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CLINICAL RESEARCH ARTICLE

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The association between one's social life and symptoms of prolonged grief following a traumatic loss: an ecological momentary assessment study

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ABSTRACT

Background: A strong social safety net may play a key role in protecting people from developing prolonged grief disorder (PGD) after a traumatic loss. This has mainly been investigated cross-sectionally, whereby people usually report on their social life and PGD reactions during the past month. However, retrospectively recalling experiences is prone to recall bias.

Objective: As such, we investigated the associations between pleasantness of social interactions and PGD reactions in traumatically bereaved people using Ecological Momentary Assessment (EMA).

Methods: People whose loved one died due to homicide, suicide, or accident at least 12 months earlier ($N = 36$, 78% women, $M_{age} = 56$, 47% met PGD criteria) received smartphone-based surveys five times per day for two weeks. Surveys included questions about PGD intensity (e.g. 'In the past 3 hours, did you yearn for your loved one?' 0 = not at all, 6 = extremely) and their quality of social life (e.g. 'In the past 3 hours, how did you find being with others?' 0 = very unpleasant, 6 = very pleasant). Linear mixed models were used.

Results: Based on 2520 measurement occasions, we found that when a person enjoyed their social life more than usual, they grieved less ($B = -0.141$, $SE = 0.020$, $p < .001$). However, whether a person's social life was more or less pleasant than their peers was not related to their PGD levels.

Conclusions: This EMA study highlights the importance of accounting for individual variability in grief reactions after loss and highlights the potential utility of strengthening one's social safety net as a way to reduce the burden of PGD.

La asociación entre la vida social personal y síntomas de duelo prolongado tras una pérdida traumática: un estudio de evaluación ecológica momentánea

Antecedentes: Una sólida red de seguridad social puede desempeñar un papel clave en la protección de las personas contra el desarrollo del trastorno de duelo prolongado (TDP) tras una pérdida traumática. Esto ha sido investigado principalmente de forma transversal, donde las personas suelen informar sobre su vida social y reacciones al TDP durante el último mes. Sin embargo, el recuerdo retrospectivo de experiencias es propenso a sesgos de recuerdo.

Objetivo: Por lo tanto, investigamos las asociaciones entre la satisfacción de las interacciones sociales y las reacciones al TDP en personas en duelo traumático mediante la Evaluación Ecológica Momentánea (EEM).

Métodos: Personas cuyo ser querido falleció por homicidio, suicidio o accidente al menos 12 meses antes (N=36, 78% mujeres, Edad media=56, 47% cumpliendo criterios de TDP) recibieron encuestas a través de teléfonos inteligentes cinco veces al día durante dos semanas. Las encuestas incluyeron preguntas sobre la intensidad del TDP (p. ej., ¿extrañó a su ser querido en las últimas 3 horas? 0=nada, 6=extremadamente) y su calidad de vida social (p. ej., ¿cómo encontró el estar con otras personas en las últimas 3 horas? 0=muy desagradable, 6=muy agradable). Se utilizaron modelos lineales mixtos.

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Grief; trauma; bereavement; loss; Ecological Momentary Assessment; experience sampling; social

PALABRAS CLAVE
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HIGHLIGHTS

- The link between one's social life and prolonged grief reactions was examined using ecological momentary assessment in traumatically bereaved people.
- We found that when people perceived their social interactions or time spent alone to be more pleasant than usual, they grieved less.
- Also, when people were in the presence of others, they grieved less.
- Strengthening one's social safety net after traumatic loss seems clinically useful.

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Resultados: Con base en 2.520 mediciones, observamos que cuando una persona disfrutaba de su vida social más de lo habitual, experimentaba menos duelo (B=−0,141, EE=0,020, *p* <0,001). Sin embargo, el hecho de que la vida social de una persona fuera más o menos placentera que la de sus compañeros no se relacionó con sus niveles de TDP.
Conclusiones: Este estudio de EEM destaca la importancia de tener en cuenta la variabilidad individual en las reacciones de duelo tras una pérdida y destaca la potencial utilidad de fortalecer la red de seguridad social para reducir la carga del TDP.

Grief is a natural response to loss. While everyone responds to loss in different ways, the severity and intensity of common grief symptoms tend to decrease over time for most people (Nielsen et al., 2019). Yet, for people with prolonged grief disorder (PGD; American Psychiatric Association [APA], 2022; World Health Organisation [WHO], 2018), grief symptoms persist and impair daily life at least 6 months (in ICD-11), or 12 months (in DSM-5-TR), after the loss. A PGD diagnosis requires the presence of at least one of two separation distress symptoms (i.e. intense yearning for the deceased and/or preoccupation with the deceased) and the presence of accompanying cognitive (e.g. difficulty accepting the death), emotional (e.g. emotional numbness), or behavioural symptoms (e.g. avoidance of loss-reminders). While the number and content of accompanying symptoms slightly differ between ICD-11 and DSM-5-TR criteria-sets (Eisma et al., 2022), recent estimates suggest that the lifetime prevalence of PGD is between 3.3 and 4.7% (Rosner et al., 2021; Treml et al., 2022). However, traumatic and unexpected loss (e.g. violent and/or unnatural death) is a notable risk factor for PGD (Buur et al., 2024), associated with a four times greater likelihood of developing PGD compared to those who experienced an expected loss (Doering et al., 2022). Given this, it is critically important to identify and investigate the factors that may aid in one's recovery following a traumatic and unexpected loss.

An individual's social life may be one such factor that influences PGD. Social life refers to the quality and quantity of social interactions one encounters in daily life (Stadel et al., 2024). The micro-sociological theory of adjustment to loss suggests that the physical separation that occurs when losing a loved one creates a social void that needs to be filled through social interactions in order to adjust to life after loss (Maciejewski et al., 2022). Despite the suggested impact bereavement has on one's social life, there is a notable gap in the grief literature investigating whether one's social life after losing a significant person is related to PGD symptoms. For instance, one systematic review concluded that better social support is related to better mental health after traumatic loss (Scott et al., 2020). Yet, another systematic review and meta-analysis concluded that such inferences cannot be drawn due to too few studies examining this possible link (Buur et al., 2024).

However, the wider mental health literature has robustly identified the crucial role of one's social life in shaping mental health outcomes (Kirkbride et al., 2024). For instance, the stress-buffering theory posits that positive social interactions protect from the damaging impact of stress, operating as a protective buffer between stressful situations and stress reactions, while adverse social interactions or a lack of social contact negatively impacts mental health (Cohen & Wills, 1985). Similarly, social causation theory posits that social resources may promote wellbeing, while a lack of social resources may lead to psychological distress (Johnson et al., 1999). Lastly, social selection theory postulates that psychological distress might erode social resources as distressed individuals may begin to withdraw from social activities and find it difficult to accept the support of others (King et al., 2006).

