

**The Effect of Grief Cognitions on Fluctuations in Yearning and Emotional Pain of
Bereaved Individuals: An Experience Sampling Method Study**

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“There is no pain so great as the memory of joy in present grief” — Aeschylus

Abstract

Background: A minority of bereaved individuals is affected by prolonged grief disorder (PGD). Research has established a positive association between negative grief cognitions and PGD symptom levels. The effect of grief cognitions on fluctuations in specific PGD symptoms in daily life is unexplored. Based on the adaptive oscillation proposed by the dual process model, we hypothesized that higher levels of grief cognitions would be associated with lower levels of fluctuation in yearning and in emotional pain.

Methods: Participants' ($N = 55$; 73% female) grief cognition and PGD symptom levels were assessed with an interview. In a subsequent 14-day ESM phase, yearning and emotional pain were recorded five times a day. The mean square of successive differences of yearning and of emotional pain was computed to estimate within-person fluctuations in each PGD symptom. Fluctuations in yearning and emotional pain were regressed on negative grief cognitions.

Results & Conclusion: While grief cognitions were associated with greater fluctuations in yearning, no significant effect on fluctuations in emotional pain was found. The positive correlation between cross-sectional grief cognitions and PGD symptom levels supported earlier findings. The study provides first findings describing the relationship between a person-related variable and fluctuations in everyday PGD symptomatology. Persisting fluctuations in yearning might indicate the necessity to target grief cognitions in interventions. Future ESM studies should investigate fluctuations in PGD symptoms in the two years post-loss.

Keywords: prolonged grief disorder, experience sampling method, grief cognitions, fluctuations, yearning, emotional pain

The Effect of Grief Cognitions on Fluctuations in Yearning and Emotional Pain of Bereaved Individuals: An Experience Sampling Method Study

Bereavement is a highly stressful life-event and eventually nearly everyone is confronted with it (Stroebe et al., 2007). In the last decades of proliferating bereavement research, scientists have reached a consensus: The reaction to bereavement – grief – is an idiosyncratic process with heterogeneous forms (Arizmendi & O'Connor, 2015; Lenferink & Eisma, 2018; Stroebe et al., 2017). Despite this complexity, groups with different grief trajectories have been identified (Bonanno & Malgaroli, 2020; Nielsen et al., 2019). The majority of individuals responds to bereavement by showing resilience or recovery from acute grief reactions within one year since the loss. Approximately 10-30% of bereaved individuals develop complicated grief, a syndrome characterized by severe and persistent loss-related distress (Lundorff et al., 2017; Parro-Jiménez et al., 2021; Wilson et al., 2020).

Besides this established interindividual variability, intraindividual variability has been proposed. According to the dual process model of coping with bereavement (DPM), the integration of the loss occurs in everyday life, via oscillation between loss-orientation and restoration-orientation (Stroebe & Schut, 1999, 2010). Further, mourners themselves use the metaphor of a rollercoaster to capture the dynamic of the psychological journey following losses (Blazin et al., 2020; Gould, 1994).

The empirical evidence describing this within-person variability is limited. In a diary study, complicated grief patients altered the pattern of daily activities toward a less regular schedule compared to healthy controls (Monk et al., 2006). This association suggests a variability within daily experiences of individuals affected by grief reactions. When testing the oscillation proposed in the DPM (Stroebe & Schut, 2010), Bisconti and colleagues (2004) found that rapid within-person changes in emotional well-being indicated successful adaptation to the loss in bereaved spouses. Hence, these findings might suggest that adaptive

grieving is characterized by intraindividual variability in grief responses. Nevertheless, to date, no study has examined how grief reactions fluctuate in the daily lives of bereaved individuals.

Exploring patterns of short-term grief variability would expand the scientific understanding of day-to-day coping with bereavement, moving beyond findings based on data assessed cross-sectionally or at few timepoints (De Stefano et al., 2021; Mason et al., 2020). The latter showed that concurrent grief reactions predicted the presence of the same complaints at various subsequent timepoints (Djelantik et al., 2018; Lenferink et al., 2019). A closer inspection of grief phenomenology would enhance the understanding of mechanisms associated with adaptation to bereavement. Thereby, processes that are challenging yet conducive to recovery could be normalized, while maladaptive processes could be addressed in the development of complicated grief interventions.

Such intensive longitudinal research of symptom variability has been mostly conducted on affect (Crowe et al., 2019; Houben et al., 2015). For example, Trull and colleagues (2008) found that borderline personality disorder patients reported significantly more fluctuations in affect over time compared to depressive patients, although the groups showed comparable mean levels of positive and negative affect. Thus, intraindividual symptom variability provides unique clinical information, that adds to findings on interindividual variability (Myin-Germeys et al., 2018). Considering the prevalence of individuals facing bereavement (Osterweis et al., 1984; Stroebe et al., 2007), using intraindividual grief variability to identify factors predicting maladjustment is indicated.

