Between and Within-Person Associations of Social Contact and Prolonged Grief Symptoms in Individuals with Acute Prolonged Grief Disorder: An Experience Sampling Method Study

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Abstract

Background Since the publication of the DSM-5-TR, individuals suffering from pathological grief can be diagnosed with prolonged grief disorder (PGD). Research underlines the importance of early detection of PGD. The quality of social contact in the daily lives of recently bereaved people may play a key role in protecting people from developing PGD. However, past research lacks consistent evidence and is characterised by methodological shortcomings. Thus, this study aims to investigate the relationship between the quality of social contact and PGD symptoms of individuals with acute PGD using the Experience Sampling Method (ESM).

Method People who met the criteria for PGD three to six months after the death of their loved one (N=76, M_{age} = 52.21, 88.2% female) received smartphone-based questionnaires five times a day for two weeks including questions about PGD intensity and their social contact. To test both between and within-person effects, linear regression and linear mixed models were applied to analyse the relationship between the quality of social contact and PGD symptoms.

Results Based on N=5320 observations, compared to being alone, pleasant and less pleasant contact were significantly associated with lower PGD symptoms at the within-person level, but not at the between-person level.

Conclusion This study investigated to what extent the quality of social contact is associated with PGD symptoms in individuals with acute PGD, considering both between-person and within-person levels. Results showed that compared to being alone, both pleasant and less pleasant contact were linked to lower PGD symptoms, despite small effect sizes. The findings highlight the importance of accounting for individual variability in PGD symptoms and suggest further research into regulating PGD in daily life and targeted interventions.

Keywords: Prolonged Grief; Prolonged Grief Disorder; Social Support; Social Contact; Experience Sampling Method; Ecological Momentary Assessment; Intensive Longitudinal Data.

Between and Within-Person Associations of Social Contact and Prolonged Grief Symptoms in Individuals with Acute Prolonged Grief Disorder: An Experience Sampling Method Study

Recently, PGD has been added to the *Diagnostic and Statistical Manual of Mental Disorders* 5, Text Revision (DSM-5-TR). It describes a grief experience that differentiates from a normal reaction (Stroebe, 2010), affecting cognitive, behavioural, and emotional functioning (American Psychiatric Association, 2022; Stroebe, 2010). According to DSM-5-TR, criteria for PGD include yearning, preoccupation, feeling that a part of self died, perceiving the loss as unreal, avoidance, intense emotional pain (sadness, anger), difficulty moving on, numbness, meaningless of life and loneliness (American Psychiatric Association, 2022; Lenferink et al., 2022). An occurrence between 9.8% and 13% among bereaved adults (Comtesse et al., 2024; Lundorff et al., 2017) makes PGD a highly prevalent disorder, thereby it is crucial to investigate protective factors closely to treat PGD adequately.

Early detection of PGD remains a critical focus in research and clinical practice, as interventions initiated soon after the onset of symptoms may prevent the development of severe PGD (Boelen & Lenferink, 2019; Pociunaite et al., 2023). A latent trajectory study meaningfully demonstrated that individuals with high PGD levels were prone to displaying the symptoms five years post-loss without treatment (Pociunaite et al., 2023). Early interventions can help prevent long-term adversity after grief. Litz et al. (2014) found that treatment for recently bereaved individuals significantly reduced later grief symptoms. Similarly, an RCT by Reitsma et al. (2023) showed that recently bereaved individuals displayed lower symptoms of complicated grief, PTSD, and depression post-intervention compared to waitlist controls. Thus, it becomes evident that early detection and treatment of PGD is feasible and crucial in preventing long-term complaints. However, it is also vital to understand the contextual factors that protect from the exacerbation of PGD symptoms.

Particularly, social contact warrants further investigation as a protective factor of prolonged grief in daily life. Several studies have emphasised the importance of social contact in mental health, showing that negative social contact or the absence of social contact were found to be related to more depressive symptoms in non-bereaved samples compared to positive social interactions (Pemberton & Tyszkiewicz, 2016; Snippe et al., 2016; Achterhof et al., 2022). In prolonged grief specifically, individuals often experience a sense of social disconnection, characterised by feelings of isolation and withdrawal from others (Breen & O'Connor, 2008). Supportive social interactions may help reduce the emotional burden of grief, while the absence of such support can exacerbate feelings of loneliness and despair (Vachon & Stylianos, 1993). Despite its recognised importance in literature, the protective role of social contact compared to no contact in PGD remains unclear.

This is reflected in previous research about social contact and grief yielding mixed results. In their extensive literature review, Stroebe et al. (2005) concluded from cross-sectional and longitudinal studies that there is no consistent evidence of a relationship between social support and grief-specific symptoms. Contrarily, more recent studies underscore the importance of social support in mitigating PGD symptoms (Logan et al., 2017; Pociunaite et al., 2024; Scott et al., 2020). These conflicting findings suggest that the protective effects of social contact on PGD are not yet fully understood and may be the result of various methodological limitations.