Emerging evidence in support of these social theories has been established in the context of posttraumatic stress disorder (PTSD) and depression (Elmer et al., 2023; Wang et al., 2021; Wickramaratne et al., 2022); two disorders that are often comorbid with PGD, particularly after traumatic loss (Heeke et al., 2019; 2023; Komischke-Konnerup et al., 2021; Schaal et al., 2021). This empirical work highlights that both a reduced *quantity* of social interactions (often operationalised as social isolation and reduced social connectedness) and a reduced *quality* of social interactions (often expressed as pleasantness of social interactions or the presence of conflict) are associated with worsening of psychopathology symptoms (Elmer et al., 2023; Liu et al., 2019; Wickramaratne et al., 2022). However, reduced *quality* of social interactions, rather than reduced *quantity*, was found to be most strongly associated with the progression of depressive symptoms (Elmer et al., 2023). Accordingly, improving one's social life, particularly its quality, may be a fruitful clinical target in treatments for psychological disorders, including PGD (Kirkbride et al., 2024). Consequently, to refine interventions for PGD, we first need to examine further whether one's social life is related to PGD.

As one's social interactions happen in daily life, research methodology should also occur in daily life. Ecological Momentary Assessment (EMA), also termed Experience Sampling Methodology (Stadel et al., 2024), is one methodology well suited to investigating phenomena occurring in daily life. In EMA studies, participants typically report their thoughts,

feelings, and behaviours multiple times a day over several days or weeks, capturing experiences as they naturally occur in everyday life. This approach minimises recall bias – a common issue in cross-sectional or longitudinal retrospective reporting, where people may inaccurately recollect experiences (Myin-Germeys et al., 2018; Shiffman et al., 2008). For instance, a recent EMA study found that retrospective reporting led to an overestimation of PGD symptoms compared with momentary assessment (Lenferink, van Eersel, et al., 2022). Thus, EMA may provide a more accurate measure of PGD severity.

Moreover, EMA allows for the examination of both within- and between-person associations (Kraiss et al., 2023; Shiffman et al., 2008). While cross-sectional studies are only able to test between-persons associations, such as whether people who report lower overall quality of social life also report greater PGD symptoms, EMA data analysed using analytic approaches such as multilevel modelling can facilitate investigation of within-person processes (Kraiss et al., 2023; Myin-Germeys et al., 2018). Here, within-person associations are explored by analysing the variability around each individual's mean (Hamaker et al., 2007). This allows one to determine, for example, whether an individual's higher-than-usual rating of social life is also associated with fewer PGD symptoms at the same time point. Considering that social life may differ both between and within individuals, EMA's ability to capture both processes offers a fruitful avenue to advance our understanding of social life and PGD symptoms. Despite these advantages, research using EMA to assess PGD symptoms, or investigate the influence of one's social life, remains limited (but see Aeschlimann et al., 2024; Lenferink, van Eersel, et al., 2022; Mintz et al., 2024; Pociūnaitė-Ott et al., 2024).

A small number of prior EMA studies with bereaved people have demonstrated the viability and usefulness of this methodology to investigate PGD (Aeschlimann et al., 2024; Lenferink, Terback, et al., 2024; Lenferink, van Eersel, et al., 2022; Mintz et al., 2024). Of greatest relevance, a study by Pociūnaitė-Ott and colleagues (2024) found a relationship between momentary differences in PGD symptoms and momentary differences in one's social life. Specifically, social interactions were found to buffer certain PGD symptoms, such as preoccupation with the loss, but only when these interactions were perceived as pleasant (Pociūnaitė-Ott et al., 2024). Although the literature is in its infancy, such studies indicate the potential protective role of one's social life for PGD symptoms.

Despite these advances, insights from past EMA studies, including Pociūnaitė-Ott et al.'s (2024) study, were based on samples comprising (primarily) people whose loved one died due to a natural cause (i.e. illness). It is possible, however, that the relationship between social life and PGD symptoms may differ for traumatically bereaved people, as prior research suggests that experiencing a violent loss, particularly a suicide-related loss, may make stigma and insensitive responses from one's social environment more likely (Heeke et al., 2019). Moreover, Pociūnaitė-Ott et al.'s study was conducted among a sample of which the majority of people did not meet the PGD criteria, so it remains unclear to what extent such findings may generalise to people with elevated PGD symptoms. Therefore, research is needed to examine whether one's social life is associated with PGD symptoms among traumatically bereaved people with elevated PGD symptoms.

To address these gaps in the extant literature, the current study aimed to examine the within- and between-person associations between one's social life and PGD symptoms using EMA. In line with prior research (Elmer et al., 2023; Liu et al., 2019; Pociūnaitė-Ott et al., 2024), we predicted that increased pleasantness of one's social interactions would be associated with less PGD severity. Moreover, as participants are unlikely to be in the presence of others at all times during their daily life, a secondary aim of our study was to verify whether the association between pleasantness of daily life and PGD symptoms is moderated by whether a participant was alone or with others. In line with prior research (Wickramaratne et al., 2022) we anticipated that being alone, compared to being with others, would reduce the strength of the association between pleasantness of daily life and PGD symptoms.

1. Methods

1.1. Participants

Participants were recruited from a Dutch website (www.rouwbehandeling.nl). This website provides psychoeducation on grief and information about grief treatment. People who access this website can also complete a screening tool for PGD, i.e. the Traumatic Grief Inventory-Self Report Plus (TGI-SR+; Lenferink, Eisma, et al., 2022). Dutch adults who completed this screening tool were eligible for the present study if they (a) experienced the loss of a significant person due to an accident, homicide, or suicide at least 12 months earlier, (b) met PGD DSM-5-TR criteria, determined by a score of at least 71 on the TGI-SR+ (Lenferink, Eisma, et al., 2022), and (c) provided consent to be contacted for future research. People who completed a self-monitoring tool for PGD between March 2022 and May 2024 and met our inclusion criteria were invited via email between April and June 2024 to participate in this study. Of these, 70 people participated in the EMA phase of the study. Figure 1 depicts participant exclusions during the recruitment, screening, and data collection phases of the study.