Dynamic symptom patterns were commonly examined using an experience sampling method (ESM; Hamaker et al., 2015). This approach yields intensive longitudinal data with ecological validity (Verhagen et al., 2016; Trull & Ebner-Priemer, 2009). The real-time assessment decreases the effect of recall bias, compared to retrospective self-reports.

Reducing sources of error is crucial when investigating short-term changes in complex processes (Trull & Ebner-Priemer, 2009), such as grief (Stroebe et al., 2017).

Previous studies have employed ESM to explore the relationship between symptom variability and person variables in several clinical fields (Chun, 2016; Müller et al., 2021; Trull et al., 2008). For instance, fluctuations in positive as well as negative affect were highest in individuals with current depression or anxiety diagnoses compared to remitting or healthy controls (Schoevers et al., 2021). Thus, the question arises: How does within-person variability relate to between-person variability in the context of bereavement? To respond to this gap in research, the current study investigated fluctuations in complicated grief symptoms and their relation to bereaved individuals' grief cognitions.

Grief Cognitions

Prolonged grief disorder (PGD) is a specific form of complicated grief. It has been defined as a “prolonged maladaptive grief reaction”, which can be diagnosed no earlier than six (World Health Organization [WHO], 2019), or 12 months (American Psychiatric Association [APA], 2022, para. Prolonged Grief Disorder) after the death of a significant other. According to the cognitive-behavioural model of PGD, persistent negative thinking represents one of three key processes contributing to the persistence and exacerbation of grief responses (Boelen et al., 2006b). In particular, global negative beliefs about the self, life, and the future, and catastrophic misinterpretations of grief reactions seem crucial in the grieving process (Boelen et al., 2003a, 2003b; Boelen & Lensvelt-Mulders, 2005). A positive association between negative grief cognitions and PGD symptom levels has been empirically supported in cross-sectional (Kokou-Kpolou et al., 2018; Nagy & Szamosközi, 2014) and longitudinal studies (Boelen et al., 2006a; Skritskaya et al., 2017). Investigations on the relation of grief cognitions to fluctuations in PGD symptoms would clarify the clinical features of this subgroup of bereaved individuals and illustrate the potential effect of

interventions modifying negative cognitions on daily symptomatology. However, this relationship is yet unexplored.

Several theorists propose that negative cognitions block the integration of the loss into autobiographical memory, thereby hindering an adaptive grieving process (Boelen et al., 2006b; Ehlers, 2006). From a DPM perspective (Stroebe & Schut, 2010), loss-related cognitions likely prevent oscillation between loss-oriented and restoration-oriented coping, which is deemed necessary to adapt to bereavement. Thus, the dynamic process occurring during “normal” grief may be more rigid in individuals strongly endorsing negative grief cognitions. Specifically, these beliefs might maintain the focus on the loss, thereby promoting decreased context-dependency of responses and reducing engagement in restoration-oriented coping. To test this idea, the present study investigated the effect of grief cognitions on fluctuations in PGD symptoms in the daily lives of bereaved individuals. The analysis focuses on yearning and emotional pain.

Yearning

Yearning was selected as one of the examined PGD symptoms. Researchers consider yearning a hallmark symptom of grief for two reasons. First, it is the most recorded grief response across cultural groups (Maciejewski et al., 2007; Robinaugh et al., 2014; Stelzer et al., 2020). Second, persistent and intense yearning was found to distinguish PGD from other clinical presentations following bereavement (Prigerson et al., 2009; Robinaugh et al. 2016b; Shear et al., 2011). Moreover, in network analyses of complicated grief, yearning was suggested to spread the activation to other PGD symptoms (Margaroli et al., 2018; Stelzer et al., 2020). Consequently, yearning appears across sets of diagnostic criteria for PGD (Lenferink et al., 2021).

Yearning has been conceptualized as a cognitive-affective process focused on an object of desire (Boddez, 2018; Kaplan et al., 2018; Robinaugh et al., 2016a). The cognitive

component consists of repetitive mental comparisons between the current reality of the loss and an alternative future state, in which the deceased lives. These representations evoke a bittersweet emotional experience including negative as well as positive affect (Eisma et al., 2020; O'Connor & Sussman, 2014; Shear et al., 2005).

Yearning and Grief Cognitions

Compared to bereaved controls, individuals suffering from PGD showed difficulties recalling or imagining events *not* including the deceased (Robinaugh & McNally, 2013). This decreased ability to envision future situations without the deceased was suggested to underlie yearning (Robinaugh & MacNally, 2013). PGD patients might be drawn to imagine a future with their significant other, thereby maintaining a world view, in which the reality of the loss is not integrated. Similarly, through the impairments in recalling past events without the deceased the self-identity remains tied to the lost person. This likely contributes to the sense of lost identity when confronted with the loss (Maccallum & Bryant, 2008, 2010). The grief cognitions identified by Boelen and colleagues (2005, 2006a, 2006b) share this theme of current inadequacy and the idea that post-loss positive experiences are unlikely.

