



# Prolonged grief and depression after unnatural loss: Latent class analyses and cognitive correlates



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## ABSTRACT

This study sought to identify (a) subgroups among people confronted with unnatural/violent loss characterized by different symptoms profiles of prolonged grief disorder (PGD) and depression, and (b) socio-demographic, loss-related, and cognitive variables associated with subgroup membership. We used data from 245 individuals confronted with the death of a loved one due to an accident (47.3%), suicide (49%) or homicide (3.7%). Latent class analysis revealed three classes of participants: a resilient-class (25.3%), a predominantly PGD-class (39.2%), and a combined PGD/Depression-class (35.5%). Membership in the resilient-class was predicted by longer time since loss and lower age; membership in the combined class was predicted by lower education. Endorsement of negative cognitions about the self, life, the future, and one's own grief-reactions was lowest in the Resilient-class, intermediate in the PGD-class, and highest in the combined PGD/Depression-class. When all socio-demographic, loss-related, and cognitive variables were included in multinomial regression analyses predicting class-membership, it was found that negative cognitions about one's grief was the only variable predicting membership of the PGD-class. Negative cognitions about the self, life, and grief predicted membership of the combined PGD/Depression-class. These findings provide valuable information for the development of interventions for different subgroups of bereaved individuals confronted with unnatural/violent loss.

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## 1. Introduction

Since the mid-1990s, there is increasing evidence showing that, in a significant minority of people confronted with the death of a loved one, grief-symptoms persist at a distressing and disabling level. This evidence has culminated in the inclusion of persistent complex bereavement disorder (PCBD) in Section III (Conditions for Further Study) of the fifth Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) and the proposal for the inclusion of Prolonged Grief Disorder (PGD) in the forthcoming edition of the International Classification of Diseases (ICD; Maercker et al., 2013; Prigerson et al., 2009). Both PCBD and PGD are characterized by persistent separation distress combined with continued difficulties to accept the loss, to move on, and to find meaning in life without the lost person—present to the point of impairment beyond the first half-year (PGD) or year (PCBD) after bereavement.

People confronted with the death of a relative due to an unnatural

or violent cause, such as accidents, homicide or suicide, have an elevated risk to develop both disturbed grief, as well as posttraumatic stress-disorder (PTSD) and depressive symptoms (Kaltman and Bonanno, 2003; Kristensen et al., 2012). There is some evidence that this is due to the fact that, more than natural losses, violent losses lead to peritraumatic distress and dissociation (Boelen, 2015) and negative maladaptive cognitions (Boelen et al., 2015)—phenomena blocking the integration of the loss within the autobiographical database and maintaining acute distress following loss.

Research has yet to examine whether there are subgroups of bereaved individuals confronted with unnatural/violent loss characterized by different symptoms profiles of PGD/PCBD and other forms of post-loss psychopathology. Identifying such subgroups may provide valuable information for intervention efforts; if subgroups of bereaved individuals can be distinguished it may be possible to administer tailored interventions to these groups.

The current study sought to identify (a) subgroups among people confronted with unnatural/violent loss and (b) predictors and correlates of subgroup membership. We used data on symptom-levels of PGD (as defined by Prigerson et al., 2009) and depression, from 245 people confronted with the death of a loved one due to accident, homicide, or suicide. Our first aim was to

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examine whether subgroups of bereaved individuals could be identified based on their endorsement of PGD and depression symptoms. In so doing, we used latent class analysis (LCA), a person-centred method that identifies classes or subgroups of persons sharing common characteristics (Collins and Lanza, 2010). We focused on PGD and depression, and not PTSD because, unfortunately, PTSD was not assessed in this sample. However, it should be noted that depression is among the most common emotional disorders that may emerge after bereavement (Zisook and Shear, 2009). Based on prior LCA-research examining different forms of emotional distress in multiple traumatized samples (e.g., Hruska et al., 2014; Nickerson et al., 2014), we anticipated at least two different possible outcomes. One possibility was that LCA would reveal different subgroups characterized by different levels of both PGD symptoms and depression symptoms. Such a finding would indicate that people confronted with unnatural/violent loss differ in terms of the *intensity* of their symptoms rather than the nature of their symptoms. A second possibility was that subgroups would emerge with distinct PGD and depression profiles, e.g., some with only elevated PGD, others with only elevated depression, and still others with both elevated PGD and depression. This latter possibility would indicate that people confronted with unnatural/violent loss can be distinguished by the *nature* of emotional responses to violent loss.