A closer examination of the literature reveals several key methodological shortcomings in previous research on PGD and social contact. Firstly, much of the earlier work, including that reviewed by Stroebe et al. (2005) used instruments measuring depression to conclude grief-specific symptoms. However, since the addition of PGD in the DSM-5-TR, PGD is viewed as a distinct condition reflected in recent work. For instance, PGD appears to predict higher depression symptoms, but depression symptoms do not predict grief symptoms (Eisma & Buyukcan-Tetik, 2024). Concluding, previous research lacks construct validity, as PGD and depression, despite being related are separate constructs. Additionally, before the development

of reliable and valid measurement instruments for PGD, such as the TGI-CA (Lenferink et al., 2023), identifying populations suffering from PGD was done using outdated measures (Lenferink et al., 2023; Stroebe et al., 2005). This calls into question whether the investigated samples from past research suffer from PGD or whether they displayed regular grief reactions. In conclusion, much past research lacks adequate sampling and measurement methods, highlighting the need for investigating clinically relevant populations using appropriate and validated instruments.

Adding to methodological concerns, PGD was also found to be a dynamic construct as it fluctuates in everyday life (Lenferink et al., 2022), calling into question the utilisation of the cross-sectional designs predominantly used in PGD research (Lenferink et al., 2023; Wanza et al., 2023). This dynamic nature becomes a concern as recalling emotions as memories is prone to biases due to affective states and current underlying coping mechanisms (Field et al., 2006; Levine & Safer, 2002). Accordingly, in cross-sectional research, participants' current grief states possibly influence the memory of past grief, resulting in individuals with greater decreases in grief reporting less severe past grief. To overcome this limitation, the Experience Sampling Method (ESM) proves advantageous, as it is an intensive longitudinal data collection method recording activities and psychological states in people's everyday lives (e.g., Kuranova et al., 2020; Shallcross et al., 2010; Tschacher & Lienhard, 2021). It enables the drawing of possible links between contexts (e.g., social contact in daily life) and the emotional processes (e.g., PGD symptoms at different moments) occurring within individuals (Hektner et al., 2007). Subsequently, the collected data proves ecologically valid (Hiekkaranta et al., 2021) offering the natural benefit of avoiding recall bias, a disadvantage in cross-sectional study designs (Napa Scollon et al., 2009).

Another advantage of ESM concerns the disaggregation of between- and within-person effects, allowing to draw level-specific conclusions (Curran & Bauer, 2011; Kraiss et al., 2022; Yaremych et al., 2023). For instance, on a between-person level, it could demonstrate whether

people with more pleasant social contact than others show less severe PGD symptoms than others. On a within-person level, it can be investigated whether an individual reporting more pleasant social contact than usual displays less PGD symptoms in the same moment. Intensive longitudinal data, such as collected by ESM, furthermore, allows to separate these effects and preventing them from blending into each other by applying multilevel modelling (Curran & Bauer, 2011; Kraiss et al., 2022) Thus, using ESM to investigate the relationship between PGD and social contact allows to capture their dynamic components and draw conclusions on between- and within-person effects.

Although some ESM research has explored the effects of social contact on PGD symptoms, important limitations remain. For instance, a recent ESM study by Pociunaite et al., (2024), showed that pleasant social contact compared to being alone yields protective effects on PGD symptoms. However, most of the sample was non-clinically bereaved, raising concerns about the generalisability of these findings to clinically relevant populations suffering from acute PGD. Studying such populations can provide valuable insights, for instance, to foster normative treatment options promoting social engagement and reintegration on a behavioural level (Jordan & Litz, 2014). Additionally, addressing the methodological limitations (i.e., construct validity), can clarify the inconsistent body of research on PGD. Thus, the current paper aims to study the relationship between the quality of social contact and PGD symptoms in the daily lives of clinically bereaved individuals suffering from acute PGD using ESM. The following research questions (RQs) will be answered:

RQ1: Is the quality of social contact compared to being alone associated with PGD symptoms across individuals?

RQ2: Is the quality of social contact compared to being alone associated with PGD symptoms within and between individuals?

H1: Compared to being alone, pleasant social contact is associated with lower PGD symptoms between persons.

H2: Compared to being alone, less pleasant social contact is associated with higher PGD symptoms between persons.

H3: Compared to being alone, pleasant social contact is associated with lower PGD symptoms in the moment, both between and within persons.

H4: Compared to being alone, less pleasant social contact is associated with higher PGD symptoms in the moment, both between and within persons.