These findings might suggest a relation between grief cognitions and yearning. Loss-related cognitions might foster recollections of the deceased, consequently evoking imagined future situations with the lost person, which provide the basis for yearning. Thus, grief cognitions might function as an internal stimulus prompting yearning. Accordingly, individuals with a high degree of grief cognitions would experience a more stable level of yearning, compared to individuals low on grief cognitions. In the latter, yearning may be primarily elicited by external reminders, thereby assuming a context-dependent and more variable dynamic.

Emotional Pain

Emotional pain is the second PGD symptom selected for this investigation. It has been considered a key feature of grief in the early stages of bereavement research (Parkes, 1972; Shear et al., 2005). Recently, researchers have rediscovered its relevance within PGD symptomatology. In network analyses of complicated grief, emotional pain showed the highest degree of centrality and of expected influence (Robinaugh et al., 2014, 2016b; Stelzer et al., 2020). Accordingly, emotional pain is represented in the latest diagnostic criteria for PGD (APA, 2022; WHO, 2019).

Whereas the DSM-5-TR merely states anger, bitterness and guilt as examples of emotional pain (APA, 2022), the ICD-11 defines it more broadly (WHO, 2019). Emotional pain has been suggested to be derived from unwanted separation (Frumkin et al., 2021).

Emotional Pain and Grief Cognitions

Evidence directly connecting negative grief cognitions to emotional pain is absent. So far, studies have merely investigated the relationship between grief cognitions and overall PGD severity (Boelen et al., 2006a, 2016). Nonetheless, recent factor analyses showed that most PGD criteria sets were best represented by a one-factor model (Boelen et al., 2019; Boelen & Lenferink, 2020). Therefore, it is conceivable that single symptoms behave alike in relation to person variables: Emotional pain is likely to have a similar relationship to grief cognitions as yearning.

The Current Study

The purpose of this study is to investigate the relationship between negative grief cognitions and PGD symptoms of bereaved individuals in a natural context. As prior research has established a positive association between grief cognitions and PGD symptom levels, this correlation will be tested: Results are expected to confirm previous findings.

Although other research fields have suggested the relevance of investigating the relation of person variables to symptom variability, this link remains unexplored in the context of bereavement. Our ESM approach allows to investigate variability in day-to-day grief phenomenology and its relation to negative grief cognitions. Thereby, patterns of PGD symptom fluctuations associated with an established risk factor can be identified: Findings might be utilized for the development of PGD interventions. Thus, our main aim is to examine the effect of grief cognitions on fluctuations in yearning and emotional pain.

As grief cognitions could function as a reminder of the loss, yearning might be frequently triggered and constantly remain on a high level in bereaved individuals with stronger grief cognitions. Hence, we hypothesized that grief cognitions would significantly predict yearning variability. Specifically, individuals with higher levels of grief cognitions were expected to exhibit less fluctuations in yearning (Hypothesis 1).

Based on research showing a single dimensionality of PGD symptoms, negative grief cognitions were expected to relate similarly to fluctuations in emotional pain. It was hypothesized that high levels of grief cognitions would predict less variability in emotional pain (Hypothesis 2).

Method

Design

This correlational study examined the relationship between cross-sectional person-related data and intensive longitudinal data gathered via ESM. The effect of the independent variable grief cognitions on the outcome variables, fluctuation in yearning and fluctuation in emotional pain, was tested. These fluctuations were operationalized as estimates of within-person variability in the respective PGD symptom across the ESM assessment period.

Procedure

The ethical committee of the University of Twente approved the study (reference number 211101). Participants gave informed consent prior to assessments. Data collection took place between December 2021 and February 2022 and unfolded in two phases. At timepoint 1 (T1), bereaved individuals were interviewed via phone for approximately 30 minutes. Trained clinical psychology Master students adhered to a structured interview script and stored T1 data in Qualtrics. Following T1, participants were asked to complete the ESM assessment five times a day (every three hours) for 14 days. The completion of each assessment required approximately two minutes and was prompted by a text notification. Participants were instructed to respond as soon as possible thereafter, maximum within one hour. Reminder notifications appeared after 10 and 20 minutes. The research assistants communicated their availability for questions and contacted participants in case of multiple missed assessments.