Our second aim was to examine variables associated with subgroup membership. In so doing, we focused on socio-demographic and loss-related variables. In addition, we examined whether subgroups differed in their endorsement of different types of negative cognitions. There is growing evidence that persistent negative thinking about global belief themes including the self, life, the world, the future, and safety, as well as catastrophically interpreting one's responses to the loss is associated with psychopathology following loss (Lobb et al., 2010). In the current study, we used four subscales of the Grief Cognitions Questionnaire (GCQ; Boelen and Lensvelt-Mulders, 2005), tapping negative cognitions about the self, life, the future, and catastrophic interpretations of grief-reactions, respectively—all found to be associated with PGD severity both cross-sectionally and prospectively (Boelen et al., 2013). We examined whether these cognitions distinguish between different subgroups of people confronted with unnatural/violent loss and which cognitions differed most strongly across subgroups. Cognitive restructuring (i.e. identifying and altering maladaptive cognitions) is central to preventive (Litz et al., 2014) and curative (Boelen et al., 2013) interventions for disturbed grief. If we would be able to identify subgroups characterized by particular negative cognitions this would aid in determining which negative cognitions should be targeted in the treatment of emotional distress after unnatural/violent loss.

## 2. Method

### 2.1. Participants and procedure

The current analyses were based on data collected in a large research project examining characteristics and cognitive behavioural correlates of disturbed grief (see e.g., Boelen and Van den Bout (2005) and Boelen and Lensvelt-Mulders (2005)). In that project, 1321 individuals were recruited in different ways. One group was recruited via grief counsellors, therapists, clergy, and other people providing care for bereaved individuals. They distributed 1128 questionnaire packets, 492 (43.6%) of which were returned. Other participants were recruited via announcements on Internet websites providing information about grief. The announcements explained the aims of the project and invited people to participate by completing either an online or a paper-and-pencil version of the questionnaires. Six hundred individuals completed questionnaires online. Questionnaires were sent to the homes of 490 individuals, 260 (53.1%) of which were returned. Questionnaires differed slightly across the three groups, but all included the same measures of PGD and grief-cognitions. Participants younger than 18 years ( $n=31$ ) were excluded.

The final sample comprised 1321 individuals. Written or typewritten informed consent was obtained from all participants. Participants for the current study were the 245 bereaved individuals who were all confronted with the death of a loved one due to an accident, suicide, or homicide.

### 2.2. Measures

#### 2.2.1. Symptoms of PGD

Items to assess PGD were taken from the Inventory of Complicated Grief-revised (ICG-R). The ICG-R is a 30-item measure that includes all symptom criteria for PGD, as put forth by Prigerson et al. (2009); items are shown in Table 2. Participants rated the occurrence of symptoms in the preceding month on 5-point scales (1 = *never*, 5 = *always*). Consistent with prior LCA-research with PGD-symptoms (Nickerson et al., 2014) a dichotomous indicator variable for each symptom was derived for the present study. A symptom was considered "absent" when rated as occurring "never" or "seldom" and "present" if rated as occurring "sometimes", "often" or "always".

#### 2.2.2. Symptoms of depression

Items to assess depression were taken from the depression subscale of the Dutch Symptom Checklist (SCL-90, Arrindell and Ettema, 2003). This subscale instructs participants to rate the occurrence of depression symptoms during the preceding week on 5-point scales (1 = *not at all*, 5 = *extremely*). Because the sample size limited the number of items that could be included in the LCA, we decided to select six items, corresponding closely to DSM-IV criteria (see Table 2), excluding items that were not part of these criteria (e.g., "crying easily") and items that were ambiguous in the light of subjects' circumstances (e.g., "thoughts of death"). To obtain a dichotomous indicator variable for each symptom, a symptom was considered to be "absent" when rated as occurring "not at all" or "a little bit" and "present" if rated as occurring "moderately", "quite a bit" or "extremely".

