



# Prolonged grief and posttraumatic stress in bereaved children: A latent class analysis



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## ABSTRACT

Few studies have yet examined subgroups among children (aged 8–18) confronted with the death of a close loved one, characterized by different profiles of symptoms of prolonged grief disorder (PGD) and symptoms of bereavement-related posttraumatic stress disorder (PTSD). This study sought to identify such subgroups and socio-demographic and loss-related variables associated with subgroup membership. We used data from 332 children, most of whom (> 80%) were confronted with the death of a parent, mostly (> 50%) due to illness. Latent class analysis revealed three classes of participants: a resilient class (38.6%), a predominantly PGD class (35.2%), and a combined PGD/PTSD class (26.2%). Class membership was associated with self-rated levels of depression and functional impairment, and parent-rated behavioural problems. No significant between-class differences on demographics or loss-related variables were found. The current findings of distinct classes of PGD, and PGD plus PTSD attest to the construct validity of PGD as a distinct disorder, and can inform theory building and the development of diagnostic instruments relevant to children with pervasive distress following loss.

## 1. Introduction

The death of a parent or sibling is one of the most common stressful life events that children can experience during childhood (Alisic et al., 2008). In recent years, advances have been made in our understanding of the phenomenology and course of grief in children. For most children, grief reactions abate over time. However, a significant subgroup of children shows serious emotional problems that persist over time, associated with distress and functional impairment (Melhem et al., 2011). Symptoms observed among these children include symptoms of posttraumatic stress disorder (PTSD; Stoppelbein and Greening, 2000) and Prolonged Grief Disorder (PGD; e.g., Melhem et al., 2013). Bereavement-related PTSD is characterized by intrusive thoughts and images about, and avoidance of cues associated with circumstances of the loss (APA, 2013; Stoppelbein and Greening, 2000). PGD is characterized by pervasive separation distress, shock, disbelief, and a changed worldview (Boelen and Smid, 2017; Prigerson et al., 2009).

Criteria for PGD were proposed by Prigerson et al. (2009) and will, in a shorter version, be included in the forthcoming ICD-11 (Maciejewski et al., 2016).<sup>1</sup> PGD symptoms overlap with symptoms of

Persistent Complex Bereavement Disorder (PCBD) a condition that is included in Section III of DSM-5 (APA, 2013). According to some (e.g., Kaplow et al., 2012), PCBD offers a more accurate description of disturbed grief in children because it more strongly frames maladaptive grief as a problem of inadequate adaptation to changes brought about by the loss and also includes circumstances-related distress not explicitly listed among the PGD criteria (see also Claycomb et al., 2016). Others favour criteria for PGD because of the brevity, clinical utility, and established predictive validity of these criteria (Melhem et al., 2013). The current study focused on symptoms of PGD as put forth by Prigerson et al. (2009) rather than PCBD as per DSM-5 for these reasons and because all PGD (but not all PCBD criteria) mapped onto our measure of grief (as is further described below).

To our knowledge, no studies have yet examined whether distinct subgroups of bereaved children can be identified, which are characterized by different symptom profiles of PGD and bereavement-related PTSD. In the current study we used latent class analysis (LCA) to identify subgroups characterized by different symptom profiles of PGD and bereavement-related PTSD, in a sample of 8–18 year old children, confronted with the death of a close relative. LCA is a person-centred

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<sup>1</sup> In the ICD-11, symptoms of separation distress present to the point of impairment beyond six months after the loss will be central to the criteria. Some other grief reactions also listed in the Prigerson et al. (2009) proposal will be included in the ICD-11 criteria (Boelen and Smid, 2017). The exact list of criteria eventually selected is still not definitive and this is one of the reasons why we, in the current study, focused on Prigerson et al.'s proposal rather than the now still provisional ICD-11 proposal.