Participants

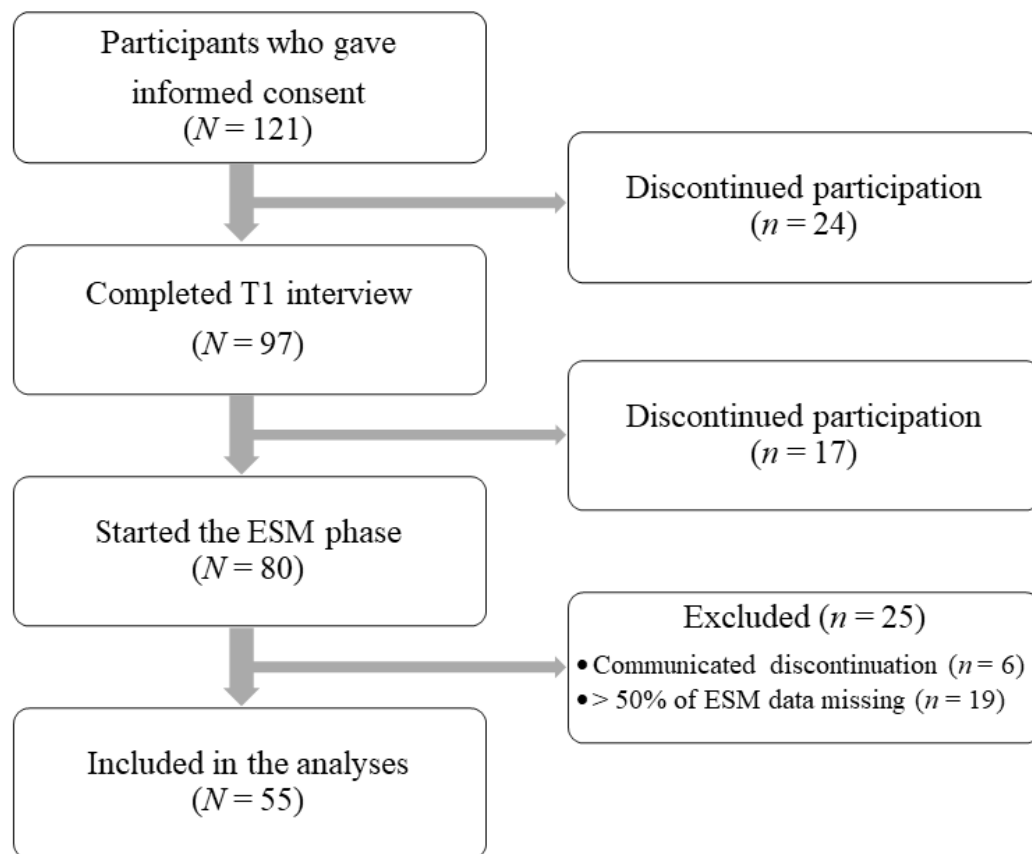
The data collection took place as part of the “Grief in daily life” study, a research collaboration of the universities of Utrecht, Twente and Groningen, led by Dr. Lonneke Lenferink. A convenience sample of 121 bereaved individuals was recruited via social (media) networks and posts on grief-related websites. Individuals were eligible if aged ≥ 18 , they had lost a partner, family member, or friend at least three months ago, were fluent in Dutch or German, and had access to a smartphone. Exclusion criteria were current or previous psychotic disorder diagnoses and suicidal risk; both were assessed at T1. Participant incentives consisted of a personalized report of results, and a lottery with one 50-euro voucher to win.

Several individuals of the initial sample ($N = 121$) discontinued participation or were excluded from the analyses. Figure 1 illustrates the participant flow. The final sample

comprised 55 participants. On average, these were middle-aged, predominantly female and well-educated (Table 1). The deceased individuals were most frequently parents, followed by grandparents and partners. The losses occurred six years ago on average and were caused by physical illness in most cases.

Figure 1

Participant Flow Chart



Dropout Analyses

Based on prior ESM research, individuals who completed less than 50% of the ESM measurements were excluded from analyses (Conner & Lehman, 2012). Included and excluded participants were compared by means of t-tests and chi-square tests on

sociodemographic and loss-related characteristics, grief cognition levels and PGD symptom levels (Table 1). The groups did not show any significant difference.

Table 1

Sociodemographic and Loss-related Characteristics of Participants at T1

Variable	Participants Included ($n = 55$)	Participants Excluded ($n = 25$)	Significance test between groups
<hr/> Sociodemographic			
Characteristics			
Age in years (M [SD])	41.1 (16.3)	44.0 (18.5)	$t(78) = 0.71$
Gender (n [%])			$X^2 (1, n = 80) = 2.30$
Male	15 (27.3)	3 (12.0)	
Female	40 (72.7)	22 (88.0)	
Other	0 (0.0)	0 (0.0)	
Education (n [%])			$X^2 (2, n = 80) = 0.53$
Primary education	0 (0.0)	0 (0.0)	
Secondary education	8 (14.5)	5 (20.0)	
Vocational training	14 (25.5)	5 (20.0)	
College/ University	33 (60.0)	15 (60.0)	
<hr/> Loss-related			
Characteristics			
Kinship to deceased person (n [%])			X^2 n/a due to low expected cell counts
Partner	6 (10.9)	4 (16)	
Child	0 (0.0)	1 (4.0)	