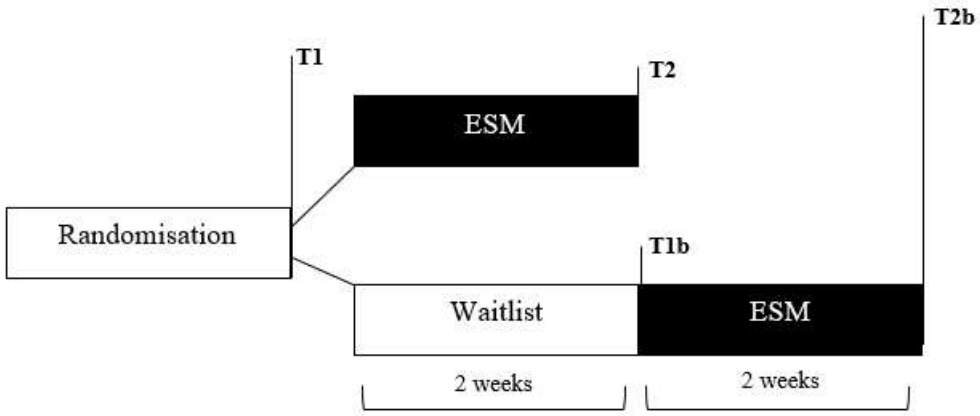
Methods

Design

The study was designed as a randomised controlled trial (RCT). After recruitment, subjects were randomly assigned to the ESM or waitlist conditions through blocking randomisation (random.org). Overall, four interviews were conducted, namely T1, T2, T1b, and T2b (see Figure 1). After randomisation, the first telephone interviews with both conditions were conducted at T1. Subsequently, the ESM condition started with the 14-day ESM phase while the waitlist condition had to wait for two weeks. Another round of telephone interviews was conducted after this period at T2 (ESM) and T1b (Waitlist). Afterwards, the waitlist condition entered the 14-day ESM phase. Lastly, another round of interviews was conducted at T2b (Waitlist). This study was approved by the BMS Ethics Committee of the University of Twente (ID: 221328).

Figure 1

Design of the study



Note. T = Telephone Interview

Participants

Individuals were recruited from February 2023 until July 2023 from a Dutch grief website (rouwbehandeling.nl) offering grief information for bereaved individuals. Interested people could complete a screening tool online for assessing acute PGD severity, called the Traumatic Grief Inventory-Self Report Plus (TGI-SR+), to test whether professional bereavement care might be indicated. After completing the TGI-SR+, people were asked whether they consent to participate in future research about grief (Lenferink et al., 2023). If agreed, they were contacted by a student from either the University of Twente or the Erasmus University Rotterdam via E-Mail.

To be eligible for the study, participants had to meet all the inclusion and none of the exclusion criteria. Participants had to be older than 18 years, have lost a loved one 3 to 6 months before participation, be fluent in Dutch or German, and own a smartphone. Further, they had to meet the diagnostic criteria for probable DSM-5-TR acute PGD under a scoring algorithm. The TGI-CA was used to assess probable PGD in a telephone interview (T1). The affectedness by each symptom during the last month was reported on a 5-point Likert scale from 1 ("*never*") to 5 ("*always*"). As in former works (Heeke et al., 2023), a symptom was classified as endorsed if rated with "*sometimes*", "*frequently*", or "*always*". To meet the DSM-5-TR PGD, at least one among the two Criterion B (i.e., separation distress) items (items 1 and 3), three of the eight

Criterion C (cognitive, emotional, and behavioural) symptoms, and the Criterion D should be endorsed. All Criterion C symptoms are elicited by one of the TGI-CA items (items 6, 9, 10, 11, 18, 19, and 21), except one symptom (C4 criterion "intense emotional pain"), which is elicited by two TGI-CA items (items 2 and 8). The highest score on one of these two items is hence used to represent the C4 criterion.

Participants were excluded if they were suicidal or had a diagnosis of a psychotic disorder. Suicidal intentions were tested at all telephone interviews (T1, T1b, T2, T2b). A safety protocol was prompted if the participant scored higher than 1 ("*Not at all*") to ensure that part-taking in the study was still safe, asking further questions about suicidality. Suicidal participants were excluded from the research and given information about how to seek help. Psychotic disorder was also screened at T1, asking, "Have you ever received a diagnosis for a psychotic disorder from a psychologist, therapist or psychiatrist?".

Procedure

Participants who met the inclusion criteria received a standardised invitation email to join the study. Within this email, a link directed them to Qualtrics, where they found a letter containing an informed consent form. Upon agreement, individuals were designated as participants to participate and provided with an ID number. Subsequently, were randomly assigned to either the ESM or the waitlist condition. Additionally, they were contacted via phone to schedule the first interview (T1). A reminder email was sent to those who did not complete the informed consent within one week. Participants who had scheduled T1 were sent a reminder email one to two days in advance prior to their telephone interview. The interviews were conducted by clinical psychology master students who had undergone training for the interviews, receiving guidance from supervisors and engaging in practice sessions.

A follow-up interview was arranged at the end of interview T1 (T2 or T2b). This second interview occurred within one week after the ESM phase or waiting period, with participants reminded one to two days prior. Participants in the waitlist condition were instructed to wait

two weeks until their next interview, while those in the ESM condition commenced self-monitoring immediately via the Ethica app (https://avicennaresearch.com/). After the interview, they received an instructional E-Mail explaining how to install the app. Participants received five notifications daily over a two-week period, prompting them to answer ESM questions regarding their PGD symptoms and social context. Notifications were spaced semi-randomly three hours apart beginning between 8.30 and 9.30 a.m. (i.e., between 11.30 a.m. and 12.30 p.m., 2.30 – 3.30 p.m., 5.30-6.30 p.m. and 8.30-9.30 p.m.). Respondents had one hour to complete the survey and a maximum of two reminders were sent if participants failed to complete the ESM items. Participants in the ESM condition concluded their participation after interview T2, whereas those in the waitlist condition proceeded with the ESM phase. Lastly, their T2b interview ultimately concluded their participation in the study.