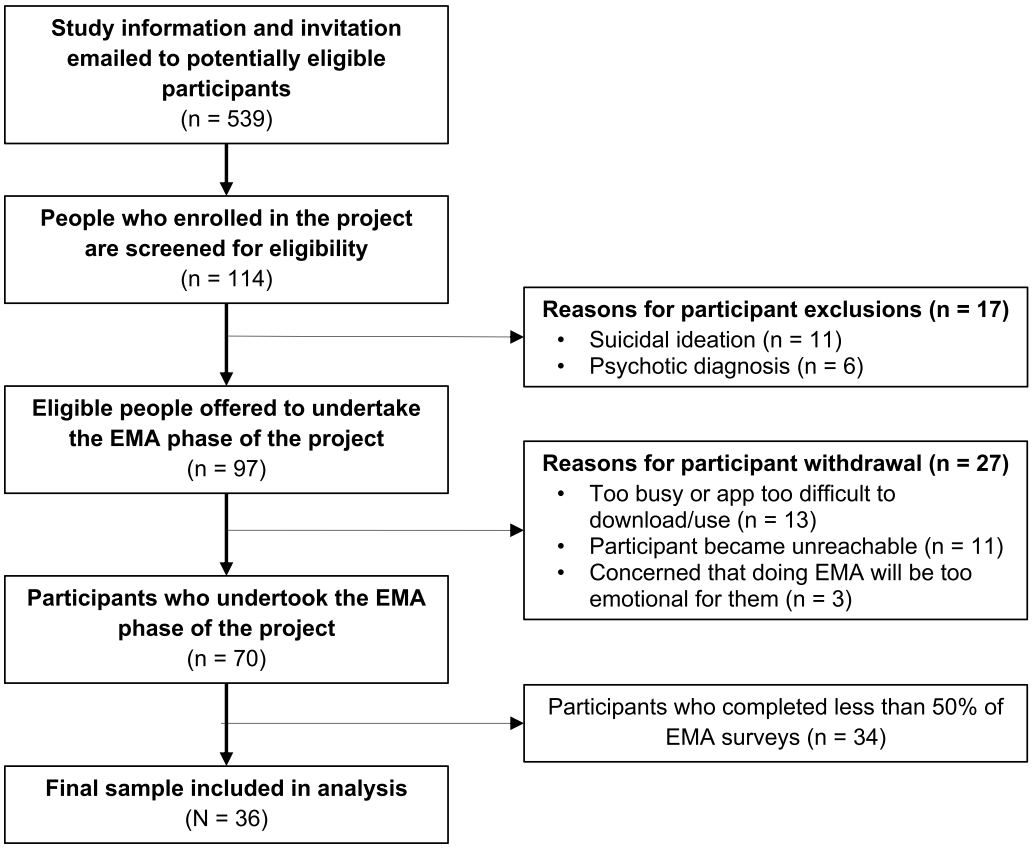


Figure 1. Flowchart depicting participant exclusions during the recruitment, screening and data collection phases of the study.

1.2. Procedure

After signing informed consent, participants completed an online baseline survey. Then, participants were emailed video instructions on how to download and use the Avicenna Research app (formerly known as Ethica) to complete the EMA phase. Consistent with prior research (Lenferink, van Eersel, et al., 2022; Schoevers et al., 2021), the EMA data collection phase lasted two weeks (14 days) in which beeps (notifications) were sent to participants five times per day asking them to complete the EMA questionnaire. These beeps were sent semi-randomly (i.e. between 8:30am–9:30am, 11:30am–12:30pm, 2:30pm–3:30pm, 5:30pm–6:30pm and 8:30pm–9:30pm). Participants had 60 min to complete each EMA questionnaire. A reminder was sent after 10 and 20 minutes. If more than three notifications were missed in a row, participants were contacted by research assistants to encourage them to participate in the study. Each questionnaire was about 2-min long (consisting of a maximum of 24 items). About one month after completing the EMA data collection phase, another online survey was completed. For this study, we analysed data from the baseline survey and EMA questionnaires only. The dataset used in the present study is part of a larger data-archive on grief in daily life called Grief-ID (further details and links are provided in the Data Availability Statement). This study obtained ethical approval by an ethics committee from the University of Twente, the Netherlands (ID: 240186). Participants did not receive any monetary reimbursement for their participation but could elect to receive an individualised report of their responses.

1.3. Measures

1.3.1. PGD symptoms assessed using EMA

PGD symptom severity in daily life was assessed using aggregated scores on the 2-item PGS-Short Ecological Assessment (PGS-SEA) scale (Ergun et al., 2025). PGS-SEA items were developed using input from experts (Lenferink, van Eersel, et al., 2022). One item reads: 'In the past three hours, I felt sad because of his/her death.' The second item reads: 'In the past three hours, I found myself yearning for him/her.' Participants rated these items on 7-point scales with anchors 0 = *not at all* and 6 = *very much*. These items have shown good psychometric properties (Ergun et al., 2025).

1.3.2. Social life assessed using EMA

At each measurement occasion people rated their social life in the past three hours. First, they answered a question regarding the type of social contact, 'Were you with other people?', with answer options 1 = *yes, with one other person*, 2 = *yes, with multiple others*, or 3 = *no, I was alone*. Participants were advised to select the response option that best reflected the

majority of the preceding period. Subsequently they rated the pleasantness of their social life by answering either: 'How did you find the contact?' (for those who answered 1 or 2 on the prior question) or 'How did you like being alone?' (for those who answered 3 on the prior question), where 0 = *very unpleasant*, 6 = *very pleasant*. These items were based on prior research (Bastiaansen et al., 2018).

1.3.3. PGD symptoms assessed at baseline

The 22-item TGI-SR + (Lenferink, Eisma, et al., 2022) was used to assess baseline prolonged grief severity, as defined by DSM-5-TR and ICD-11, in the past month. Participants rated to what extent they experienced each symptom during the past month on 5-point scales ranging from 1 = *never* to 5 = *always*. An example item is: 'In the past month, I felt that moving on (e.g. making new friends, pursuing new interests) was difficult for me'. A summed TGI-SR + score of 71 or higher is indicative of probable PGD (Lenferink, Eisma, et al., 2022). The TGI-SR + has shown to have good psychometric properties across various languages and diverse samples (Cherblanc et al., 2024; Kokou-Kpolou et al., 2022; Lenferink, Eisma, et al., 2022; Lenferink, Johnsen, et al., 2024; Lenferink, van Dijk, et al., 2024). Cronbach's alpha level in the current study was .89.

1.4. Statistical analyses

Multilevel mixed models, conducted using R Version 4.4.1 (R Core Team, 2022), were used to analyse the data. Multilevel mixed models are well suited to the nested structure of longitudinal data (Singer & Willett, 2003). The nlme package was used (Bates et al., 2015; Pinheiro & Bates, 2022). Consistent with prior research (Conner & Lehman, 2012; Kraiss et al., 2023), those who completed at least 50% of EMA data were included in the analyses (see Figure 1). In the current study, 36 participants met this threshold. This yielded a final dataset of 2,520 measurement occasions and 1896 completed observations. The ICC for PGD symptom severity (mean sadness and yearning score) was 0.66, indicating that 66% of the variance in PGD symptom severity was between people. Accordingly, two-level multilevel mixed models were computed, with observations (level 1) nested within participants (level 2).

First, a model was built to investigate the relationship between perceived pleasantness and PGD symptom severity in daily life. PGD symptom severity (indexed using the mean PGS-SEA score) was entered as the dependent variable.[1] In this model, within- and between-person associations were separated (Bolger, 2013; Curran & Bauer, 2011; van de Pol & Wright, 2009). Specifically, person-mean centreing was used to index an individual's variation around their own mean (i.e. within-person variability). This is computed by first calculating each participant's mean pleasantness score across all observations. Next, the participant's person-mean was subtracted from each observation to yield a person-mean centred score for each measurement occasion. Conversely, grand-mean centreing is used to index between-person variability in overall (time-invariant) pleasantness scores. This is computed by subtracting the sample's grand mean score of pleasantness from each participant's overall pleasantness mean score. This yields a time-invariant grand-mean centred pleasantness score for each participant. Accordingly, time-varying person-mean centred (within-persons) and time-invariant person-mean (between-persons) pleasantness variables were entered as independent variables in the model.

A second model was built to explore whether being alone or being with others moderated the relationship between within-person pleasantness and PGD symptom severity in daily life. This model was identical to our first model, with the addition of the dummy coded moderator variable (0 = alone, 1 = with others) and an interaction term (within-persons pleasantness scores multiplied by the moderator).