Variable	Participants		Significance test between groups
	Included (<i>n</i> = 55)	Excluded (<i>n</i> = 25)	
Parent	27 (49.1)	10 (40)	
Sibling	4 (7.3)	0 (0.0)	
Grandparent	10 (18.2)	6 (24.0)	
Grandchild	1 (1.8)	0 (0.0)	
Friend	2 (3.6)	0 (0.0)	
Other	5 (9.1)	4 (16)	
Age of Deceased at Death in Years (<i>M</i> [SD])	61.5 (19.5)	66.5 (19.8)	$t(78) = 1.06$
Time since Loss in Years (<i>M</i> [SD])	6.4 (6.7)	5.4 (9.3)	$t(78) = -0.57$
Cause of Death (<i>N</i> [%])			X^2 n/a due to low expected cell counts
Physical Illness	46 (83.6)	19 (76)	
Accident	0 (0.0)	1 (4.0)	
Suicide	4 (7.3)	2 (8.0)	
Homicide	1 (1.8)	0 (0.0)	
Other	4 (7.3)	3 (12.0)	
PGD Symptoms ^a (<i>M</i> [SD])	36.6 (11.6)	40.8 (14.4)	$t(78) = -0.17$
Grief Cognitions ^b (<i>M</i> [SD])	4.3 (6.8)	4.1 (6.3)	$t(78) = 1.37$

Note. Characteristics of participants included in the analyses (*n* = 55) are compared to the characteristics of participants who started the ESM phase but were excluded from analyses (*n* = 25). n/a = not applicable.

^a PGD symptom levels indicated by the total score of the TGI-CA (Range 22 – 110).

^b Grief cognition levels indicated by the total score of the GCQ-SF-modified (Range 0 – 40).

Instruments

Sociodemographic and loss-related characteristics, PGD symptom levels, and grief cognitions were assessed via the T1 interview, while fluctuations in yearning and emotional pain were assessed via the *Ethica* app.

Sociodemographic and Loss-related Characteristics

The interview entailed questions assessing gender, current age, level of education, type of kinship to deceased person, age of the deceased person at the time of death, time since loss, and the cause of death (see Table 1).

Traumatic Grief Inventory – Clinician Administered

The severity of PGD symptoms was measured using the Traumatic Grief Inventory-Clinician Administered (TGI-CA). The Traumatic Grief Inventory- Self Report Plus (TGI-SR+; Lenferink et al., 2022) was adapted for the assessment via structured interview. Participants indicated the extent to which they experienced 22 symptoms during the preceding two weeks using a 5-point Likert scale (1 = *never* to 5 = *always*). For instance, “In the last two weeks, did it feel unreal that X is dead?”, with X replaced with the appellation of the deceased used by the participant. The items assessed PGD criteria according to four diagnostic definitions, including PGD as per DSM-5-TR (APA, 2022) and ICD-11 (WHO, 2019).

A total score of PGD symptoms is calculated by summing up all items. The Dutch TGI-SR+ has shown good psychometric properties (Lenferink et al., 2022). The internal consistency in this sample was excellent ($\alpha = .91$).

Grief Cognitions Questionnaire- Short Form – Modified version

A modified version of the Grief Cognitions Questionnaire – Short Form (GCQ- SF; Doering et al., 2021) assessed negative grief cognitions. The GCQ-SF measures the degree of endorsement of negative beliefs on the self since the loss (subscale Self), the meaning of life since bereavement (subscale Life), the future without the deceased (subscale Future), and the catastrophic misinterpretations of grief symptoms (subscale Threat). For the modified version, the highest item-total correlations computed in prior research (Lenferink et al., 2020) were used to select two items per subscale. Participants were presented with eight cognitions (e.g., Since X is dead, I think I am worthless) and rated their level of agreement on a 6-point Likert scale (0 = *disagree strongly* to 5 = *agree strongly*). The number of items was reduced to limit participant burden. The modified version of the German and Dutch GCQ-SF is provided in the Appendix.

While the GCQ-SF was validated in German, only the original GCQ has been validated in Dutch (Boelen & Lensvelt-Mulders, 2005). However, prior studies have used an abbreviated Dutch version resembling the GCQ-SF (Boelen et al., 2006a; Boelen & Klugkist, 2011). A total score of grief cognitions is obtained by summing all item scores. The GCQ-SF has shown good psychometric properties (Doering et al., 2021). The modified version had excellent internal consistency ($\alpha = .91$) in this sample.

Ethica App

The specific PGD symptoms were assessed via the *Ethica* app. The single item “In the past three hours, I found myself yearning for him/her” was used to capture the current level of yearning. Current emotional pain was measured via two items: “In the past three hours, I felt sad because of his/her death” and “In the past three hours, I felt bitterness or anger because of his/her death”. The degree of agreement with the statements was rated on a 7-point Likert scale (0 = *not at all* to 6 = *strongly*). Since either anger or sadness were required as a criterion

for emotional pain, the higher score between the two responses was selected to represent the severity of emotional pain.