#### 2.2.3. Negative cognitions

Negative cognitions were assessed using four subscales of the Grief Cognitions Questionnaire (GCQ; Boelen and Lensvelt-Mulders, 2005) tapping negative cognitions about the Self (six items,  $\alpha=.91$ , e.g., "Since [–] is dead, I am of no importance to anybody anymore"), Life (four items,  $\alpha=.95$ ; e.g., "My life has no purpose anymore, since [–] died"), Future (five items,  $\alpha=.92$ , e.g., "In the future I will never become really happy anymore"), and Catastrophic Misinterpretations (four items,  $\alpha=.87$ , e.g., "If I would fully realize what the death of [–] means, I would go crazy"), respectively. Items are rated on 6-point scales (1 = *disagree strongly*, 6 = *agree strongly*) and summed such that higher scores reflect stronger endorsement of the negative cognitions. Psychometric properties of the GCQ are adequate (Boelen et al., 2013).

### 2.3. Statistical analyses

We performed LCA using Mplus (version 6, Muthén and Muthén (1998–2011)) to identify classes of bereaved individuals, on the basis of dichotomously scored symptoms of PGD and depression. Full maximum likelihood estimation was used to deal with missing data. LCA identifies the minimum number of classes that can account for associations between symptoms. We first fitted the most parsimonious (one-class) model, followed by models with increasing numbers of classes to determine the number of latent classes that best fit the data. Statistical and nonstatistical criteria were used to determine the optimal number of classes. With respect to statistical criteria we evaluated the Akaike's Information Criterion (AIC) and Sample-Size Adjusted Bayesian Information Criterion (SS-BIC), with lower values indicating better model fit, plus the entropy, having values between 0 and 1 with higher values indicating better model fit. With respect to nonstatistical criteria, interpretability and size of latent classes were considered to determine the optimal number of classes.

We used chi-square tests and ANOVA's to examine whether individuals assigned to the classes differed in terms of the socio-demographic variables (i.e. gender, age, and years of education) and loss-related variables (i.e., cause of the loss [accident, suicide, or homicide], kinship to deceased [lost person was partner/spouse, child, or some other relative], and time since loss) that we assessed. We also used ANOVA's to examine whether scores on the GCQ-subscales differed between individuals assigned to the classes. All variables that were found to predict class-membership in distinct analyses, were included in multinomial logistic regression analyses in order to examine which of the predictor variables distinguished best between classes, when controlling for the shared variance between the predictor variables.

## 3. Results

### 3.1. Descriptive characteristics of the sample

In the second column of Table 1, socio-demographic and loss-related characteristics of all participants ( $N=245$ ) are displayed. As

**Table 1**  
Socio-demographic and loss-related characteristics plus scores on cognitive measures across classes.

	Total sample N=245	Class 1: Resilient (n=62, 25.3%)	Class 2: PGD (n=96, 39.2%)	Class 3: combined PGD/de- pression (n=87, 35.5%)	Significance tests for differ- ences between groups
<b>Socio-demographic variables</b>					
Gender (N (%))					$\chi^2$ (2, N=245)=1.40
Men	37 (15.1)	11 (17.7)	16 (16.7)	10 (11.5)	
Women	201 (84.9)	51 (82.3)	80 (83.3)	77 (88.5)	
Age (M (SD))	40.9 (12.4)	43.3 (12.6)	38.3 (11.2)	42.1(13.2)	F(2,244)=3.62*
Years of education (M (SD))	15.1 (3.1)	15.6 (3.5)	15.7 (3.0)	14.2 (2.8)	F(2,244)=5.56*
<b>Loss-related variables</b>					
Cause (N (%))					$\chi^2$ (4, N=245)=7.01
Accident	116 (47.3)	28 (45.2)	52 (54.2)	36 (41.4)	
Suicide	120 (49.0)	34 (54.8)	39 (40.6)	47 (54.0)	
Homicide	9 (3.7)	0	5 (5.2)	4 (4.6)	
Deceased person was a (N (%))					$\chi^2$ (4, N=245)=3.37
Partner/spouse	75 (30.5)	20 (32.3)	31 (32.3)	24 (27.9)	
Child	71 (28.9)	20 (32.3)	22 (22.9)	29 (33.7)	
Some other relative	99 (40.2)	22 (35.5)	43 (44.8)	33 (38.4)	
Time since loss (M (SD))	38.6 (42.3)	51.8 (50.8)	35.1 (38.5)	33.5 (38.5)	F(2,214)=3.98*
<b>Symptom-levels</b>					
Prolonged grief (M (SD))	28.9 (7.8)	19.1 (3.9)	28.5 (4.3)	36.3 (4.3)	F(2,244)=299.5**
Depression (M (SD))	14.5 (5.7)	9.2 (2.6)	12.9 (3.2)	20.1 (4.5)	F(2,244)=178.4**
<b>Cognitive variables</b>					
Negative cognitions about self	13.9 (8.3)	7.9 (3.7)	11.4 (5.6)	20.9 (8.2)	F(2,243)=90.14**
Negative cognitions about life	9.4 (6.2)	4.9 (2.7)	7.2 (4.1)	15.2 (5.7)	F(2,242)=116.21**
Negative cognitions about future	12.7 (6.9)	7.5 (4.2)	11.0 (5.4)	18.4 (6.0)	F(2,242)=83.23**
Catastrophic misinterpretations	11.4 (6.2)	5.9 (2.7)	11.0 (5.4)	15.6 (5.6)	F(2,243)=71.04**