In both models, the fixed effects represent the average influence of pleasantness and type of social contact across all participants in the dataset, while accounting for group-level or random variability through the inclusion of random effects. Both models used restricted maximum likelihood and included random intercepts. Finally, as is common practice when analysing time series data, a first-order autoregressive (AR) covariance matrix was specified. This covariance structure was used to account for the fact that observations that are closer together are more correlated than those further apart (Kraiss et al., 2023). Information on how to access the dataset used in the present study, alongside the analysis code, is outlined in the Open Practices Statement.

2. Results

2.1. Sample characteristics

Table 1 presents the demographic and loss-related characteristics of the analysed sample. The majority of participants identified as a woman and had obtained tertiary education. The most common loss was of a child, and the most common cause of death was suicide. Regarding social contextual factors, participants were more commonly in the presence of others (56% of all measurement occasions) than alone (44%). Overall, people rated the pleasantness of being with others as $M = 4.03$ ($SD = 1.43$) and the pleasantness of being alone as $M = 4.34$ ($SD = 1.25$). The mean pleasantness ratings and frequency

Table 1. Sample characteristics ($N = 36$).

Demographic and loss characteristics	
Gender, *N (%)*	
Woman	28 (78)
Man	8 (22)
Other	0 (0)
Age (in years), *M (SD)*	56.03 (9.82)
Education, *N (%)*	
Tertiary education	21 (58)
Other	15 (42)
Cause of death, *N (%)*	
Suicide	20 (56)
Accident	14 (39)
Homicide	2 (5.6)
Kinship, the deceased is my … , *N* (%)	
Child	17 (47)
Parent	3 (8)
Partner	7 (19)
Sibling	5 (14)
Other	4 (11)
Age of the deceased person, *M (SD)*	
Overall	34.83 (17.58)
When child was the deceased person	24.41 (12.40)
When parent was the deceased person	72.00 (4.24)
When partner was the deceased person	51.33 (6.71)
When sibling was the deceased person	40.60 (11.50)
When other was the deceased person	33.75 (11.95)
Time since loss (in months), *M (SD)*	84.50 (131.31) Median: 46.00 (range: 13.00–571.00)
Currently receives help from a psychologist, therapist or psychiatrist, regarding the death of loved one, *N (%)*	16 (44)
PGD (at baseline), *M (SD)*	69.89 (12.81) Median: 70.00 (range: 49.00–97.00)
Probable PGD, *N (%)*	17 (47%)

Note: PGD = Prolonged Grief Disorder.

of observations for time spent alone or with others, specifying the different types of relationships (e.g. partner, friend etc), are presented in Supplemental Table A. Participants who completed more than 50% of the EMA surveys did not significantly differ from participants who did not in terms of demographic or loss-related characteristics (see Supplemental Table B).

2.1.1. Within- and between-person associations between perceived pleasantness of daily life and PGD severity

The findings from all multilevel models are summarised in Table 2. On the between-person level, we found that pleasantness of social life was unrelated to PGD severity ($B = -0.213$, $p = .454$). On the within-person level, we found a negative association between pleasantness ratings and PGD symptom severity ($B = -0.141$, $p < .001$). Taken together, this means that when, on average, one's social life was perceived as more or less pleasant than their peers, this was not related to PGD intensity. However, when a person found their social life more pleasant than usual, they grieved less.

2.1.2. Being alone versus being with others did not moderate the association between perceived pleasantness of daily and PGD severity

When adding type of contact (i.e. being alone vs. being with others) as moderator, we found that the between-person differences in pleasantness remained unrelated to PGD severity ($B = -0.216$, $p = .450$), while within-person increases in pleasantness remained significantly associated with decreases in PGD symptom severity ($B = -0.148$, $p < .001$). In addition, being in contact with others (compared to being alone) was significantly associated with lower PGD symptom severity ($B = -0.024$, $p = .010$). However, the interaction term between pleasantness and type of contact was not significant ($B = 0.007$, $p = .430$). This suggests that the association between pleasantness and PGD severity did not significantly differ depending on whether people were with other(s) or alone.[2]

3. Discussion

The current study provides the first empirical evidence from a naturalistic daily life setting that pleasantness

Table 2. Within and between-persons associations between pleasantness of social life and PGD severity (Model 1) and the possible moderating effect of being alone versus with others (Model 2) ($N = 36$ participants, 2520 measurement occasions).

	Estimate	SE	*t*-value	95% CI (Lower, Upper)		*p*	Random Intercept Variance	Residual Variance
Model 1							2.168	1.102
Intercept	2.351	0.247	9.502	1.865	2.836	<.001		
Pleasantness of social life (within-person variations)	−0.141	0.020	−6.044	−0.187	−0.095	<.001		
Pleasantness of social life (between-person variations)	−0.213	0.283	−0.758	−0.788	0.360	0.454		
Model 2							2.161	1.102
Intercept	2.396	0.248	9.667	1.912	2.878	<.001		
Pleasantness of social life (within-person variations)	−0.148	0.030	−4.968	−0.206	−0.089	<.001		
Pleasantness of social life (between-person variations)	−0.216	0.282	−0.765	−0.789	0.357	0.450		
Alone vs. with others	−0.024	0.009	−2.573	−0.042	−0.005	0.010		
Pleasantness (within-person variations) * Alone vs. with others	0.007	0.009	0.790	−0,012	0.025	0.430		

Note: Model fit statistics: Model 1: AIC = 5597, BIC = 5630, logLik = −2792; Model 2: AIC = 5608, BIC = 5652, logLik = −2796.

of one's social interactions is related to PGD severity. Specifically, as expected, we found a significant within-person effect: when a person rated the pleasantness of their social life higher than usual, they grieved less. However, unexpectedly, we did not find support that people with higher overall pleasantness ratings, relative to others, grieved less (i.e. we did not find evidence of a between-person effect). These findings illustrate that within-person effects do not necessarily imply between-person effects, or vice versa. Additionally, while participants grieved less when they were around others compared to being alone, variation in the type of social contact (i.e. being alone versus with others) did not significantly moderate the relationship between pleasantness of social life and PGD severity.

A key finding of the present study is that within-person increases in perceived pleasantness of one's social life were associated with decreased PGD. This finding highlights that more pleasant social interactions are related to fewer grief reactions in daily life and thus accords with the stress-buffering hypothesis, which argues that positive social interactions can be protective against mental illness (Cohen & Wills, 1985). Moreover, our finding supports existing research that emphasises the role of good quality social interactions in improving mental health. Prior research on depression has argued that supportive social environments may reduce mental health issues (Elmer et al., 2023). Wickramaratne et al. (2022) found that the frequency of social visits and confiding in others significantly predicted lower depression rates. Relatedly, Howe and Dworkin (2024) observed that greater quantity and pleasantness of social interactions following traumatic events, like sexual assault, were associated with reduced posttraumatic stress symptoms. Our findings extend existing research by highlighting how the pleasantness of one's social life is related to grief. Specifically, when participants perceived their social life as more pleasant than usual, they grieved less. This might suggest that positive social experiences are a protective factor in the management of grief, as is the case for other mental health symptoms (Elmer et al., 2023).