The development of the ESM items was based on the symptoms assessed in the TGI-SR+ (Lenferink et al., 2022). The items were constructed by the head researchers and tested on three ESM experts and three grief experts. Their feedback was elicited and incorporated in two phases: (a) cognitive interviewing - verbalizing thoughts during completion; (b) two questions per item assessing content validity (“To what extent does the item measure the symptom X?”) and ESM suitability (“To what extent is the item suitable for ESM?”). The items were refined accordingly.

Statistical Analyses

Statistical analyses were performed with RStudio (Version 2022.02.1) and SPSS (Version 27). A missing values analysis and multiple imputation were performed. Assumptions of normality, homoscedasticity, independence and linearity were checked prior to regression analyses.

To test the positive association between PGD symptom levels and grief cognitions found in prior research, the Pearson’s correlation coefficient between the total scores of the TGI-CA and the GCQ-SF-modified was computed.

The main analysis was conducted with a two-step approach. First, an estimate of the level of fluctuation in each ESM variable was calculated in R. The mean of the squared successive differences (MSSD), first introduced by von Neumann and colleagues (1941), is a measure of temporal instability (Jahng et al., 2008; Schoevers et al., 2020). It expresses the average change in intensity between two successive measurement timepoints for a given variable (Dejonckheere et al., 2019). ESM researchers have repeatedly preferred it over other variability estimates since it considers the temporal dependency of ESM data (Dejonckheere et al., 2019; Trull et al., 2008). The MSSD for n observations is given by

$$MSSD = \frac{1}{n-1} \sum_{i=1}^{n-1} (x_{i+1} - x_i)^2.$$

Second, two simple linear regression models were computed. The outcome variables, fluctuation in yearning (MSSD yearning) and fluctuation in emotional pain (MSSD emotional pain), were regressed on negative grief cognitions (GCQ-SF-modified total score). The statistical threshold was set at $p \leq .05$ (two-sided).

If the hypotheses were confirmed, patterns of fluctuations in PGD symptoms would have been inspected graphically. Plotting the ESM data of participants highly endorsing grief cognitions could have explored the idea of high and stable symptom levels in this group of bereaved individuals.

Results

Preliminary Results

Table 1 summarizes the sociodemographic and loss-related characteristics, negative grief cognitions and PGD symptom levels assessed at T1.

A missing values analysis of the dataset of included participants ($N = 55$) was performed. Results showed that 29.3% of the ESM measurements of yearning and 29.5% of the ESM measurements of emotional pain were missing. A graphical inspection of the pattern of missings pointed to their randomness. Therefore, multiple imputation (Schafer, 1999; Rubin, 1996) was performed in R using the package *mice* (Zhang, 2016). Analyses including yearning and emotional pain, and its derivatives, were performed with five imputed datasets and the results were pooled.

Assumptions for linear regression were met. The P-P plots of standardized residuals indicated a normal distribution. The scatterplots displaying the standardized residuals against the standardized predicted values showed a mostly random pattern, thereby indicating homoscedastic data. Scatterplots depicted a linear relationship between grief cognitions and MSSD levels of each ESM variable.

Correlation Results

The Pearson correlation coefficient between negative grief cognitions and PGD symptom levels was computed. Results indicated a strong positive association, $r(53) = .80$, $p < .001$, and are in line with our expectations.

Main Results

In the first step of the main analysis, the estimates of fluctuations in PGD symptoms were calculated. R yielded an MSSD for yearning ($M_{pooled} = 1.31$, $SD_{pooled} = 0.97$) and an MSSD for emotional pain ($M_{pooled} = 2.13$, $SD_{pooled} = 1.34$) for each participant.

In the second step, two simple linear regression models were computed. Negative grief cognitions significantly predicted fluctuations in yearning ($R^2_{pooled} = .26$, $F_{pooled}(1, 53) = 9.87$, $p_{pooled} = .006$). However, the standardized coefficient indicated that the direction of the relationship was contrary to the first hypothesis. Namely, participants with higher levels of grief cognitions showed higher variability in yearning ($\beta_{pooled} = .51$). Negative grief cognitions had no significant effect on fluctuations in emotional pain ($R^2_{pooled} = .09$, $F_{pooled}(1, 53) = 3.88$, $p_{pooled} = .055$). Thus, the second hypothesis was not confirmed.

Discussion

The aim of this study was to investigate the relationship between negative grief cognitions and fluctuations in yearning (Hypothesis 1) and emotional pain (Hypothesis 2) in the daily lives of bereaved individuals. While grief cognitions had a significant effect on within-person variability in yearning, there was no significant effect on the variability in emotional pain. Moreover, contrary to the expected direction, grief cognitions and yearning fluctuations showed a positive relationship. Thus, both hypotheses were not confirmed. Nonetheless, as expected, negative grief cognitions positively correlated with PGD symptom levels at T1. Following a brief contextualization of correlational findings, the main findings, the study limitations and implications are discussed.