**Table 1**  
Demographic variables, loss-related characteristics, and symptom-scores in total sample and classes.

	Total sample (N = 332)	Class 1 (n = 128, 38.6%); Resilient	Class 2 (n = 117, 35.2%); PGD	Class 3 (n = 87, 26.2%); Combined PGD and PTSD	Test for difference
<b>Demographic characteristics:</b>					
Gender (N (%))					$\chi^2(2, N = 332) = 4.13$
Boys	143 (43.1)	62 (48.4)	51 (43.6)	30 (34.5)	
Girls	189 (56.9)	66 (51.6)	66 (56.4)	57 (65.5)	
Age (years) (M (SD); range)	11.9 (2.9); 8–18	11.8 (2.6)	11.6 (2.9)	12.5 (3.1)	$F(2, 331) = 2.95^*$
Religiously active (N (%))					$\chi^2(2, N = 332) = 0.54$
Yes	110 (33.3)	44 (34.9)	36 (30.8)	30 (34.5)	
No	220 (66.7)	82 (65.1)	81 (69.2)	57 (65.5)	
<b>Loss characteristics:</b>					
Deceased is (N (%))					$\chi^2(6, N = 327) = 4.08$
Mother	80 (24.5)	28 (22.0)	31 (27.2)	21 (24.4)	
Father	186 (56.9)	76 (59.8)	60 (52.6)	50 (58.1)	
Sibling	29 (8.9)	14 (11.0)	9 (7.9)	6 (7.0)	
Other relative	32 (9.8)	9 (7.1)	14 (12.3)	9 (10.5)	
Cause of death is (N (%))					$\chi^2(6, N = 330) = 5.51$
Illness	182 (55.2)	69 (54.3)	69 (59.0)	44 (51.2)	
Violent (accident, suicide, homicide)	75 (22.4)	33 (26.0)	21 (17.9)	20 (23.3)	
Unexpected medical cause	62 (18.8)	21 (16.5)	24 (20.5)	17 (19.8)	
Other cause	12 (3.6)	4 (3.1)	3 (2.6)	5 (5.8)	
Experienced loss as unexpected? (N (%))					$\chi^2(2, N = 329) = 1.64$
Yes	103 (31.3)	45 (35.4)	33 (28.7)	25 (28.7)	
No	226 (68.7)	82 (64.6)	82 (71.3)	62 (71.3)	
Time since loss (months) (M (SD); range)	32.6 (25.5); 1–119	35.8 (27.9)	31.7 (25.1)	29.2 (22.4)	$F(2, 310) = 1.75$

Note. Samples sizes differ due to occasional missing values.

\*  $p < 0.10$ .

method that can be used to determine how individuals cluster together into relatively homogeneous latent classes, based on shared symptom patterns (Collins and Lanza, 2013).

Based on prior LCA research in traumatized and bereaved samples (Au et al., 2013; Hebenstreit et al., 2014; Galatzer-Levy et al., 2013), we considered two different outcomes plausible. The first possible outcome was that subgroups of bereaved children would emerge with high PGD and low bereavement-related PTSD symptoms (or vice versa). This would indicate that children confronted with loss can be distinguished by the nature of emotional responses to loss. A second possible outcome was that LCA would reveal different subgroups characterized by increasing probabilities (e.g., low, moderate, high probability) of endorsing both PGD and bereavement-related PTSD. Based on prior LCA research in bereaved samples (Boelen et al., 2016; Nickerson et al., 2014) and research supporting the distinctiveness of children's PGD from other disorders (Dillen et al., 2009; Spuij et al., 2012b) we considered the first outcome to be more likely.

Information about different subgroups is useful for a number of reasons. In general, there is a need to increase knowledge about clinical manifestations of distress following loss in children, including whether elevations in one domain (e.g., yearning or other manifestations of grief) coincide with elevations in another domain (e.g., intrusive images of the death-event or symptoms of bereavement-related PTSD; cf. Claycomb et al., 2016). Clarifying the relationship between PGD and bereavement-related PTSD following loss potentially has conceptual, diagnostic, and treatment implications. For instance, if PGD and such PTSD are manifestations of one single dimension of loss-related psychopathology (manifested in the emergence of subgroups with increasing probabilities of endorsing PGD and PTSD) that could suggest that it is efficient and effective to develop diagnostic instruments and treatment interventions targeting both PGD and PTSD.