Despite extensive research on the associations between social factors mental health, the predominant use of cross-sectional designs has precluded most studies from disentangling whether this relationship is largely a within- or between-person effect. Our study addresses this gap, using EMA to reveal that within-person increases (rather than between-person differences) in the pleasantness of social life was related to lower PGD severity. This finding is noteworthy, as it suggests that the impact of social life on grief is idiosyncratic and dynamic, and that within-person effects do not necessarily generalise to between-person effects. Our findings suggest that how an individual perceives their social life from moment-to-moment plays a more crucial role in grief intensity than stable, between-person differences in the pleasantness of social life. This aligns with literature suggesting that perceptions of (or lack of) social interactions are unique variables within each person (Platt et al., 2014). Our study thus provides a novel update to existing cross-sectional literature and highlights the importance of using methodologies, like EMA, to capture the dynamic nature of symptomatology and social life to provide a more nuanced picture of the context-specific nature of grief.

It is also noteworthy that participants in our study grieved less when they were in the presence of others, compared to when they were alone.[3] This finding accords with prior research highlighting the positive impact of social contact on mental health outcomes (Wickramaratne et al., 2022). Moreover, in line with the micro-sociological theory of adjustment to loss (Maciejewski et al., 2022), this finding suggests that pleasant social interactions following a loss might serve to mitigate the social void caused by the loss of a loved one. It was interesting, however, that being alone, compared to being in the presence of others, did not dampen the effect of perceived pleasantness on PGD symptoms for our sample. Although tentative, the lack of a moderation effect might indicate the presence of other mechanisms through which social contact buffers PGD symptoms. While enhanced positive affect/pleasantness (or reduced negative affect/unpleasantness) may partially explain the beneficial effect of social interactions (Liu et al., 2019), other potential mechanisms may be relevant. For instance, social interactions may also serve other functions, such as providing a distraction or a 'break' from grief. Alternatively, social contact, particularly with those who knew the deceased person, may be a source of validation of the individual's grief. As the present study only assessed social interactions in terms of their perceived pleasantness, we have limited information to discern why social interactions were beneficial to our participants. Future research that measures the nature and content of social interactions in daily life may provide helpful insight into the mechanisms through which social life may be dampening grief symptoms. This could involve measuring the warmth of the interaction, the content (i.e. what is discussed) and, if relevant, acknowledgement of the bereaved individual's feelings (Alisic et al., 2017; Elmer et al., 2023). This information would be informative, as social interactions have the potential to be helpful (i.e. when facilitating behavioural activation and emotional processing) or unhelpful (i.e. when serving as a painful reminder of the loss and/or fostering further avoidance).

Findings from the present study should be interpreted in the context of its limitations. First, the

present study was conducted with traumatically bereaved people residing in the Netherlands. Given the socio-cultural nature of one's social life, it is unclear how our present findings might generalise to samples from other countries or samples with different loss characteristics (such as those who are not grieving a traumatic loss). Second, while our study was longitudinal, our analysis did not test temporal associations between social life and PGD. Thus, we cannot infer causality or definitively conclude whether our findings provide support for social causation or social erosion models (Cohen & Wills, 1985; King et al., 2006). Further investigations using lagged analyses could advance this area of inquiry (for examples see: Houben et al., 2024; Schenker et al., 2023). Relatedly, a potential limitation of the present study was that participants were not able to indicate whether they encountered a combination of time spent with others and time spent alone in a single survey period. As survey windows were approximately three hours apart, it is plausible that people spent time with others as well as time alone during this time. Future studies would benefit from (a) using more frequent assessments, (b) assessing symptoms and social contact 'at the moment' rather than 'over the past 3 hours', and/or (c) asking participants to report the amount of time (i.e. hours, minutes) over the past 3 hours they spent with others or alone (as used by Battaglini et al., 2021). Finally, due to the limited sample size, subgroup analyses were not possible. It therefore remains to be explored whether the relationship between social life and PGD symptoms differs depending on background demographics (e.g. gender) and loss-related characteristics (e.g. cause of death). The present study's small sample size and relatively low retention rate (i.e. only 36 of the 70 participants completed 50% or more surveys) was likely attributable to the use of passive recruitment methods (via an email invitation) and lack of monetary reimbursement for participation. Future research could improve upon this by using active recruitment methods (e.g. follow-up emails and calls from the research team), increased contact with the research team (e.g. in-person/telephone baseline interviews and EMA set-up) and monetary incentives that are tied to the number of surveys completed (Vachon et al., 2019).

Notwithstanding these limitations, the findings of the present study are relevant to current treatment practices for PGD in several key ways. The finding that participants grieved less when they perceived their social life as more pleasant than usual accords with cross-sectional and longitudinal survey-based research (e.g. Smith et al., 2020) and offers empirical support for the clinical practice of focusing on existing social connections in bereaved people. For example, Prolonged Grief Therapy (PGT; Shear et al., 2005; 2016) includes strengthening of social relationships as a core feature of the treatment. In PGT, the patient is asked to invite an important person to session three, with the explicit goal of strengthening social connections. They are also encouraged to reconnect with individuals they may be avoiding because they remind them of the loss. Other cognitive–behavioural treatments (CBTs) for PGD also focus on strengthening one's social life (Rosner et al., 2011) and can also include inviting a close person to join part of the treatment to discuss how to best support the bereaved person (Lenferink et al., 2016; Reitsma et al., 2021; van Denderen et al., 2018).

Integrating EMA in current practice could possibly strengthen the effects of these current evidence-based PGD treatments. First, simply monitoring PGD symptoms may provide insights for the patient and reduce symptomatology (Franzen & Lenferink, 2024). Second, monitoring of symptoms and social interactions in daily life can provide unique insights for the patient and therapist. For example, symptom monitoring in daily life could reveal a connection between pleasurable social interactions and lower grief symptoms, which in turn can motivate the patient to continue incorporating social interactions in their daily life (Kramer et al., 2014). Conversely, symptom monitoring can also reveal that certain social interactions are less supportive or pleasurable, which can empower the patient to distance themselves from these situations or people. In this way, there may be utility in adopting an individualised treatment approach where clinicians emphasise engagement in pleasurable social activities and enhance the patient's ability to determine what type of social interactions are most effective in bringing about benefits. Indeed, this aligns with the principles of trauma-focused CBT, which emphasise the importance of individualised case formulation (Wild et al., 2023). Third, providing interventions in daily life, beyond simply monitoring symptoms, affirms the utility of existing treatment components, such as 'rebuilding your life' activities in trauma-focused CBT (Wild et al., 2023), and offers a potential avenue to further enhance treatment. Such interventions are known as Ecological Momentary Interventions (EMI) and are delivered via smart phones paired with extensive individual EMA data (Schueller et al., 2017). Review of EMA data paired with clinician feedback as an EMI has been found to be helpful for those with depression (Kramer et al., 2014). As such, EMI may be a helpful adjunct to consider in the treatment of PGD.