Grief Cognitions and PGD Symptoms

The positive correlation between cross-sectional grief cognitions and PGD symptom levels found in this sample is consistent with earlier cross-sectional and non-intensive longitudinal research (Boelen et al., 2006a; Nagy & Szamosközi, 2014). Although causal conclusions cannot be drawn, these results support the role of grief cognitions as a maintaining factor of PGD, as theorized by Boelen (2006b). Further, the finding that grief cognitions positively related to yearning variability contributes to evidence suggesting an association between persistent negative thinking and daily grief-related complaints. In fact, a recent diary study with bereaved individuals found that trait worry and trait rumination positively correlated with daily negative affect (Eisma et al., 2021).

However, the lack of significance of the association between grief cognitions and fluctuations in emotional pain could not support this relationship. On the one hand, this difference between results might be explained by the greater variance of emotional pain ($M_{MSSDEmotionalPain} = 2.13$, $SD_{MSSDEmotionalPain} = 1.34$), when compared to yearning ($M_{MSSDYear} = 1.31$, $SD_{MSSDYear} = 0.97$). Since higher variance decreases the likelihood of detecting significance (Lan & Lian, 2010), the discrepancy might merely emerge due to the statistical properties of this sample. On the other hand, the incongruent outcomes might indicate that PGD symptoms do not relate homogeneously to person-related variables. The latter would contradict evidence indicating a single dimensionality of PGD symptoms (Boelen et al., 2019; Boelen & Lenferink, 2020).

Grief Cognitions and Fluctuations in PGD Symptoms

This study was the first investigating *fluctuations* in PGD symptoms through an ESM design. We expected that individuals with a risk factor for PGD, namely negative grief cognitions, would exhibit more chronic, thus less context-dependent, complaints. In this line,

individuals adaptively coping with bereavement and unaffected by negative grief cognitions would show more fluctuations in grief responses in daily life. However, in our sample, higher levels of grief cognitions were not significantly associated with lower fluctuations in PGD symptoms. Thus, the dynamic adaptation described in previous research (Bisconti et al., 2004), and proposed by the DPM through the concept of oscillation (Stroebe & Schut, 2010), was not reflected by our results.

Nonetheless, higher levels of negative grief cognitions did significantly relate to higher levels of yearning variability. Although contrary to our hypothesis, this finding is consistent with patterns observed in studies on different psychopathologies. In a broader context, ESM studies in depression, anxiety and borderline personality disorder patients show that greater overall symptom severity is associated with instability of affective symptoms in daily life (Myin-Germeys et al., 2009; Schoevers et al., 2021, Trull et al., 2008). When considering that grief cognitions are strongly related to PGD severity, the associated intraindividual yearning variability confirms these earlier ESM findings. The similarity might speak for a pattern that is not specific to PGD. Multiple mental disorders may share the positive association between severity and intraindividual variability of affective symptoms. This idea is in line with evidence supporting emotion regulation as a transdiagnostic factor (Aldao et al., 2016), and thereby suggests the integration of emotion regulation skills into treatment for PGD. However, despite qualifying as an affective symptom, emotional pain did not confirm the pattern in this sample.

Another explanation for our results lies in the sample characteristics. On average, individuals lost their significant other six years ago, and indicated low levels of PGD symptoms and grief cognitions. These features might suggest that for most participants grief played a minor role in daily life. However, the adaptive grief variability we hypothesized might refer to a limited timeframe following bereavement. In fact, the DPM focuses on the

process of *coping* with bereavement (Stroebe & Schut, 2010). Further, Bisconti and colleagues (2004) observed that adaptive within-person changes in the emotional well-being in recently bereaved spouses decayed over time. Hence, fluctuations in PGD symptoms might still reflect adaptive active coping with bereavement. Yet, in the present study, most individuals may have already experienced the dynamic part of adaptation. Thus, oscillation may occur less prominently, making it undetectable in the analyses.

Limitations and Implications

The present study provides findings on the phenomenology of grief in daily life, which represent a starting point for future research. Several limitations and implications of the study are discussed.

First, the sample characteristics depict a population that is minorly affected by grief. Thus, the positive association between negative grief cognitions and short-term fluctuations in yearning is only generalizable to a subclinical population of bereaved individuals. To understand the relation between intra- and interindividual variability in clinically significant grief, a sample including participants with different degrees of severity is warranted. Hence, future studies should replace the convenience sampling method with stratified sampling, or with a PGD vs. control design.

Second, the sample size is relatively small ($N = 55$) and despite the exclusion of participants with an insufficient number of observations, the dataset entailed numerous missing values. Thus, findings should be interpreted with caution. As typical for ESM studies, the participant burden likely contributed to the extent of missing data (Beal, 2015; Williams et al., 2021). To counter this known shortcoming, yearning and emotional pain were assessed with one and two items respectively. Despite this assessment modality being less reliable than multi-item scales, it represents a necessity in ESM studies (Eisele et al., 2022): It

accommodates for the feasibility of measurements in everyday life and reduces the participant burden. Although the gaps in data were addressed through multiple imputation, future investigations should aim for more complete ESM datasets. The possibility to customize the timepoints of assessment might decrease missings produced by personal circumstances (e.g., work hours, childcare).