Measures

Measures included interview-based assessment (at T1, T2, T1b, T2b) as well as ESM questionnaires. The interview questionnaire included the Traumatic Grief Inventory Clinician Administered (TGI-CA) among other questionnaires. While the TGI-CA was assessed in T1, T1b, T2, and T2b, the background and loss-related characteristics were merely assessed in T1.

Background and Loss-Related Characteristics

In addition to assessing PGD severity, various background and loss-related factors were evaluated at T1. Background characteristics including gender, date of birth, country of birth, and educational level were assessed, alongside loss-related aspects such as duration since the loss occurred, relationship to the deceased, cause of death, anticipation of the loss, and presence of PGD symptoms at baseline (Lenferink et al., 2022). Certain items featured predefined response choices, such as relationship to the deceased (1 = partner, 2 = child etc.), while others were open-ended questions, like nationality.

Interview-Based PGD Severity Assessed at Baseline (TGI-CA)

Interview-based PGD severity was assessed at baseline using the Traumatic Grief Inventory-Clinician Administered (TGI-CA). It is a 22-item questionnaire in interview format measuring pathological grief according to the DSM-5-TR and the ICD-11 (Lenferink et al., 2023). While it was developed to measure general grief reactions, it is presumably a valid and reliable instrument (Lenferink et al., 2023). To measure PGD, the items corresponding to the DSM-5-TR criteria were selected (i.e., 1, 3, 6, 9, 10, 11, 18, 19, 21 and the highest answer option on 2 or 8). The questionnaire's items, such as "In the past month, did you feel alone or detached from others?" were adapted to fit the two-week period between interviews. Items were rated on a 5-point Likert scale from 1 ("*never*") to 5 ("*always*"). Cronbach's alpha for this sample at T1 was .84.

ESM-Items to Assess PGD Severity

The ESM-items assessing PGD severity are based on DSM-5-TR criteria for PGD by Lenferink et al. (2022), adopted from the TGI-SR+ to fit the ESM timeframe. The 11 PGD items, such as "In the past three hours, I found myself yearning for him/her." were rated on a 7-point Likert scale from 0 ("*not at all*") to 6 ("*very much*"). A split-half reliability coefficient of 0.72 was found (see Brown, 1910; Spearman, 1910).

ESM-Items to Assess Social Contact Quality

To assess the quality of social contact, firstly, participants were asked about their social contact with "Were you with other people?" triggering the answer options "*Yes, with one other person*", "*Yes, with multiple others*" or "*No, I was alone*". If they answered "*Yes, with one other person*" or "*Yes, with multiple others*", the quality of the social contact was asked in the next question. If they answered, "*No, I am alone*", no question about the quality of social contact was asked. To measure the quality of social contact, a one-item measure from the ESM item repository was used (Kirtley et al., 2020), asking, "How did you find the contact?". This statement was rated on a semantic differential scale from 0 ("*very unpleasant*") to 6 ("*very pleasant*").

Subsequently, for the analysis the social contact variable ("Were you with other people?") was split into "With others" and "Alone". Out of the social contact and quality of social contact, three categories were created, namely "with others and pleasant contact", "with others and less pleasant contact," and "I was alone". These categorical variables were then dummy coded into "pleasant contact vs. alone" and "less pleasant contact vs. alone", with "I was alone" being the reference category. Pleasant and less pleasant contact were distinguished per person by using each individual's scale rating median of the dummy-coded quality of social contact variables (values ≤ median were considered less pleasant). A split-half reliability coefficient of 0.79 was found (see Brown, 1910; Spearman, 1910).

Data Analysis

The data was analysed using the open-source program R-4.3.1 with the R Studio interface (Posit team, 2024). Participants who completed less than 50% of the ESM questionnaires were filtered out, which is common practice in ESM research (Conner & Lehman, 2012).

An ANCOVA was conducted in previous research based on the same dataset to exclude the possibility of reactivity (i.e., increased self-monitoring) caused by the ESM (Philipp, 2024). The model tested whether the assigned condition (IV) is associated with post-ESM PGD scores (DV), including the baseline PGD scores as a covariate. As no differences were found between the two conditions, both groups' observations were used for the following analyses.

Firstly, the between-person relationships between quality of social contact (IV) and the 11 PGD-symptoms (DV) were tested using linear regression models. Person-mean (PM) scores were calculated using each person's PGD-symptom (ESM) and quality of social contact scores (ESM) throughout the study period. The model included person mean scores of "pleasant contact vs. alone", "less pleasant contact vs. alone", and ESM-PGD symptoms as fixed effects.

Secondly, linear mixed models (LMM) were applied using a random intercept with a maximum likelihood estimation (MLE). Linear mixed models were chosen as they account for

the nested structure of the longitudinal data and missing observations (Myin-Germeys & Kuppens, 2022). They also allow the disaggregation of level 1 (repeated measures) from level 2 (individuals) effects (Enders & Tofighi, 2007; Yaremych et al., 2021). Firstly, empty models were created to determine the intraclass correlations (ICC) for the dependent variables and further determine the model fit of the LMM. The ICC values for ESM-PGD items ranged from 0.489 to 0.765, indicating high correlations of ESM-PGD symptom ratings within persons. A higher deviance value in the empty models indicated that random intercepts contributed to explanatory power; thereby, random intercepts were retained for the model. An ANOVA was conducted to determine whether the REML or MLE model fits the data more adequately. An MLE was retained, as neither model proved superior, and the sample size was appropriate.