To conclude, the current study used EMA to investigate the association between social life and PGD reactions in the daily lives of traumatically bereaved people. Our study was the first to demonstrate a link between pleasantness of social interactions and PGD in daily life. Importantly, this relationship occurred at the within-person level, such that when people

perceived their social life to be more pleasant than usual, they grieved less. Conversely, differences in overall social life pleasantness, compared to one's peers (i.e. between-persons differences), were not significantly related to PGD. Finally, being in the presence of others was associated with lower PGD symptom severity. Taken together, these findings offer important theoretical, methodological, and clinical implications; highlighting the importance of accounting for idiosyncratic and dynamic variability in social life and grief reactions as well as verifying the clinical utility of strengthening one's social safety net in the treatment of PGD.

Notes

1. For the present study, PGD symptom severity was indexed using the mean of two core PGD items (yearning and sadness). We conducted multilevel models for each PGD symptom separately (i.e., one model to test the association between pleasantness and yearning, and another model to test the association between pleasantness and sadness). However, we elected to use a combined variable for yearning and sadness because (a) these symptom items were strongly correlated ($r = 0.861$, $p < .001$), and (b) separate models did not yield meaningfully different patterns of results.
2. An additional exploratory analysis, requested by one of the reviewers, was conducted to test whether social contact with a single person vs multiple people & with a single person vs being alone was differentially related to PGD symptoms and perceived pleasantness. Compared to being with a single person, being with multiple people was associated with lower PGD symptoms ($B = -0.170$, $p = .014$), while being with a single person or being alone was not differentially associated with PGD symptoms ($B = 0.001$, $p = .994$). Furthermore, type of social contact (i.e., being with a single person vs multiple people or being with a single person vs being alone) did not moderate the relationship between perceived pleasantness and PGD symptoms ($B = -0.045$, $p = .496$ & $B = -0.089$, $p = .144$, respectively). See Supplemental Table C for a summary of this analysis.
3. Exploratory analysis (presented in Supplemental Table C) further indicates that this effect was most strongly evident when participants were in the presence of multiple people (rather than a single person).

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Data availability statement

The dataset used in the present study is available on a permanent third-party repository and part of a larger data-archive on grief in daily life called Grief-ID (Lenferink & Pociūnaitė-Ott, 2025, Grief in Daily life Archive (Grief-ID Archive), DANS Data Station Social Sciences and Humanities, V1, https://doi.org/10.17026/SS/LNFAXI), where its accompanying data dictionary and full list of measures can also be found (see also, Pociūnaitė-Ott & Lenferink, 2024, A FAIR intense longitudinal data archive on prolonged grief in daily life, https://doi.org/10.13140/RG.2.2.12452.80004). The data analysis code used for this article is available in the supplementary materials.

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References

Aeschlimann, A., Gordillo, N., Ueno, T., Maercker, A., & Killikelly, C. (2024). Feasibility and acceptability of a mobile app for prolonged grief disorder symptoms. *Clinical Psychology in Europe*, *6*(1), 1–23. https://doi.org/10.32872/cpe.10881

Alisic, E., Gunaratnam, S., Barrett, A., Conroy, R., Jowett, H., Bressan, S., Babl, F. E., McClure, R., Anderson, V., & Mehl, M. R. (2017). Injury talk: Spontaneous parent-child conversations in the aftermath of a potentially traumatic event. *Evidence Based Mental Health*, *20*(4), e19–e20. https://doi.org/10.1136/eb-2017-102736

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders (DSM-5-TR)*. American Psychiatric Association Publishing. https://doi.org/10.1176/appi.books.9780890425787.

Bastiaansen, J. A., Meurs, M., Stelwagen, R., Wunderink, L., Schoevers, R. A., Wichers, M., & Oldehinkel, A. J. (2018). Self-monitoring and personalized feedback based on the experiencing sampling method as a tool to boost depression treatment: A protocol of a pragmatic randomized controlled trial (ZELF-i). *BMC Psychiatry*, *18*(1), 1–11. https://doi.org/10.1186/s12888-018-1847-z

Bates, D., Meachler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Battaglini, A. M., Rnic, K., Tracy, A., Jopling, E., & LeMoult, J. (2021). Co-rumination across in-person and digital communication: Associations with affect and relationship closeness in adolescents. *Journal of Adolescence*, *89*(1), 161–169. https://doi.org/10.1016/j.adolescence.2021.04.011

Bolger, N. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. The Guilford Press.

Buur, C., Zachariae, R., Komischke-Konnerup, K. B., Marello, M. M., Schierff, L. H., & O'Connor, M. (2024). Risk factors for prolonged grief symptoms: A systematic review and meta-analysis. *Clinical Psychology Review*, *107*, 102375. https://doi.org/10.1016/j.cpr.2023.102375

Cherblanc, J., Côté, I., Boever, C., & Zech, E. (2024). Validity of the TGI-SR+ in Francophone populations: Insights from Quebec and Belgium. *Death Studies*, 1–11. https://doi.org/10.1080/07481187.2024.2420882

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Conner, T. S., & Lehman, B. J. (2012). Getting started: Launching a study in daily life. In M. R. Mehl, & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 89–107). The Guilford Press.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology*, *62*(1), 583–619. https://doi.org/10.1146/annurev.psych.093008.100356

Doering, B. K., Barke, A., Vogel, A., Comtesse, H., & Rosner, R. (2022). Predictors of prolonged grief disorder in a German representative population sample: Unexpectedness of bereavement contributes to grief severity and prolonged grief disorder. *Frontiers in Psychiatry*, *13*, 853698. https://doi.org/10.3389/fpsyt.2022.853698

Eisma, M. C., Janshen, A., & Lenferink, L. I. M. (2022). Content overlap analyses of ICD-11 and DSM-5 prolonged grief disorder and prior criteria-sets. *European Journal of Psychotraumatology*, *13*(1), 2011691. https://doi.org/10.1080/20008198.2021.2011691

Elmer, T., Ram, N., Gloster, A. T., & Bringmann, L. F. (2023). Studying daily social interaction quantity and quality in relation to depression change: A multi-phase experience sampling study. *Personality and Social Psychology Bulletin*, *51*(7), 1294–1309.

Ergun, T. D., ten Klooster, P. M., Bohlmeijer, E., Westerhof, G. J., Franzen, M., & Lenferink, L. I. M. (2025). Assessing prolonged grief symptoms using experience sampling methodology: The development of the prolonged grief symptoms - short ecological assessment (PGS-SEA) scale. *Comprehensive Psychiatry*, *140*, 152597. https://doi.org/10.1016/j.comppsych.2025.152597

Franzen, M., & Lenferink, L. I. M. (2024). Investigating reactivity effects of self-monitoring prolonged grief reactions in daily life: A randomized waitlist-controlled trial using experience sampling methodology. ResearchGate (preprint).

Hamaker, E. L., Nesselroade, J. R., & Molenaar, P. C. (2007). The integrated trait–state model. *Journal of Research in Personality*, *41*(2), 295–315. https://doi.org/10.1016/j.jrp.2006.04.003

Heeke, C., Franzen, M., Knaevelsrud, C., & Lenferink, L. I. (2023). Latent classes of prolonged grief and other indicators of mental health in bereaved adults: A systematic review. *Journal of Affective Disorders Reports*, *14*, 100654.