Apart from investigating what subgroups could be identified based on symptom profiles of PGD and bereavement-related PTSD, this study had two further goals. The first of these was to test whether different profiles of PGD and bereavement-related PTSD predicted meaningful differences in functional impairment, depression, and parent-rated internalizing and externalizing problems. Based on prior evidence that elevated PGD and bereavement-related PTSD are associated with

different indices of malfunctioning (e.g., Melhem et al., 2007, 2011) it was anticipated that the more disturbed classes (with more pervasive problems) would score high on indices of malfunctioning. The final goal of this study was to examine differences between subgroups in terms of sociodemographic and loss-related variables. It is unclear whether manifestations of PGD and bereavement-related PTSD symptoms differ as a function of these variables. Because, in general, there is little knowledge about risk factors of poor bereavement outcome in children (e.g. Melhem et al., 2004) this issue was examined in an exploratory manner.

## 2. Method

### 2.1. Participants and procedure

Data were available from 332 children and adolescents, aged 8–18 years, participating in a project studying the phenomenology and correlates of children's grief. We reported on these data in an earlier study that examined the factor structure of bereavement-related PTSD (Boelen and Spuij, 2013). Participants were recruited from different sources. One hundred and twenty-six participants were recruited via a bereavement support organisation. During the period of data-collection, children and adolescents applying for support-weekends were sent a letter with information about the study and a stamped refusal card. If no refusal card was received within two weeks, the family was contacted and—if the parent(s) and their child agreed to participate—a home visit was planned. During this visit, questionnaires were administered, supervised by bachelor-level students. A further 206 participants were recruited from different out-patient clinics in the Netherlands, where consecutive patients aged 8–18 years applying for help for emotional problems associated with loss were invited to participate. Those who did so, completed questionnaires accompanied by their therapist. Assent was obtained from children (aged 8–12 years), informed consent from parents and adolescents (aged 13–18 years). The response rate was not systematically registered but was estimated to be over 80%. Participants were not compensated for their participation.

Participants recruited from bereavement support organisations ( $n = 126$ ) and those recruited from outpatient clinics ( $n = 206$ ) did not

differ on variables assessed for the present study and were combined in the analyses. In the second column of Table 1 socio-demographic and loss-related characteristics of the 332 participants are displayed. As shown, participants had a mean age of 11.9 years ( $SD = 2.9$ ); 189 (56.9%) participants were girls. Most participants had experienced the death of a parent. Most losses were caused by illness, on average 32.6 months ( $SD = 25.5$ ) prior to the data collection.

## 2.2. Measures

### 2.2.1. Demographic and loss-related variables

We collected data on the (a) gender of the participant, (b) age of the participant, (c) whether s/he was actively religious (yes/no), (d) the relationship to the deceased (categorized as mother, father, sibling, or other loved one), (e) the cause of death (illness, violent cause [accident, suicide, homicide], unexpected medical cause [e.g., heart attack], or some other cause), (f) whether the death was experienced as unexpected (yes/no), and (g) the time passed since the death occurred.

### 2.2.2. Inventory of Prolonged Grief for Children (IPG-C) and Inventory of Prolonged Grief for Adolescents (IPG-A)

The IPG-C and IPG-A are both 30 item measures tapping all ten symptom criteria of PGD as put forth by Prigerson et al. (2009) as well as other putative markers of disturbed grief. They were developed by Spuij et al. (2012a) based on the (adult) revised Inventory of Complicated Grief (ICG-R; Prigerson and Jacobs, 2001). Development of the measures was accomplished in several consecutive steps including (i) simplification of the wording of the ICG-R items by three clinical child psychology experts, (ii) evaluation of this version by two experts on psychological assessment for youths, one expert on child language, and two clinical child psychologists with expertise in grief, (iii) development of a children's version and adolescent version, with small differences in wording of some of the items, (iv) review of the comprehensibility and clarity of items and response format by five children (aged 8–12) and five adolescents (aged 13–18), leading to minor changes in wording, and (v) further evaluation by three (other) children and three other adolescents. Examination of the psychometric properties showed, among other things, that the IPG-C and IPG-A both formed a one-factor scale, with adequate internal consistency, short-term temporal stability, and convergent and divergent validity. (For further information, see Spuij et al., 2012a.) Respondents rate the frequency of symptoms on 3-point scales (1 = *almost never*, 2 = *sometimes*, 3 = *always*). The IPG-C and IPG-A are similar although the wording of some of the items differs slightly between the versions. The  $\alpha$  in the present sample for the IPG-C was 0.91 and the IPG-A was 0.94.