Note.

\*  $p < .05$

\*\*  $p < .001$ .

shown, the participants' age averaged 40.9 years ( $SD=12.4$ ); over 80% of participants were women; 30.5% had lost a partner/spouse, 28.9% a child, and 40.2% someone else. Losses had occurred on average 38.6 months ( $SD=42.3$ ) prior to the data collection.

### 3.2. Latent class analysis

Table 2 shows fit-indices of the one to four class solutions. Based on fit-indices and interpretability of the outcomes, a three-class solution was selected as the optimal solution. The two-class solution had a higher entropy, but also yielded higher Loglikelihood, BIC, SSBIC, and AIC indices, and the solution was more difficult to interpret. The four class-solution had marginally lower scores on Loglikelihood, SSBIC, and AIC indices, but yielded a lower entropy compared to the three class solution. Moreover, the additional fourth class was not clearly different from the other three classes. Therefore, the more parsimonious three-class solution was retained.

Table 3 shows symptom prevalence rates and conditional probabilities of symptoms in the three-class solution, representing the percentage membership in each class exhibiting each PGD and depression symptom. We considered values of  $\geq .60$  as representing high probability. Class 1, referred to as the Resilient-class, included 25.3% of participants with low probabilities for all PGD-symptoms and depression-symptoms, with the exception of the "yearning and longing" symptom. Class 2, referred to as the PGD-class, included 39.2% of the participants. They evidenced high probabilities of all PGD-symptoms, except "avoiding reminders", "difficulty trusting others", and "feeling life is empty"; participants in this class evidenced low probabilities of all depression symptoms. Class 3, referred to as the combined PGD/Depression-class included 35.5% of all participants reporting high probabilities of both PGD and depression symptoms. Specifically, participants in this class had high scores on all PGD and depression symptoms, with the exception of "avoiding reminders" (PGD) and "low appetite" (depression).

**Table 2**  
Goodness-of-fit statistics for 1–6 class solutions.

Model tested	Loglikelihood	BIC	SS – BIC	AIC	Entropy
1 class	–2296.805	4681.630	4630.911	4625.610	
2 classes	–1924.977	4031.495	3926.888	3915.954	0.886
3 classes	–1859.663	3994.389	3835.893	3819.326	0.845
4 classes	–1836.295	4041.174	3828.789	3806.590	0.820

Note. AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; SS-BIC, sample size adjusted Bayesian Information Criterion.

### 3.3. Socio-demographic and loss-related correlates of class-membership

Table 1 shows the sociodemographic and loss-related characteristics of the participants included in each of the three classes. We tested for differences between classes using chi-square tests and one-way ANOVA's (also shown in Table 1). There were no differences in terms of gender. Classes differed in age; individuals in the Resilient-class were older compared to those in the PGD-class ( $p=.04$ ); the other age differences were not statistically significant. Classes also differed in terms of years of education; people in the combined class had fewer years of education compared with those in the PGD-class ( $p < .01$ ) and the Resilient-class ( $p < .05$ ), whereas years of education did not differ between the latter two classes. Classes also differed in terms of time since loss, such that for those in the Resilient-class the loss had occurred longer ago, compared to the PGD-class and the combined class ( $ps < .05$ ), who did not differ from each other. Groups did not differ in terms of kinship and cause of death (accident, suicide, or homicide).