Heeke, C., Kampisiou, C., Niemeyer, H., & Knaevelsrud, C. (2019). A systematic review and meta-analysis of correlates of prolonged grief disorder in adults exposed to violent loss. *European Journal of Psychotraumatology*, *10*(1), 1583524. https://doi.org/10.1080/20008198.2019.1583524

Houben, M., Kalokerinos, E. K., Koval, P., Erbas, Y., Mitchell, J., Pe, M., & Kuppens, P. (2024). The association between the selection and effectiveness of emotion-regulation strategies and psychopathological features: A daily life study. *Clinical Psychological Science*, *12*(5), 973–983. https://doi.org/10.1177/21677026231203662

Howe, E. S., & Dworkin, E. R. (2024). The day-to-day relationship between posttraumatic stress symptoms and social support after sexual assault. *European Journal of Psychotraumatology*, *15*(1), 2311478. https://doi.org/10.1080/20008066.2024.2311478

Johnson, J. G., Cohen, P., Dohrenwend, B. P., Link, B. G., & Brook, J. S. (1999). A longitudinal investigation of social causation and social selection processes involved in the association between socioeconomic status and psychiatric disorders. *Journal of Abnormal Psychology*, *108*(3), 490–499. https://doi.org/10.1037/0021-843X.108.3.490

King, D. W., Taft, C., King, L. A., Hammond, C., & Stone, E. R. (2006). Directionality of the association between social support and posttraumatic stress disorder: A longitudinal investigation. *Journal of Applied Social Psychology*, *36*(12), 2980–2992. https://doi.org/10.1111/j.0021-9029.2006.00138.x

Kirkbride, J. B., Anglin, D. M., Colman, I., Dykxhoorn, J., Jones, P. B., Patalay, P., Pitman, A., Soneson, E., Steare, T., Wright, T., & Griffiths, S. L. (2024). The social determinants of mental health and disorder: Evidence, prevention and recommendations. *World Psychiatry*, *23*(1), 58–90. https://doi.org/10.1002/wps.21160

Kokou-Kpolou, C. K., Lenferink, L. I., Brunnet, A. E., Park, S., Megalakaki, O., Boelen, P., & Cénat, J. M. (2022). The ICD-11 and DSM-5-TR prolonged grief criteria: Validation of the traumatic grief inventory-self report plus using exploratory factor analysis and item response theory. *Clinical Psychology & Psychotherapy*, *29*(6), 1950–1962. https://doi.org/10.1002/cpp.2765

Komischke-Konnerup, K. B., Zachariae, R., Johannsen, M., Nielsen, L. D., & O'Connor, M. (2021). Co-occurrence of prolonged grief symptoms and symptoms of depression, anxiety, and posttraumatic stress in bereaved adults: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, *4*, 100140. https://doi.org/10.1016/j.jadr.2021.100140

Kraiss, J. T., Kohlhoff, M., & Ten Klooster, P. M. (2023). Disentangling between- and within-person associations of psychological distress and mental well-being: An experience sampling study examining the dual continua

model of mental health among university students. *Current Psychology*, *42*(20), 16789–16800. https://doi.org/10.1007/s12144-022-02942-1

Kramer, I., Simons, C. J. P., Hartmann, J. A., Menne-Lothmann, C., Viechtbauer, W., Peeters, F., Schruers, K., Van Bemmel, A. L., Myin-Germeys, I., Delespaul, P., Van Os, J., & Wichers, M. (2014). A therapeutic application of the experience sampling method in the treatment of depression: A randomized controlled trial. *World Psychiatry*, *13*(1), 68–77. https://doi.org/10.1002/wps.20090

Lenferink, L. I. M., Eisma, M. C., Smid, G. E., de Keijser, J., & Boelen, P. A. (2022). Valid measurement of DSM-5 persistent complex bereavement disorder and DSM-5-TR and ICD-11 prolonged grief disorder: The Traumatic Grief Inventory-Self Report Plus (TGI-SR+). *Comprehensive Psychiatry*, *112*, 152281. https://doi.org/10.1016/j.comppsych.2021.152281

Lenferink, L. I. M., Johnsen, I., Kristensen, P., Lie, N. E. K., & Sveen, J. (2024). The Norwegian traumatic grief inventory-self report plus (TGI-SR+): a psychometric evaluation in traumatically bereaved people. *European Journal of Psychotraumatology*, *15*(1), 2391248. https://doi.org/10.1080/20008066.2024.2391248

Lenferink, L. I. M., Terback, E., van Eersel, J. H. W., Zuidersma, M., Franzen, M., & Riese, H. (2024). Fluctuations of prolonged grief disorder reactions in the daily life of bereaved people: An experience sampling study. *Current Psychology*, *43*, 35821–35832. https://doi.org/10.1007/s12144-024-06987-2

Lenferink, L. I. M., van Dijk, I., Eisma, M. C., Eklund, R., Boelen, P. A., & Sveen, J. (2024). Psychometric evaluation of the Swedish Traumatic Grief Inventory Self-Report Plus (TGI-SR+) in bereaved parents. *Clinical Psychology & Psychotherapy*, *31*(1), e2922. https://doi.org/10.1002/cpp.2922

Lenferink, L. I. M., van Eersel, J. H. W., & Franzen, M. (2022). Is it acceptable and feasible to measure prolonged grief disorder symptoms in daily life using experience sampling methodology? *Comprehensive Psychiatry*, *119*, 100140. https://doi.org/10.1016/j.jadr.2021.100140

Lenferink, L. I. M., Wessel, I., de Keijser, J., & Boelen, P. A. (2016). Cognitive behavioural therapy for psychopathology in relatives of missing persons: Study protocol for a pilot randomised controlled trial. *Pilot and Feasibility Studies*, *2*(1), 19. https://doi.org/10.1186/s40814-016-0055-1

Liu, H., Xie, Q. W., & Lou, V. W. (2019). Everyday social interactions and intra-individual variability in affect: A systematic review and meta-analysis of ecological momentary assessment studies. *Motivation and Emotion*, *43*(2), 339–353. https://doi.org/10.1007/s11031-018-9735-x

Maciejewski, P. K., Falzarano, F. B., She, W. J., Lichtenthal, W. G., & Prigerson, H. G. (2022). A micro-sociological theory of adjustment to loss. *Current Opinion in Psychology*, *43*, 96–101. https://doi.org/10.1016/j.copsyc.2021.06.016

Mintz, E. H., Toner, E. R., Skolnik, A. M., Pan, A., Frumkin, M. R., Baker, A. W., Simon, N. M., & Robinaugh, D. J. (2024). Ecological momentary assessment in prolonged grief research: Feasibility, acceptability, and measurement reactivity. *Death Studies*, 1–13. Advance online publication. https://doi.org/10.1080/07481187.2024.2433109

Myin-Germeys, I., Kasanova, Z., Vaessen, T., Vachon, H., Kirtley, O., Viechtbauer, W., & Reinighaus, U. (2018). Experience sampling methodology in mental health research: New insights and technical developments. *World Psychiatry*, *17*(2), 123–132. https://doi.org/10.1002/wps.20513

Nielsen, M. K., Carlsen, A. H., Neergaard, M. A., Bidstrup, P. E., & Guldin, M.-B. (2019). Looking beyond the mean in grief trajectories: A prospective, population-based cohort study. *Social Science & Medicine*, *232*, 460–469. https://doi.org/10.1016/j.socscimed.2018.10.007

Pinheiro, J., Bates, D. & R Core Team. (2022). *nlme: Linear and nonlinear mixed effects models*. https://CRAN.R-project.org/package=nlme

Platt, J., Keyes, K. M., & Koenen, K. C. (2014). Size of the social network versus quality of social support: Which is more protective against PTSD? *Social Psychiatry and Psychiatric Epidemiology*, *49*(8), 1279–1286. https://doi.org/10.1007/s00127-013-0798-4

Pociūnaitė-Ott, J., Kraiss, J., van Eersel, J. H. W., Franzen, M., & Lenferink, L. I. M. (2024). Associations between contextual factors and prolonged grief reactions in daily life: An experience sampling study. Preprint at https://www.researchgate.net/publication/380232862_Associations_between_contextual_factors_and_prolonged_grief_reactions_in_daily_life_An_experience_sampling_study

R Core Team. (2022). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/.