### 2.2.3. Child PTSD Symptom Scale (CPSS)

The CPSS (Foa et al., 2001) was used to assess bereavement-related PTSD in accord with criteria listed in DSM-IV (APA, 2000). Respondents rated the occurrence of 17 symptoms on 4-point scales, with the loss as the anchor event. The CPSS also includes seven items tapping functional impairment experienced as a result of these symptoms, scored as 0 = *absent* or 1 = *present*. The summed score of these items represents an overall impairment severity score. English (Foa et al., 2001) and Dutch (Engelhard, 2005) versions of the CPSS have adequate psychometric properties (cf. Hamdan et al., 2012). The internal reliability in the present sample was 0.90 (Cronbach's  $\alpha$ ) for the first 17 items and 0.67 (Kuder-Richardson 20) for the 7 functional impairment items.

### 2.2.4. Children's Depression Inventory (CDI)

The CDI is a 27-item measure assessing cognitive, affective, and behavioural symptoms of depression (Kovacs, 2003), Dutch version: Timbremont et al. (2008)). Each item contains three statements representing depressive symptoms at increasing levels of severity, from which respondents select one statement that best describes how they felt in the preceding week. The  $\alpha$  in the present sample was 0.86.

### 2.2.5. Child Behaviour Checklist/6–18 (CBCL)

The CBCL is a measure of emotional and behavioural problems constructed by Achenbach and Rescorla (2001). Its 118 items are rated on 3-point scales (0 = *not true*, 1 = *somewhat/sometimes true*, 2 = *very true/often true*) and represent different problem areas (e.g., anxious, depressive, somatic symptoms, aggression). In accord with the way the measure is generally used in the Netherlands (Verhulst et al., 1996), the CBCL was completed by both parents/caretakers in case the child was living with both parents/caretakers. In all other cases (when one of the parents had died or parents were divorced) one parent/caretaker completed the measure. When both parents/caretakers completed the scale, we only used data from one randomly selected parent/caretaker.<sup>2</sup> Items are summed to obtain indices of Internalizing Problems and Externalizing Problems. The summed score of all items represents a Total Problem score. Research has supported the psychometric properties of the original CBCL (Achenbach and Rescorla, 2001) and its Dutch version (Verhulst et al., 1996). In the current sample, the  $\alpha$ 's of the Internalizing subscale, the Externalizing subscale, and the total scale were 0.95, 0.89, and 0.91 respectively.

## 2.3. Statistical analyses

LCA was conducted using Mplus Version 7.3 (Muthén and Muthén, 2014). We examined how many classes of bereaved children could be identified based on dichotomously scored symptoms of PGD and bereavement-related PTSD.<sup>3</sup> We selected 10 items from the IPG that mapped very closely onto the 10 criteria of PGD as proposed by Prigerson et al. (2009); these items are briefly worded in Table 2. As indicators of bereavement-related PTSD, we used all items from the CPSS representing PTSD symptoms as per DSM-IV (APA, 2000). To enable LCA, all item scores were dichotomized. In so doing, we derived dichotomous indicators reflecting the absence or presence of each symptom which is consistent with prior LCA research on grief (e.g., Boelen et al., 2016; Nickerson et al., 2014) and traumatic stress (e.g., Ayer et al., 2011). Specifically, PGD symptoms were considered absent if the frequency was rated as 1 = *almost never*, and present if rated as 2 = *sometimes* or 3 = *always*. PTSD symptom were dichotomized by considering scores 0 = *not at all/only at one time* and 1 = *once a week or less/once in a while as symptom being absent* and scores 2 = *two to four times a week/half the time* and 3 = *almost always/five or more times a week as symptom being present*.<sup>4</sup>

Of all 27 items included in the LCA, five items had one or two missing values (< 1% of all responses). Little's MCAR test (chi square = 11.04,  $df = 101$ ,  $p = 0.15$ ) indicated that data were missing completely at random. Full maximum likelihood estimation was used to handle missing data.