### 3.4. Cognitive correlates of class-membership

ANOVAs showed that classes differed significantly in terms of scores on the four GCQ subscales (see Table 1). Post-hoc tests

**Table 3**  
Probability of item endorsement for prolonged grief symptoms and depression symptoms for 3-class solution.

	Overall symptom frequency		Class 1: Resilient (n=62, 25.3%)		Class 2: PGD (n=96, 39.2%)		Class 3: Combined PGD/depression (n=87, 35.5%)	
	N	Probability	Probability	SE	Probability	SE	Probability	SE
<b>Prolonged grief symptoms</b>								
Longing or yearning	235	0.959	<b>0.886</b>	0.043	<b>0.979</b>	0.016	<b>0.987</b>	0.013
Feeling part of self died	196	0.800	0.495	0.071	<b>0.821</b>	0.049	<b>0.988</b>	0.012
Difficulty accepting death	170	0.694	0.331	0.077	<b>0.806</b>	0.049	<b>0.819</b>	0.045
Avoiding reminders of death	41	0.167	0.000	0.000	0.170	0.046	0.280	0.052
Difficulty trusting others	120	0.492	0.148	0.053	0.396	0.057	<b>0.844</b>	0.062
Bitterness or anger	176	0.718	0.306	0.078	<b>0.739</b>	0.053	<b>0.981</b>	0.019
Impaired functioning because of death	172	0.661	0.185	0.061	<b>0.687</b>	0.064	<b>0.963</b>	0.023
Numbness	144	0.588	0.049	0.045	0.595	0.059	<b>0.954</b>	0.037
Feeling life is empty	109	0.445	0.000	0.000	0.372	0.076	<b>0.837</b>	0.046
Feeling stunned	177	0.725	0.205	0.080	<b>0.805</b>	0.047	<b>1.000</b>	0.000
<b>Depression symptoms</b>								
Low energy	92	0.377	0.162	0.052	0.266	0.055	<b>0.650</b>	0.061
Low appetite	34	0.139	0.034	0.023	0.000	0.000	0.370	0.072
Blaming yourself for things	83	0.340	0.036	0.026	0.199	0.055	<b>0.708</b>	0.062
Feeling down	116	0.475	0.022	0.023	0.400	0.075	<b>0.871</b>	0.045
No interest in things	138	0.566	0.077	0.041	0.508	0.081	<b>0.966</b>	0.024
Feeling worthless	126	0.516	0.276	0.062	0.485	0.057	<b>0.717</b>	0.062

Note. Values in bold indicate that individuals in this class had a high probability of reporting this symptom ( $\geq 0.60$ ).

showed that participants in the Resilient-class scored significantly lower than the other two classes, and the PGD-class scored significantly lower than the combined class (all  $ps < .01$ ).

3.5. Multinomial logistic regression analyses

Multinomial logistic regressions were conducted to examine which variables were the most important predictors of class membership when controlling for the shared variance between predictor variables. The participant's age and years of education,

time since loss, and scores on the four cognitive variables were included as predictor variables. We subsequently compared (i) the PGD-class with the Resilient-class, (ii) the combined class with the Resilient-class, and (iii) the PGD-class with the combined class. Outcomes are shown in Table 4. Compared to those in the Resilient-class, individuals in the PGD-class were more likely to assign catastrophic interpretations to their grief reactions; none of the other variables uniquely distinguished between the two classes. Compared to those in the Resilient-class, participants in the combined PGD/Depression-class were more likely to endorse

