, C., & Sewell, M. T. (2013). Behavioral Activation for Pathological Grief. *Death Studies, 37*(10), 913–936. https://doi.org/10.1080/07481187.2012.692459.

Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., Raphael, B., Marwit, S. J., Wortman, C., Neimeyer, R. A., Bonanno, G. A., Block, S. D., Kissane, D., Boelen, P., Maercker, A., Litz, B. T., Johnson, J. G., First, M. B., & Maciejewski, P. K. (2009). Prolonged Grief Disorder: Psychometric Validation of Criteria Proposed for DSM-V and ICD-11. *PLoS Medicine, 6*(8), e1000121. https://doi.org/10.1371/journal.pmed.1000121.

Prigerson, H. G., Kakarala, S., Gang, J., & Maciejewski, P. K. (2021). History and status of prolonged grief disorder as a psychiatric diagnosis. *Annual Review of Clinical Psychology, 17*, 109–126. https://doi.org/10.1146/annurev-clinpsy-081219-093600.

Querstret, D., & Cropley, M. (2013). Assessing treatments used to reduce rumination and/or worry: A systematic review. *Clinical Psychology Review, 33*(8), 996–1009. https://doi.org/10.1016/j.cpr.2013.08.004.

Schoofs, H., Hermans, D., & Raes, F. (2010). Brooding and reflection as subtypes of rumination: Evidence from confirmatory factor analysis in nonclinical samples using the Dutch Ruminative Response Scale. *Journal of Psychopathology and Behavioral Assessment, 32*(4), 609–617. https://doi.org/10.1007/s10862-010-9182-9.

Segerstrom, S. C., Stanton, A. L., Alden, L. E., & Shortridge, B. E. (2003). A multidimensional structure for repetitive thought: What's on your mind, and how, and how much? *Journal of Personality and Social Psychology, 85*(5), 909–921. https://doi.org/10.1037/0022-3514.85.5.909.

Shear, K., Frank, E., Houck, P. R., & Reynolds, C. F. (2005). Treatment of Complicated Grief. *JAMA, 293*(21), 2601. https://doi.org/10.1001/jama.293.21.2601.

Spinhoven, P., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., Speckens, A. E. M., & Hemert, A. M. V. (1997). A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychological Medicine, 27*(2), 363–370. https://doi.org/10.1017/s0033291796004382.

Steyer, R., Ferring, D., & Schmitt, M. J. (1992). States and traits in psychological assessment. *European Journal of Psychological Assessment, 8*, 79–98.

Stoeber, J., & Bittencourt, J. (1998). Weekly assessment of worry: an adaptation of the Penn State Worry Questionnaire for monitoring changes during treatment. *Behaviour*

Research and Therapy, 36(6), 645–656. https://doi.org/10.1016/S0005-7967(98)00031-X.

Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27*(3), 247–259. https://doi.org/10.1023/a:1023910315561.

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin, 134*(2), 163–206. https://doi.org/10.1037/0033-2909.134.2.163.

Watkins, E. R., & Roberts, H. (2020). Reflecting on rumination: Consequences, causes, mechanisms and treatment of rumination. *Behaviour Research and Therapy, 127*, 103573. https://doi.org/10.1016/j.brat.2020.103573.

Wenn, J. A., O'Connor, M., Kane, R. T., Rees, C. S., & Breen, L. J. (2019). A pilot randomised controlled trial of metacognitive therapy for prolonged grief. *BMJ Open, 9*(1), e021409. https://doi.org/10.1136/bmjopen-2017-021409.

World Health Organization. (2018). *International Classification of Diseases* (11th revision). https://icd.who.int/browse11/lm/en#/http://id.who.int/icd/entity/1183832314

Yan, B., Lo, R. S. K., & Chow, A. Y. M. (2021). The role of post-loss anxiety in the development of depressive symptoms and complicated grief symptoms: A longitudinal SEM study. *Journal of Affective Disorders, 281*, 649–656. https://doi.org/10.1016/j.jad.2020.11.096.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67*(6), 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x.

Zisook, S., Iglewicz, A., Avanzino, J., Maglione, J., Glorioso, D., Zetumer, S., Seay, K., Vahia, I., Young, I., Lebowitz, B., Pies, R., Reynolds, C., Simon, N., & Shear, M. K. (2014). Bereavement: Course, consequences, and care. *Current Psychiatry Reports, 16*(10). https://doi.org/10.1007/s11920-014-0482-8.

Received: June 8, 2021
Accepted: January 4, 2022
Available online: 11 January 2022