To determine the optimal number of latent classes, we first fitted the most parsimonious (one class) model followed by models with increasing numbers of classes. In keeping with recommendations (e.g., Vermunt and Magidson, 2002) class solutions were compared and evaluated based on equal considerations of parsimony, fit statistics, and interpretability. With respect to statistical criteria, we evaluated the

<sup>2</sup> Random selection seemed justified given that correlations between the father's and mother's version, if available, were high. Specifically, for children for whom CBCL data were available from both parents, correlations between scores of the fathers and mothers for the Internalizing, Externalizing, and Total score were at least  $r = 0.86$  ( $p < 0.001$ ).

<sup>3</sup> LCA resembles Latent Profile Analyses (LPA). LPA can be used to examine how participants group together based on their continuous scores on clusters of symptoms or diagnostic categories. We, however, used LCA because it was our intention to examine how bereaved children grouped together based on their scores on the full range of PGD and bereavement-related PTSD symptoms rather than clusters of symptoms or diagnostic categories of PGD/ bereavement-related PTSD.

<sup>4</sup> Using the highest category as representing symptom presence would be possible but would yield ambiguous categories: i.e., 0 = *symptom absent or sometimes present* vs. 1 = *symptom always present*. That categorization was deemed less suitable for the current study.

**Table 2**  
Probability of item endorsement for symptoms of prolonged grief and posttraumatic stress for 3-class solution.

	Overall symptom frequency		Class 1 (n = 128, 38.6%) Resilient		Class 2 (n = 117, 35.2%) PG		Class 3 (n = 87, 26.2%) Combined PG and PTS	
	N	%	Probability	SE	Probability	SE	Probability	SE
<b>Prolonged Grief</b>								
Yearning for the lost person	311	0.937	<b>0.847</b>	0.053	<b>0.983</b>	0.013	<b>1.000</b>	0.000
Feeling that part of self died	186	0.564	0.352	0.069	<b>0.558</b>	0.058	<b>0.866</b>	0.069
Difficulties accepting the loss	273	0.822	<b>0.630</b>	0.098	<b>0.939</b>	0.027	<b>0.935</b>	0.028
Avoiding reminders of the loss	180	0.544	0.351	0.088	<b>0.577</b>	0.057	<b>0.770</b>	0.075
Difficulty trusting others	92	0.279	0.064	0.053	0.208	0.055	<b>0.675</b>	0.097
Bitterness or anger	148	0.447	0.181	0.070	0.470	0.082	<b>0.783</b>	0.051
Difficulty moving on	150	0.453	0.103	0.033	<b>0.534</b>	0.176	<b>0.836</b>	0.047
Numbness	117	0.352	0.096	0.052	0.379	0.080	<b>0.674</b>	0.067
Feeling that life is meaningless	151	0.455	0.163	0.063	<b>0.601</b>	0.085	<b>0.667</b>	0.055
Stunned	184	0.554	0.225	0.091	<b>0.686</b>	0.056	<b>0.836</b>	0.081
<b>Posttraumatic Stress</b>								
Intrusive thoughts	76	0.229	0.031	0.018	0.173	0.095	<b>0.578</b>	0.068
Dreams/nightmares	55	0.166	0.027	0.017	0.075	0.058	0.479	0.069
Flashbacks	55	0.166	0.024	0.017	0.098	0.060	0.452	0.067
Emotional reactivity	129	0.389	0.046	0.059	0.407	0.111	<b>0.839</b>	0.057
Physical reactivity	80	0.241	0.021	0.036	0.169	0.056	<b>0.642</b>	0.096
Avoiding thoughts	108	0.325	0.069	0.030	0.346	0.095	<b>0.654</b>	0.075
Avoiding reminders	62	0.187	0.050	0.023	0.127	0.045	0.456	0.085
Inability to recall moments	58	0.175	0.069	0.025	0.174	0.054	0.323	0.056
Loss of interest	61	0.184	0.000	0.000	0.140	0.075	0.497	0.074
Detachment	43	0.130	0.000	0.000	0.079	0.046	0.376	0.079
Restricted affect	55	0.166	0.009	0.010	0.132	0.084	0.428	0.058
Foreshortened future	46	0.139	0.013	0.013	0.067	0.043	0.409	0.078
Disturbed sleep	135	0.407	0.117	0.035	0.458	0.121	<b>0.741</b>	0.068
Irritability/anger	106	0.319	0.070	0.032	0.240	0.122	<b>0.770</b>	0.077
Difficulties concentrating	124	0.373	0.110	0.036	0.359	0.115	<b>0.759</b>	0.069
Hypervigilance	39	0.117	0.000	0.000	0.080	0.048	0.331	0.064
Exaggerated startle	55	0.166	0.000	0.000	0.146	0.080	0.422	0.060

Note. Values in bold indicate that individuals in this class had a high probability of reporting this symptom ( $\geq 0.5$ ). PG = prolonged grief. PTS = posttraumatic stress.