Within-cluster centring was applied by subtracting momentary scores of "pleasant contact vs alone" and "less pleasant contact vs alone" from each individual's person-mean of the according variable, resulting in person-mean centred scores (PMCs). Within-cluster centring ensures that level-specific effects are achieved by disaggregating between-person from within-person effects (Enders & Tofighi, 2007; Yaremych et al., 2021). Subsequently, 11 LMMs were conducted to investigate the within-person relationship between the momentary quality of social contact (IV) and momentary PGD symptoms (DV). "Pleasant contact vs. alone", "Less pleasant contact vs. alone" (both PM and PMC scores), state PGD symptoms were included as fixed effects, and the individuals were included as random effects. The nlme package was used to compute the linear mixed models (Pinheiro et al., 2024). Standardised regression coefficients (β) were obtained using the effectsize package (Ben-Shachar et al., 2020). The strength of standardized estimates was interpreted as small (β >.10), medium (β >.30) and large (β >.50) (Cohen, 1988).

Results

Starting with N=184, participants not meeting the criteria for acute PGD were excluded (N=79) leaving 105 participants. After further excluding participants with responses of less than

50%, the final sample consisted of *N*=76 individuals. Regarding the demographic data (see Table 1), the majority of the sample identified as female, had a college degree, and had a nuclear family member who died of a natural cause. Regarding contextual factors (see Table 2), most participants spent time alone or with others and were pleasant.

Table 1

Background and Loss-Related Sample Characteristics (N=76)

Variable	Description	%	*n*
Age	25-85 years (*M*=52.21, *SD*=11.03)	-	76
Gender	Male	11.8%	9
	Female	88.2%	67
Educational Degree	College University	64.5%	49
	Other than college/university	35.5%	27
Cause of Death, N (%)	Natural	75%	57
	Unnatural (i.e., accident, homicide, suicide)	25%	19
Unexpectedness of the loss, M (SD), range	*M*=3.59 (SD=1.45), 1-5		
Deceased relative is my …, N (%)	Partner	55%	42
	Child	8%	6
	Parent	31%	23
	Sibling	2%	2
	Other	4%	3

Time since loss in weeks, M (SD)	22.92 (4.78)
T1 PGD severity, M (SD)	32.51 (5.14)

Table 2

Contextual Characteristics (N= 4364)

Variable	Description	%	*n*
Quality of contact, M (SD), range	*M*=4.27 (SD=1.26), 1-7	-	
Social Environment	Alone	42.05%	1833
	With Others & Pleasant	42.53%	1856
	With Others & Less Pleasant	15.42%	673
Sum of Times Per Participant Spent With Others, *M* (*SD*)	26.42 (11.39)		

Associations between Quality of Social Contact and PGD-Symptoms Between-Persons

The linear regression model output showed non-significant and significant associations of pleasant contact vs. alone (less pleasant contact vs. alone) and ESM-PGD symptom scores at a between-person level (see Table 3). Compared to being alone, pleasant contact was significantly associated with less yearning, preoccupation, part of self died, unrealness, sadness, difficulty moving on, numbness, life is meaningless and loneliness between persons. There was no significant association between anger and avoidance. Compared to being alone, less pleasant contact was significantly associated with less yearning, part of self died, unrealness, and life is meaningless between persons. There were also significant associations of less pleasant contact with more preoccupation, avoidance, anger, and difficulty moving on. No relationship was

found with numbness and loneliness. The majority of the significant effect sizes can be interpreted as very small (β <.10) to small (β >.10) (Cohen, 1988).

Table 3

Standardised Estimates for Univariate Linear Regression Models Examining Between-Person Associations (N=76)

Parameter	β	*SE*	*t*	*p*
			Yearning	
Alone vs. pleasant contact (PM)	-.07	0.01	-5.22	<.001***
Alone vs. less pleasant contact (PM)	-.04	0.01	-3.00	.003**
			Preoccupation	
Alone vs. pleasant contact (PM)	-.09	0.01	-7.10	<.001***
Alone vs. less pleasant contact (PM)	.03	0.01	2.33	.02*
			Part of Self Died	
Alone vs. pleasant contact (PM)	-.10	0.01	-7.87	<.001***
Alone vs. less pleasant contact (PM)	-.25	0.01	-19.1	<.001***
			Unrealness	
Alone vs. pleasant contact (PM)	.05	0.01	3.39	<.001***
Alone vs. less pleasant contact (PM)	-.10	0.01	-7.19	<.001***
			Avoidance	
Alone vs. pleasant contact (PM)	<.01	0.01	-0.25	.81
Alone vs. less pleasant contact (PM)	.07	0.01	5.36	<.001***
			Sadness	
Alone vs. pleasant contact (PM)	-.12	0.01	-8.97	<.001***
Alone vs. less pleasant contact (PM)	-.03	0.01	-1.81	.07