Reitsma, L., Boelen, P. A., de Keijser, J., & Lenferink, L. I. M. (2021). Online treatment of persistent complex bereavement disorder, posttraumatic stress disorder, and depression symptoms in people who lost loved ones during the COVID-19 pandemic: Study protocol for a randomized controlled trial and a controlled trial. *European Journal of Psychotraumatology*, *12*(1), 1987687. https://doi.org/10.1080/20008198.2021.1987687

Rosner, R., Comtesse, H., Vogel, A., & Doering, B. K. (2021). Prevalence of prolonged grief disorder. *Journal of Affective Disorders*, *287*, 301–307. https://doi.org/10.1016/j.jad.2021.03.058

Rosner, R., Pfoh, G., & Kotoučová, M. (2011). Treatment of complicated grief. *European Journal of Psychotraumatology*, *2*(1). https://doi.org/10.3402/ejpt.v2i0.7995

Schaal, S., Koenig, H. G., & Heeke, C. (2021). Co-occurrence of prolonged grief symptoms and symptoms of depression, anxiety, and posttraumatic stress in bereaved adults: A systematic review and meta-analysis. *Journal of Affective Disorders*, *287*, 89–100. https://doi.org/10.1016/j.jad.2021.03.028

Schenker, M. T., Theoswin, P. M., Qian, H., Jordan, A. S., Nicholas, C. L., & Felmingham, K. L. (2023). Sleep and day-to-day PTSD symptom variability: An ecological momentary assessment and actigraphy monitored study in trauma-exposed young adults. *European Journal of Psychotraumatology*, *14*(2), 2202058. https://doi.org/10.1080/20008066.2023.2202058

Schoevers, R. A., van Borkulo, C. D., Lamers, F., Servaas, M. N., Bastiaansen, J. A., Beekman, A. T. F., van Hemert, A. M., Smit, J. H., Penninx, B. W. J. H., & Riese, H. (2021). Affect fluctuations examined with ecological momentary assessment in patients with current or remitted depression and anxiety disorders. *Psychological Medicine*, *51*(11), 1906–1915. https://doi.org/10.1017/S0033291720000689

Schueller, S. M., Aguilera, A., & Mohr, D. C. (2017). Ecological momentary interventions for depression and anxiety. *Depression and Anxiety*, *34*(6), 540–545. https://doi.org/10.1002/da.22649

Scott, H. R., Pitman, A., Kozhuharova, P., & Lloyd-Evans, B. (2020). A systematic review of studies describing the influence of informal social support on psychological wellbeing in people bereaved by sudden or violent causes of death. *BMC Psychiatry*, *20*(1), 1–20. https://doi.org/10.1186/s12888-020-02639-4

Shear, K., Frank, E., Houck, P. R., & Reynolds, C. F. (2005). Treatment of complicated grief: A randomized controlled trial. *JAMA*, *293*(21), 2601–2608. https://doi.org/10.1001/jama.293.21.2601

Shear, M. K., Reynolds, C. F., III, Simon, N. M., Zisook, S., Wang, Y., Mauro, C., Duan, N., Lebowitz, B., & Skritskaya, N. (2016). Optimizing treatment of complicated grief: A randomized clinical trial. *JAMA Psychiatry*, *73*(7), 685–694. https://doi.org/10.1001/jamapsychiatry.2016.0892

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, *4*(1), 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press, Inc.

Smith, K. V., Wild, J., & Ehlers, A. (2020). The masking of mourning: Social disconnection after bereavement and its role in psychological distress. *Clinical Psychological Science*, *8*(3), 464–476. https://doi.org/10.1177/2167702620902748

Stadel, M., Bringmann, L. F., Stulp, G., Elmer, T., Verdonck, S., Mestdagh, M., & van Duijn, M. A. (2024). Capturing the social life of a person by integrating experience-sampling methodology and personal-social-network assessments. *Advances in Methods and Practices in Psychological Science*, *7*(2), 1–19. https://doi.org/10.1177/25152459241244745

Treml, J., Brähler, E., & Kersting, A. (2022). Prevalence, factor structure and correlates of DSM-5-TR criteria for prolonged grief disorder. *Frontiers in Psychiatry*, *13*, 880380. https://doi.org/10.3389/fpsyt.2022.880380

Vachon, H., Viechtbauer, W., Rintala, A., & Myin-Germeys, I. (2019). Compliance and retention with the experience sampling method over the continuum of severe mental disorders: Meta-analysis and recommendations. *Journal of Medical Internet Research*, *21*(12), e14475. https://doi.org/10.2196/14475

van de Pol, M., & Wright, J. (2009). A simple method for distinguishing within-versus between-subject effects using mixed models. *Animal Behaviour*, *77*(3), 753–758. https://doi.org/10.1016/j.anbehav.2008.11.006

van Denderen, M., de Keijser, J., Stewart, R., & Boelen, P. A. (2018). Treating complicated grief and posttraumatic stress in homicidally bereaved individuals: A randomized controlled trial. *Clinical Psychology & Psychotherapy*, *25*(4), 497–508. https://doi.org/10.1002/cpp.2183. Advance online publication.

Wang, Y., Chung, M. C., Wang, N., Yu, X., & Kenardy, J. (2021). Social support and posttraumatic stress disorder: A meta-analysis of longitudinal studies. *Clinical Psychology Review*, *85*, 101998. https://doi.org/10.1016/j.cpr.2021.101998

WHO. (2018). ICD-11. Prolonged Grief Disorder (2018). Retrieved April 14, 2021, from https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1183832314

Wickramaratne, P. J., Yangchen, T., Lepow, L., Patra, B. G., Glicksburg, B., Talati, A., Adekkanattu, P., Ryu, E., Biernacka, J. M., Charney, A., Mann, J. J., Pathak, J., Olfson, M., & Weissman, M. M. (2022). Social connectedness as a determinant of mental health: A scoping review. *PLoS One*, *17*(10), e0275004. https://doi.org/10.1371/journal.pone.0275004

Wild, J., Duffy, M., & Ehlers, A. (2023). Moving forward with the loss of a loved one: Treating PTSD following traumatic bereavement with cognitive therapy. *The Cognitive Behaviour Therapist*, *16*(e12), 1–28. https://doi.org/10.1017/S1754470X23000041