Loglikelihood value, Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), and Sample-Size Adjusted Bayesian Information Criterion (SS-BIC) with lower values indicating better model fit. The BIC is sometimes regarded as the main statistical index in model selection because it balances model-fit with parsimony, with decreases of 10 points or more reflecting improved fit (Raftery, 1995). We also considered entropy, which has values between 0 and 1, with higher values indicating better model fit (Celeux and Soromenho, 1996). With respect to non-statistical criteria, parsimony and interpretability of the latent classes were considered; that is, solutions including classes with larger sample sizes reflecting theoretically meaningful symptom patterns were preferred over solutions that included classes with small samples and that reflected symptom patterns adequately captured by solutions with lower numbers of classes.

We used ANOVAs to examine if children assigned to the classes differed in terms of their scores on self-rated prolonged grief (IPG), posttraumatic stress (CPSS), functional impairment (CPSS), and depression (CDI), and parent-rated internalizing, externalizing, and total problem behaviour (CBCL). We used chi-square tests and ANOVAs to examine differences in sociodemographic and loss-related variables between different classes.

### 3. Results

#### 3.1. Latent class analysis

Table 3 shows fit indices of the one to four class solutions. Based on fit indices and interpretability of the classes, 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. The four class solution had marginally lower Loglikelihood, SSBIC, and AIC indices, but yielded a higher BIC than the three class

solution. Moreover, upon inspection, the general patterns represented by the four classes were adequately captured by the symptom profiles of the three class solution. That is, the four class-solution encompassed one class characterized by high probabilities of endorsing most PGD symptoms, one class with high probabilities of endorsing most PGD and PTSD symptoms, and two not clearly distinguishable classes with low probabilities of endorsing almost all PGD and PTSD symptoms. Thus, the four class-solution largely resembled the three-class solution. The three class solution was thus selected as the best fitting, most parsimonious, and meaningful solution.

Table 2 shows symptom prevalence rates and conditional probabilities of symptoms in the three class solution, representing the percentage of participants in each class exhibiting each of the PGD and bereavement-related PTSD symptoms. In keeping with prior research (Hebenstreit et al., 2014), we considered values of  $\geq 0.5$  as representing high symptom probability, values between 0.3 and 0.5 as representing low probability, and values of  $< 0.3$  as representing very low probability.

Each of the three classes contained over 25% of all participants. Specifically, Class 1, coined the Resilient class, included 38.6% of the participants with very low probabilities of endorsing each of the PTSD

**Table 3**  
Goodness-of-fit statistics for 1–4 class solutions.

Model tested	Loglikelihood	BIC	SS-BIC	AIC	Entropy
1 class	– 4905.773	9968.284	9882.639	9865.545	
2 classes	– 4216.733	8752.747	8578.285	8543.465	0.911
3 classes	– 4108.572	8698.971	8435.691	8383.145	0.837
4 classes	– 4058.644	8761.659	8409.562	8339.289	0.842

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



symptoms, and low probabilities of endorsing most of the PGD symptoms, except “yearning for the deceased” and “difficulties accepting the loss”. Class 2, referred to as the PGD class, included 35.2% of the participants. They evidenced high probabilities of endorsing all PGD-symptoms, except “difficulty trusting others”, “bitterness or anger”, and “numbness”, and very low probabilities of endorsing almost all of the PTSD symptoms. Class 3—referred to as the combined PGD and PTSD class—included 26.2% of the participants. Participants in this class reported high probabilities of endorsing all PGD symptoms and seven PTSD symptoms (i.e., intrusive thoughts, emotional reactivity, physical reactivity, avoiding thoughts, disturbed sleep, irritability/anger, and difficulties concentrating).