			Anger	
Alone vs. pleasant contact (PM)	-.03	0.01	-1.87	.06
Alone vs. less pleasant contact (PM)	.07	0.01	4.59	<.001***
			Difficulty Moving On	
Alone vs. pleasant contact (PM)	-.06	0.01	-4.85	<.001***
Alone vs. less pleasant contact (PM)	.09	0.01	6.33	<.001***
			Numbness	
Alone vs. pleasant contact (PM)	-.10	0.01	-7.41	<.001***
Alone vs. less pleasant contact (PM)	<.01	0.01	-0.36	.72
			Life is Meaningless	
Alone vs. pleasant contact (PM)	-.20	0.01	-15.2	<.001***
Alone vs. less pleasant contact (PM)	-.20	0.01	-15.43	<.001***
			Loneliness	
Alone vs. pleasant contact (PM)	-.16	0.01	-11.56	<.001***
Alone vs. less pleasant contact (PM)	-.01	0.01	-1.06	.291

Note. PM = person-mean scores; * indicates p < .05, ** indicates p < .01, *** indicates p < .001.

Associations between Quality of Social Contact and PGD Symptoms Between and Within-Persons

The LMMs revealed mostly significant effects between pleasant and less pleasant contact (compared to being alone) and ESM-PGD symptoms at the within-person level and mostly non-significant associations at the between-person level (see Table 4). At the within-person level, compared to being alone, being in pleasant contact was associated with less yearning, preoccupation, avoidance, anger, difficulty moving on, feeling life is meaningless and less loneliness. No significant within-person associations were found between pleasant contact

and part of self died, unrealness, and numbness. Less pleasant contact compared to being alone was significantly associated with less yearning, preoccupation, part of self died, avoidance, sadness, anger, difficulty moving on, numbness, life is meaningless and loneliness within persons. There was no significant association between less pleasant contact and unrealness. At the between-person level, compared to being alone, being in less pleasant contact (PM) was significantly associated with less part of self died. Compared to being alone, being in pleasant contact (PM) is associated with less avoidance between persons. The majority of the significant effect sizes can be interpreted as very small (β <.10) (Cohen, 1988)

Table 4

Estimates for Univariate 2-Level Linear Mixed Models Investigating Between and Within-Person Associations (N=5320)

Parameter	β	*SE*	*t*	*p*
		Yearning		
Alone vs. pleasant contact (PMC)	-.05	0.01	-4.8	<.001***
Alone vs. less pleasant contact (PMC)	-.05	0.01	-4.7	<.001***
Alone vs. pleasant contact (PM)	-.05	0.09	-0.6	.545
Alone vs. less pleasant contact (PM)	-.03	0.09	-0.3	.719
		Preoccupation		
Alone vs. pleasant contact (PMC)	-.03	0.01	-2.88	.004**
Alone vs. less pleasant contact (PMC)	-.03	0.01	-2.65	.008**
Alone vs. pleasant contact (PM)	-.07	0.08	-0.85	.399
Alone vs. less pleasant contact (PM)	.022	0.08	0.28	.779
		Part of Self Died		
Alone vs. pleasant contact (PMC)	-.01	0.008	-1.21	.24
Alone vs. less pleasant contact (PMC)	-.03	0.008	-1.99	.002**
Alone vs. pleasant contact (PM)	-.09	0.098	-0.74	.34
Alone vs. less pleasant contact (PM)	-.22	0.097	-2.42	.02*
		Unrealness		
Alone vs. pleasant contact (PMC)	.004	0.009	0.45	.65

Alone vs. less pleasant contact (PMC)	-.001	0.009	-0.11	.91
Alone vs. pleasant contact (PM)	-.04	0.09	0.40	.69
Alone vs. less pleasant contact (PM)	-.08	0.09	-0.85	.39
		Avoidance		
Alone vs. pleasant contact (PMC)	-.02	0.009	-2.02	.04*
Alone vs. less pleasant contact (PMC)	-.06	0.009	-6.35	<.001***
Alone vs. pleasant contact (PM)	-.002	0.09	-0.03	.03*
Alone vs. less pleasant contact (PM)	.06	0.09	0.64	.95
		Sadness		
Alone vs. pleasant contact (PMC)	-.03	0.01	-3.30	<.001***
Alone vs. less pleasant contact (PMC)	-.04	0.01	-3.92	<.001***
Alone vs. pleasant contact (PM)	-.09	0.08	-1.07	.28
Alone vs. less pleasant contact (PM)	-.02	0.08	-0.22	.81
		Anger		
Alone vs. pleasant contact (PMC)	-.03	0.009	-3.08	.002**
Alone vs. less pleasant contact (PMC)	-.04	0.009	-4.80	<.001***
Alone vs. pleasant contact (PM)	-.02	0.09	-0.23	.81
Alone vs. less pleasant contact (PM)	.05	0.09	0.54	.58
		Difficulty Moving On		
Alone vs. pleasant contact (PMC)	-.05	0.01	-4.78	<.001***
Alone vs. less pleasant contact (PMC)	-.13	0.01	-11.8	<.001***
Alone vs. pleasant contact (PM)	-.04	0.08	-0.57	.57
Alone vs. less pleasant contact (PM)	.06	0.08	0.76	.45
		Numbness		
Alone vs. pleasant contact (PMC)	<.001	0.008	-0.06	.078
Alone vs. less pleasant contact (PMC)	-.05	0.008	-6.03	<.001***
Alone vs. pleasant contact (PM)	-.08	0.01	-0.88	.06
Alone vs. less pleasant contact (PM)	-.004	0.01	-0.04	.18
		Life is Meaningless		
Alone vs. pleasant contact (PMC)	-.03	0.008	-3.81	<.001***
Alone vs. less pleasant contact (PMC)	-.06	0.008	-8.08	<.001***
Alone vs. pleasant contact (PM)	-.17	0.09	-1.82	.073
Alone vs. less pleasant contact (PM)	-.18	0.09	-1.85	.069
		Loneliness		