**Table 4**  
Multinomial logistic regression predicting class membership.

	B	SE (B)	Exp (B)	95% confidence interval		p
Class 2 (PGD) vs. Class 1 (Resilient)						
Age	-.021	.018	0.979	0.945	1.014	.228
Years of education	.080	.069	1.083	0.945	1.241	.251
Time since loss	-.008	.005	0.992	0.983	1.001	.093
Negative cognitions about self	.051	.063	1.052	0.929	1.191	.422
Negative cognitions about life	.026	.104	1.026	0.837	1.258	.804
Negative cognitions about future	.079	.069	1.082	0.945	1.238	.255
Catastrophic misinterpretations	.262	.068	1.300	1.137	1.486	.000
Class 3 (PGD/Depression) vs. Class 1 (Resilient)						
Age	-.012	.023	0.988	0.945	1.034	.611
Years of education	.009	.090	1.009	0.846	1.204	.919
Time since loss	-.012	.007	0.988	0.974	1.002	.088
Negative cognitions about self	.140	.068	1.151	1.007	1.315	.039
Negative cognitions about life	.249	.112	1.283	1.031	1.597	.026
Negative cognitions about future	.044	.082	1.045	0.890	1.227	.590
Catastrophic misinterpretations	.274	.076	1.315	1.133	1.525	.000
Class 3 (PGD/Depression) vs. Class 2 (PGD)						
Age	.010	.018	1.010	.975	1.045	.585
Years of education	-.071	.069	.932	.813	1.068	.310
Time since loss	-.004	.006	.996	.984	1.008	.493
Negative cognitions about self	.090	.038	1.094	1.015	1.178	.018
Negative cognitions about life	.223	.069	1.250	1.093	1.431	.001
Negative cognitions about future	-.034	.057	.966	.865	1.080	.543
Catastrophic misinterpretations	.011	.043	1.011	.929	1.101	.792

negative cognitions about the self, about life, and to catastrophically misinterpret their grief-reactions. Finally, negative cognitions about the self and life were the only variables distinguishing between the PGD-class and the combined PGD/Depression-class.

#### 4. Discussion

We used LCA to identify distinct subgroups or classes among people confronted with the death of a loved one due to an unnatural/violent cause, based on symptoms of PGD and depression. Three subgroups were identified: a resilient class characterized by an elevated score on one symptom of PGD only (i.e., yearning for the deceased), a predominantly PGD-class characterized by elevated endorsement of all but four PGD-symptoms and none of the depression symptoms, and a combined PGD/Depression-class characterized by elevated scores on almost all PGD symptoms and depression symptoms. Nickerson et al. (2014) studied symptom profiles of PGD and PTSD among Mandaean adult refugees confronted with traumatic loss and identified four classes, including a resilient class, a predominantly PGD-class, a predominantly PTSD-class, and a combined PTSD/PGD class. Taken together, findings of both studies indicate that in people confronted with unnatural loss, subgroups exist that can be distinguished in terms of the dominance of particular syndromes (e.g., some with predominantly PGD, some with comorbid symptom clusters) rather than by graded severity of a more general post-loss response. The fact that in the present study one class emerged with primarily elevated symptom scores of PGD suggests that PGD symptoms are distinctive from depression symptoms. This finding accords with prior symptom-based analyses showing that PGD-symptoms are correlated with, yet distinguishable from symptoms of depression (e.g., Boelen and Van den Bout, 2005). We did not find a class that contained individuals who mainly displayed elevated depression symptoms. It is possible that depression without PGD is more common among bereaved individuals confronted with natural losses, such as deaths due to illness (but see Stammel et al. (2013)). Future research is needed to examine whether the classes identified in this study extend to other bereaved populations.

With respect to sociodemographic variables, we found that those in the Resilient-class were older compared to those in the PGD-class. This contrasts with Nickerson et al.'s (2014) findings that more pervasive disturbance was observed among older people. We also found less years of education to predict membership of the combined PGD/depression group; this is also in agreement with prior findings that low education is a vulnerability factor for disturbed grief (Lobb et al., 2010). Not unexpectedly, time since loss differed between groups, such that for participants in the Resilient-class their loss had occurred longer ago. Participants in the PGD-class and the combined PGD/Depression-class did not differ in terms of time since loss. Thus, to the extent that emotional distress diminishes as time progresses, time does not determine whether a person continues to experience PGD or a combination of PGD and depression.

We also found that the endorsement of negative cognitions about the self, life, the future, and catastrophic misinterpretations was lowest in the Resilient-class, significantly higher in the PGD-class, and the highest in the combined PGD/Depression-class. These findings indicate that these negative cognitions distinguish meaningfully between subgroups of people, with people with the most pervasive emotional problems tending to have the strongest negative cognitions about themselves, and their lives, futures, and own responses to the loss. These findings accord with prior findings showing that negative cognitions are a vulnerability factor for poor bereavement outcome (Boelen et al., 2013).