3.2. Association of class membership with concurrent functioning and problems

Table 4 shows mean scores for the total sample and the three classes on the measures tapping self-rated prolonged grief (IPG), posttraumatic stress (CPSS), functional impairment (CPSS), and depression (CDI), as well as parent-rated internalizing, externalizing, and total problem behaviour (CBCL). Results from ANOVAs revealed significant between class differences on all indices. Pairwise comparisons indicated that scores on self-rated symptoms of PGD, PTSD, depression, and impairment were lowest in the Resilient class, intermediate in the PGD class, and highest in the combined PGD/PTSD class (*p*-values for pairwise comparisons were all *p* < 0.001). Parent-rated internalizing was significantly higher in the combined class compared to the Resilient-class and the PGD-class (*ps* < 0.01) but did not differ between these latter two classes (*p* = 0.44). Parent-rated externalizing only differed significantly between the combined class and the Resilient-class (*p* < 0.01). Overall problem behaviour was significantly higher in the combined class compared to the Resilient-class and the PGD-class (*ps* < 0.05) but did not differ between these latter two classes (*p* = 0.23).

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 ANOVAs (Table 1). No significant between class differences were found.

4. Discussion

To our knowledge, this is the first study examining patterns in symptoms of PGD and bereavement-related PTSD in children confronted with the death of a loved one. Using LCA, three subgroups were identified: a Resilient class, a predominantly PGD class, and a combined PGD/PTSD class. The Resilient class was characterized by low probabilities of endorsing all PTSD and most of the PGD symptoms. The

predominantly PGD class was characterized by high probabilities of endorsement of all but three PGD symptoms and none of the PTSD symptoms. Children in the combined class evidenced high probabilities of endorsing all PGD symptoms and seven bereavement-related PTSD symptoms.

The probabilities that symptoms “yearning for the deceased” and “difficulties accepting the loss” were endorsed was high in all three groups. This indicates that these two symptoms do not adequately distinguish between children suffering from pervasive PGD and children with less distress. Although these symptoms do not seem indicative of disturbance the way they are formulated in the IPG, it is possible that more extreme manifestations of yearning (in the form of, e.g., pervasive preoccupation with thoughts about the lost person and overwhelming pain when elaborating on the irreversibility of the loss) and non-acceptance (in the form of e.g., persistent proximity seeking behaviours or denial of the death) do delineate more disturbed from resilient classes.

The fact that we found one class with high probabilities of endorsing PGD symptoms (and low probabilities of endorsing PTSD symptoms) adds to prior evidence that, in a minority of children, disturbed grief manifests itself in distressing grief reactions that are distinct from PTSD (Dillen et al., 2009; Spuij et al., 2012b). Our analyses did not reveal classes with increasing probabilities of endorsing PGD and bereavement-related PTSD (i.e. classes with low, moderate, and high probabilities of endorsing both the PGD items and the bereavement-related PTSD items). This accords with prior LCA research among bereaved adults. Specifically, Nickerson et al. (2014) studied symptom profiles of PGD and PTSD in adult refugees following traumatic loss. Their LCA revealed four classes including a resilient, predominantly PGD, predominantly PTSD, and a combined PTSD/PGD class. In a similar vein, Boelen et al. (2016) used LCA to study profiles of PGD and depression among adults confronted with unnatural/violent loss. Their analyses identified a resilient, a predominantly PGD, and a combined PGD plus depression class. The current study findings are similar to these observation among adults, providing preliminary evidence that, in children and adults exposed to loss, subgroups exist that differ in terms of the nature of particular symptoms (e.g., some primarily experiencing PGD, others mainly plagued by concurrent PGD plus posttraumatic stress and/or depression) rather than by the graded intensity of a general post-loss response (also see Djelantik et al., 2017; Lenferink et al., 2017).

Class membership was significantly associated with indices of psychopathology and impairments in functioning. Specifically, children's self-rated levels of PGD, bereavement-related PTSD, depression, and functional impairment were lowest in the Resilient class, significantly higher in the PGD class, and highest in the combined PGD/PTSD class. This suggests that subgroups of bereaved children that are more distressed in terms of grief and traumatic stress symptoms, experience distress and disability in different domains. This accords with prior evidence that increased grief is associated with elevated depression and

Table 4  
Class means on indices of psychopathology and functioning.