Alone vs. pleasant contact (PMC)	-.04	0.01	-3.92	<.001***
Alone vs. less pleasant contact (PMC)	-.12	0.01	-10.2	<.001***
Alone vs. pleasant contact (PM)	-.12	0.08	-1.38	.16
Alone vs. less pleasant contact (PM)	-.01	0.08	-0.12	.91

Note. PMC = person-mean-centred scores; PM = person-mean scores; * indicates p < .05, ** indicates p < .01, *** indicates p < .001.

Discussion

The present study investigated the relationship between the quality of social contact and PGD symptoms in daily life using 5320 observations collected with ESM. This paper aimed to extend previous research, primarily based on cross-sectional study designs, by studying between and within-person associations in a clinical sample with acute PGD using an intensive longitudinal study design.

The findings of the first models investigating only between-person associations showed that compared to being alone most PGD symptoms are significantly associated with both pleasant and less pleasant social contact across individuals. Regarding our first hypothesis, compared to being alone, pleasant contact was significantly associated with all PGD symptoms except anger and avoidance on a between-person level. Looking at the second hypothesis, being in less pleasant contact, seems to be related to both less (e.g., yearning) and more (e.g., anger) PGD symptoms across the sample.

Interestingly, in the second model, the between-person effects largely disappear while most within-person effects between quality of social contact and PGD symptoms prove significant when disaggregating between and within-person effects. On a within-person level compared to being alone, being in pleasant contact was associated with less yearning, preoccupation, avoidance, anger, difficulty moving on, feeling life is meaningless and less loneliness. No significant associations were found between pleasant contact and part of self died, unrealness, and numbness. Thus, compared to being alone, being in more pleasant contact

than usual for that specific individual means reporting less prolonged grief symptoms in the moment. On the other hand, compared to being alone, less pleasant contact was significantly associated with less yearning, preoccupation, part of self died, sadness, anger, numbness, life is meaningless, and loneliness within persons. However, no significant relationship was found with unrealness. This means that compared to being alone, when being in less pleasant contact than usual for this specific person, that person also reports less prolonged grief reactions. At the between-person level, almost no significant associations between being alone compared to pleasant and less pleasant and PGD symptoms were found.

These findings are partly in line with expectations and add evidence to the mixed literature on the relationship between the quality of social contact and the symptoms of PGD. It was anticipated that compared to being alone, pleasant social contact would be associated with lower PGD symptoms and that less pleasant contact would be linked to higher symptoms. However, our results indicate that compared to being alone, individuals with acute PGD display lower PGD symptoms when in both pleasant and less pleasant social contact. While earlier research is characterised by methodological shortcomings (see Stroebe et al., 2005), the effects of pleasant social contact on PGD from this paper align with more recent research about the benefits of social contact in grief and PGD specifically (Logan et al., 2017; Pociunaite, 2024; Scott et al., 2020). Contradictory to expectations, compared to being alone, less pleasant contact appears to be associated with lower PGD symptoms which is not in line with previous research underlining the detrimental effects of negative social contact in grief (Breen & O'Connor, 2008; Pemberton & Tyszkiewicz, 2016; Wilsey & Shear, 2007). This expands on previous work by Pociunaite (2024), which found that only pleasant social contact was linked to lower PGD symptoms in non-clinically bereaved samples, while we also found a positive effect of less pleasant contact compared to being alone.

It is possible that both pleasant and less pleasant social contact may serve as a distraction from grief, allowing individuals to detach, at least temporarily, from their grief experience

(Smith et al., 2020; Van Hout et al., 2020). Regarding less pleasant contact specifically, it is possible that, given the relatively recent bereavement of the sample, some participants rated their social contact as less pleasant as it possibly felt strenuous. Nevertheless, these interactions may still have been helpful in the grieving process, explaining the association with lower PGD symptoms. Furthermore, as individuals with PGD tend to feel socially disconnected from their environments (Breen & O'Connor, 2008), isolation and loneliness could be more stressful and undesirable than less pleasant social contact (e.g., Pemberton & Tyszkiewicz, 2016; Snippe et al., 2016). Thus, any form of social contact whether pleasant or less pleasant may foster feelings of social connectedness and thereby reduce PGD symptoms.