Interesting findings emerged in our multinomial regression

analyses testing which of the socio-demographic, loss-related, and cognitive variables distinguished best between classes. Catastrophic misinterpretations of grief were the only variable that significantly distinguished the PGD-class from the Resilient-class; this adds to prior evidence that such misinterpretations predict poor bereavement outcomes (Van der Houwen et al., 2010). Negative cognitions about the self, life, plus these catastrophic misinterpretations distinguished between the combined PGD/depression-class and the Resilient-class, and negative cognitions about the self and life distinguished the PGD-class from the combined PGD/depression-class. These findings indicate that it is the tendency to assign catastrophic interpretations to one's grief reactions, combined with a relatively benign view of self and life, that elevates the risk of normal grief turning into PGD—whereas similar catastrophic misinterpretations combined with negative views of self and life render a person prone to a combination of PGD and depression.

The findings of our study shed some light on the extent to which diagnostic criteria for PGD proposed for ICD-11 as put forth by Prigerson et al. (2009) are applicable across different groups of bereaved individuals. For instance, the “yearning” symptom was highly prevalent across all three groups, whereas the “avoidance” symptom evidenced low probabilities across all three groups; this suggests that these two symptoms are less important in distinguishing between subgroups of people exposed to unnatural loss. More generally, these findings accord with prior evidence that these two symptoms distinguish poorly between bereaved people with resilient vs. disturbed outcomes (Boelen and Hoijtink, 2009). Notably, PGD symptoms “difficulty trusting others” and “feeling that life is empty” were more strongly endorsed in the combined PGD/Depression group than in the PGD group; this suggests that, more than other PGD symptoms, these two symptoms are important markers for combined symptoms of disturbed grief and depression. Of note here is that difficulty trusting others can negatively affect the quality of interpersonal relationships. This could in part explain why this PGD symptom is associated with depression symptoms as well as other PGD symptoms.

There are several limitations that should be addressed. First, our analyses relied on a heterogeneous sample, some self-selected, others recruited via grief-counsellors or other caretakers. Future studies are needed to examine the generalizability of the present findings to more homogenous samples, including clinical groups. A second limitation is the lack of an assessment of PTSD symptoms. It would be relevant for future studies to examine patterns in symptoms of PGD, depression, and PTSD among those exposed to violent loss. Thirdly, the size of the sample was limited and likely affected outcomes. For instance, it is possible that the clustering of less common but reliable symptom presentations would emerge with larger samples. Moreover, larger samples would allow for a more thorough examination of predictors of class membership. A further limitation is that we used self-report measures rather than clinical interviews to assess PGD and depression; consequently, this study informs us about co-occurring symptoms, but not about the comorbidity of clinical diagnoses of PGD and depression.

Notwithstanding these considerations, our findings add to prior evidence that individuals confronted with unnatural loss can be distinguished into subgroups of people with resilient outcomes, those with predominantly PGD, and those with comorbid symptoms (cf. Nickerson et al., 2014) and prior evidence that negative cognitions are important correlates of psychopathology following loss (Boelen et al., 2013). On the condition that the findings are replicated, they bear clinical implications. For instance, findings suggest that different interventions are required for different subgroups of bereaved persons—with interventions addressing depressive symptoms (e.g., pleasant event scheduling to increase positive affect, cognitive restructuring focused on negative views

of the self and life) being explicitly included in treatment for those presenting with comorbid PGD and depression. Additionally, given the propensity of depression to recur, especially in persons who experienced earlier depressive episodes (Solomon et al., 2000), prevention of recurrence may be an additional focus in the treatment of bereaved persons with comorbid PGD and depression who experienced earlier depressive episodes.