Nevertheless, the study suggests the feasibility of the ESM design for bereavement research. Despite the patient burden, several interviewees reported feeling satisfied with being part of something meaningful, that could help bereaved individuals in future. Considering research suggesting the benefit of meaning making and help behaviour (Brown et al., 2008; Neimeyer, 2011), the study could have had a positive effect on some participants. Consequently, future studies should continue to investigate the relationship between person-related variables and intraindividual symptom variability via ESM.

Our results suggest that targeting grief cognitions via interventions is indicated for bereaved individuals experiencing persistent fluctuations in yearning in their everyday life. However, considering the years passed since the loss, our findings likely describe the outcome of coping, rather than the process itself. Thus, studies on fluctuations in grief reactions in the 24 months post-loss should further test oscillation as an adaptive coping mechanism. In this case, individuals adapting to the loss would be expected to exhibit a decline in symptom fluctuations after six (WHO, 2019) or 12 months (APA, 2022). Further, the idea of an association between severity and affect instability across psychopathologies should be investigated for PGD.

Moreover, the difference between results on yearning and emotional pain brings into question the homogeneity of PGD symptoms. However, research on specific symptoms is scarce. Insights from network analyses of PGD point to the relevance of differentiating

between symptoms and their impact (Robinaugh et al., 2014, 2016b). The network approach to psychopathology emphasizes symptoms as autonomous agents within a causal system, rather than passive indicators of one latent construct (Robinaugh et al., 2020). Thus, investigating the mutual influences of single PGD symptoms is another valuable avenue for future research.

Conclusion

This study provided evidence supporting the effect of negative grief cognitions on fluctuations in yearning in the daily lives of bereaved individuals. Our results showed that higher levels of grief cognitions were associated with higher levels of short-term intraindividual variability in yearning. Considering the study's limitations, these outcomes should be interpreted with caution. Nevertheless, this finding provides a starting point for multifaceted future research on the phenomenology of grief using ESM.

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Appendix

Modified Version of German Grief Cognitions Questionnaire-Short Form

Nun folgt eine Reihe negativer Überzeugungen. Bitte geben Sie an, wie sehr Sie jeder dieser Überzeugungen zustimmen. Bitte geben Sie Ihre Antwort auf einer Skala von 0 bis 5 an: 0 ist „ich stimme überhaupt nicht zu“ und 5 ist „ich stimme vollkommen zu“.

	Stimme überhaupt nicht zu	Stimme vollkommen zu
1. Seit (___) tot ist, denke ich, dass ich wertlos bin.	① ② ③ ④ ⑤	
8. Wenn ich meinen Gefühlen freien Lauf lasse, werde ich verrückt.	① ② ③ ④ ⑤	
13. Ich habe keine Zuversicht in die Zukunft.	① ② ③ ④ ⑤	
15. Mein Leben ist nutzlos seit seinem/ihrem Tod.	① ② ③ ④ ⑤	
25. Seitdem (___) gestorben ist, denke ich negativ von mir selbst.	① ② ③ ④ ⑤	
32. Mein Leben hat keinen Sinn mehr, seit (___) gestorben ist.	① ② ③ ④ ⑤	

	Stimme überhaupt nicht zu	Stimme vollkommen zu
35. Seit (___) nicht mehr da ist, habe ich eine negative Perspektive auf die Zukunft.	① ② ③ ④ ⑤	
36. Wenn ich meine Gefühle aufkommen lasse, werde ich die Kontrolle verlieren.	① ② ③ ④ ⑤	

Modified Version of Dutch Grief Cognitions Questionnaire-Short Form

Wat volgt zijn vragen over verschillende negatieve uitspraken. Wilt u bij elke uitspraak aangeven in hoeverre u het met die uitspraak eens bent? Geef uw antwoord a.u.b. op een schaal van 0 tot 5: 0 is "totaal mee oneens" en 5 is totaal mee eens".

	Totaal mee oneens	Totaal mee eens
1. Sinds (___) dood is, vind ik mezelf een waardeloos mens.	① ② ③ ④ ⑤	
8. Als ik mijn verdriet echt toelaat, dan word ik gek.	① ② ③ ④ ⑤	
13. Ik heb geen vertrouwen in de toekomst.	① ② ③ ④ ⑤	

	Totaal mee oneens						Totaal mee eens
15. Mijn leven is nutteloos sinds (___) overleden is.	①	②	③	④	⑤		
25. Sinds (___) dood is, denk ik negatief over mezelf.	①	②	③	④	⑤		
32. Mijn leven is zinloos sinds (___) overleden is.	①	②	③	④	⑤		
35. Sinds (___) er niet meer is, heb ik een negatieve kijk op de toekomst.	①	②	③	④	⑤		
36. Als ik mijn gevoelens werkelijk toelaat, dan verlies ik de controle.	①	②	③	④	⑤		