These findings highlight the importance of disaggregating within from between-person effects in PGD symptoms and quality of social contact as illustrated in previous research (Curran & Bauer, 2012; Kraiss et al., 2022, Yaremych et al., 2023). In this study, between-person effects disappeared when modeled alongside within-person effects. This underlines the role of person-mean centering which captures how an individual's PGD or quality of social contact score deviates from their own average. These within-person fluctuations appear to play a crucial role in the understanding of PGD symptoms compared to stable, between-person differences. Thus, when observed separately, the significant between-person effects may have inflated the relationship, likely representing underlying within-person variability.

Implications & Future Research

Our findings underline the importance of using ecologically valid methodologies in research such as Experience Sampling Method (ESM). Contrary to cross-sectional research, ESM allows to capture the within-person variability over time, providing a more detailed understanding of how PGD symptoms and social contact fluctuate in real-world contexts. This approach addresses the limitations of past grief research, which often failed to account for these dynamic processes such as the experience of "waves of grief" (Stroebe & Schut, 1999). In the future, it could also prove valuable to extend the use of ESM over a more prolonged period, as

prolonged grief is diagnosed only when symptoms persist for at least 12 months (American Psychological Association, 2022). Thus, exploring long-term PGD symptoms and social contact through analyses such as latent growth modelling could offer deeper insights into the role of more consistent types of social contact (i.e., social support systems) in the development of PGD.

Within the scope of this research, studying a clinically relevant sample with acute PGD enhanced the generalizability of the findings, providing valuable implications for clinical practice. This is highlighted by a similar study conducted by Pociunaite et al. (2024), which examined a non-clinical bereaved sample and found no significant associations between less pleasant social contact and PGD symptoms compared to being alone which our study managed to produce. Since PGD was newly introduced as a diagnostic category in the recent publication of the DSM-5-TR, effective intervention and treatment programs are yet to be researched (Prigerson et al., 2024). However, in future research, more focus on clinical samples could provide a clearer understanding of how possible interventions, for instance, fostering social functioning, might alleviate the social isolation often experienced by individuals with PGD.

Interestingly, although compared to being alone, both pleasant and unpleasant social contact were associated with lower PGD symptoms, the effect sizes were very small. This suggests that while social contact may have some immediate benefits, it likely plays a minor role in alleviating PGD symptoms in everyday life. Consequently, further research is needed to explore other potential protective factors. Besides previously studied contextual factors (Pociunaite et al., 2024), investigating psychological mechanisms like emotion regulation strategies could be aimed for. As individuals often experience social disconnectedness and feelings of isolation (Breen & O'Connor, 2008), emotion regulation strategies could play a crucial role in processing prolonged grief. In particular, examining emotion regulation strategies such as cognitive reappraisal or rumination using ESM could help explore the underlying fluctuations of regulating PGD symptoms in everyday life.

Strengths & Limitations

The present study was the first to investigate the social context and PGD symptoms of a sample with acute PGD levels in an early phase of bereavement using an intensive longitudinal research design. The research design allowed to make ecologically valid measurements and separate between from within-person effects allowing more nuanced results. The diary design of the study also minimised the recall bias, which was depicted to be an issue in cross-sectional research, especially when recalling emotional grief states (Field et al., 2006).

However, several limitations of this study must be noted. First, the recruitment method may have caused a sampling bias, as participants were recruited through a grief website offering a self-assessment and part-taking in the study. It likely excluded participants who did not actively seek out help for their grief, possibly limiting the representativeness of the sample. Secondly, intensive longitudinal designs, such as ESM, are prone to missing data. This may exclude participants experiencing severe grief more quickly, as they might not sufficiently complete the questionnaires, further contributing to sampling bias. Thirdly, this study used a simplified classification of the quality of social contact (i.e., pleasant and less pleasant social contact compared to being alone) which is beneficial for ESM as it avoids the need for complex scales. However, literature suggests that social contact or social support are rather multidimensional processes (House, 1981; Scott et al., 2020), challenging the concept of social contact within the scope of this study.

Conclusion

The present study explored the role of quality of social contact in PGD symptoms in everyday life in individuals with acute PGD. It extended previous literature, predominantly relying on cross-sectional research designs, by investigating between-person and within-person associations in a clinically relevant sample. The findings, despite small effect sizes, suggest that compared to being alone, both pleasant and less pleasant social contact were linked to lower PGD symptoms within individuals. Surprisingly, even less pleasant social contact seemed to

reduce symptoms, possibly providing a distraction from grief or isolation. These findings emphasise the importance of disaggregating between-person and within-person effects, as within-person fluctuations appear to play a more crucial role in explaining the PGD symptoms than stable between-person differences. While these findings highlight the beneficial role of social contact for individuals suffering from PGD, they also emphasise the need for further research into additional factors protecting from the adversity of prolonged grief. Despite the limitations, this research provides a contribution to previous mixed literature about the role of quality of social contact in PGD recovery. It stresses the importance of nuanced data, such as collected in ESM, in understanding the complexities of prolonged grief. In sum, this study underlines the importance of distinguishing between within-person and between-person effects when assessing the impact of the quality of social contact on PGD symptoms, providing a valuable foundation for future research and interventions.

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