## References

- American Psychiatric Association, 2013. *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. American Psychiatric Publishing, Arlington, VA.
- Arrindell, W.A., Ettema, J., 2003. Symptom checklist. Handleiding bij een multi-dimensionele psychopathologie-Indicator. Swets & Zeitlinger, Lisse.
- Boelen, P.A., 2015. Peritraumatic distress and dissociation in prolonged grief and post-traumatic stress following violent and unexpected deaths. *J. Trauma Dis-sociation* 16, 541–550.
- Boelen, P.A., van den Bout, J., 2005. Complicated grief, depression, and anxiety as distinct post-loss syndromes: a confirmatory factor analysis study. *Am. J. Psy-chiatry* 162, 2175–2177.
- Boelen, P.A., Hoijtink, H., 2009. An item response theory analysis of a measure of complicated grief. *Death Stud.* 33, 101–129.
- Boelen, P.A., Hout, M.A., van den Bout, J., 2013. Prolonged grief disorder: cognitive behavioral theory and therapy. In: Stroebe, M.S., Schut, H., van den Bout, J. (Eds.), *Complicated Grief*. Routledge, New York, pp. 221–234.
- Boelen, P.A., Keijsers, J., de, Smid, G., 2015. Cognitive behavioural variables mediate the impact of violent loss on post-loss psychopathology. *Psychol. Trauma: Theory Res., Pract., Policy* 7, 382–390.
- Boelen, P.A., Lensvelt-Mulders, G.J.L.M., 2005. Psychometric properties of the Grief Cognitions Questionnaire (GCQ). *J. Psychopathol. Behav. Assess.* 27, 291–303.
- Collins, L.M., Lanza, S.T., 2010. *Latent Class and Latent Transition Analysis: With Applications in the Social, Behavioral, and Health Sciences*. Wiley, New York.
- Hruska, B., Irish, L.A., Pacella, M.L., Sledjeski, E.M., Delahanty, D.L., 2014. PTSD symptom severity and psychiatric comorbidity in recent motor vehicle accident victims: a latent class analysis. *J. Anxiety Disord.* 28, 644–649.
- Kaltman, S., Bonanno, G.A., 2003. Trauma and bereavement: examining the impact of sudden and violent deaths. *J. Anxiety Disord.* 17, 131–147.
- Kristensen, P., Weisæth, L., Heir, T., 2012. Bereavement and mental health after sudden and violent losses: a review. *Psychiatry* 75, 76–97.
- Litz, B., Schorr, Y., Delaney, E., Au, T., Papa, A., Fox-Gallais, A., Prigerson, H.G., 2014. A randomized controlled trial of an internet-based therapist-assisted indicated preventive intervention for prolonged grief disorder. *Behav. Res. Ther.* 61, 23–34.
- Lobb, E.A., Kristjanson, L.J., Aoun, S.M., Monterosso, L., Halkett, G.K., Davies, A., 2010. Predictors of complicated grief: a systematic review of empirical studies. *Death Stud.* 34, 673–698.
- Maercker, A., Brewin, C.R., Bryant, R.A., Cloitre, M., van Ommeren, M., Jones, L.M., Reed, G.M., 2013. Diagnosis and classification of disorders specifically asso-ciated with stress: proposals for ICD-11. *World Psychiatry* 12, 198–206.
- Muthén, L.K., Muthén, B.O., 2011. *Mplus User's Guide*. Muthén & Muthén, Los An-geles, CA (Sixth edition).
- Nickerson, A., Liddell, B.J., Maccallum, F., Steel, Z., Silove, D., Bryant, R.A., 2014. Posttraumatic stress disorder and prolonged grief in refugees exposed to trauma and loss. *BMC Psychiatry* 14, 106–117.
- Prigerson, H.G., Horowitz, M.J., Jacobs, S.C., Parkes, C.M., Aslan, M., Goodkin, K., Maciejewski, P.K., 2009. Prolonged grief disorder: psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Med.* 6 (8), e1000121.
- Solomon, D.A., Keller, M.B., Leon, A.C., Mueller, T.I., Lavori, P.W., Shea, M.T., et al., 2000. Multiple recurrences of major depressive disorder. *Am. J. Psychiatry* 157, 229–233.
- Stammel, N., Heeke, C., Bockers, E., Chhim, S., Taing, S., Wagner, B., et al., 2013. Prolonged grief disorder three decades post loss in survivors of the Khmer Rouge regime in Cambodia. *J. Affect. Disord.* 144, 87–93.
- Van der Houwen, K., Stroebe, M., Schut, H., Stroebe, W., Van den Bout, J., 2010. Mediating processes in bereavement: the role of rumination, threatening misinterpretations, and deliberate grief avoidance. *Soc. Sci. Med.* 71, 1669–1676.
- Zisook, S., Shear, M.K., 2009. Grief and bereavement: What psychiatrists need to know. *World Psychiatry* 8, 67–74.