	Total sample (N = 332)	Class 1 (n = 128, 38.6%) Resilient	Class 2 (n = 117, 35.2%) PG	Class 3 (n = 87, 26.2%) Combined PG and PTS	Comparisons between classes (ANOVAs)	Post-hoc pairwise comparisons
Prolonged Grief (IPG)	50.57 (11.84)	40.42 (6.09)	51.43 (6.90)	64.35 (8.62)	<i>F</i> (2, 331) = 294.61*	1 < 2 < 3
PTS (CPSS)	13.75 (9.94)	5.14 (3.48)	13.29 (4.87)	27.05 (6.36)	<i>F</i> (2, 331) = 526.58*	1 < 2 < 3
Impairment in functioning (CPSS)	1.84 (1.74)	0.70 (1.22)	2.04 (1.60)	3.25 (1.44)	<i>F</i> (2, 330) = 84.39*	1 < 2 < 3
Depression (CDI)	10.78 (7.17)	6.42 (4.22)	10.38 (5.80)	17.75 (6.95)	<i>F</i> (2, 330) = 106.30*	1 < 2 < 3
Internalizing Problems (CBCL)	12.85 (9.29)	10.74 (8.02)	12.18 (9.43)	16.83 (9.70)	<i>F</i> (2, 315) = 11.79*	1 = 2 < 3
Externalizing Problems (CBCL)	9.79 (8.61)	8.44 (7.67)	9.53 (8.52)	12.13 (9.61)	<i>F</i> (2, 315) = 4.71*	1 = 2; 2 = 3; 1 < 3
Total Problems (CBCL)	39.59 (25.55)	33.81 (23.65)	39.22 (26.62)	48.58 (24.51)	<i>F</i> (2, 315) = 8.67*	1 = 2 < 3

Note. CDI = Children's Depression Inventory. CBCL = Child Behaviour Checklist. CPSS = Child Posttraumatic Stress-Disorder Symptom Scale. IPG = Inventory of Prolonged Grief. PG = prolonged grief. PTS = posttraumatic stress.

\* *p* < 0.001.

functional impairment (Melhem et al., 2011). Parent-rated internalizing, externalizing, and overall problem behaviour were also highest in the combined PGD/PTSD class, but did not differ between the Resilient class and the PGD class. This might be taken to indicate that the experience of children of different levels of distress and disability across the three classes (evidenced by differences in levels of grief, posttraumatic stress, and depression between classes) is not paralleled by parent's/caretaker's perception of divergent levels of distress in these classes. Notably, this is reminiscent of prior evidence suggesting that parents are not always well aware of bereavement-related distress of their children (Spuij et al., 2012a). Alternatively, taking into account prior findings of no significant linkage between PGD and CBCL scores (Melhem et al., 2007), it is possible that elevated PGD is not strongly associated with parent rated problem behaviour.

We found class-membership to be unrelated to all sociodemographic variables and loss-related variables that we gathered information about. Although this may seem unexpected, there is little unequivocal evidence from prior research that these variables are associated with different levels of problematic grief. For instance, Melhem et al. (2004) found female gender to be associated with elevated childhood PGD, whereas Spuij et al. (2012a) found no gender differences. As another example, violent deaths were associated with elevated PGD in a study conducted by Dillen et al. (2009), whereas Kaplow et al. (2014) found anticipated deaths to be more strongly associated with disturbed grief. It is possible that the clinical course of disturbed grief in children is more strongly influenced by other, child-intrinsic factors, including negative appraisals and coping behaviours, than by socio-environmental factors. Literature on childhood PTSD indeed suggests that childhood adjustment to stressful events is more strongly determined by intrapersonal and post-event variables than by the nature of the events itself (Trickey et al., 2012).

There are a number of limitations to consider when interpreting the current findings. First, it is possible that the current sample was too small to detect meaningful differences in sociodemographic and loss-related variables between classes. More research, using larger samples, is needed to further explore risk factors for poor bereavement outcome in children. Moreover, it is possible that other less common, yet meaningful subgroups would emerge with larger samples. Secondly and relatedly, our analyses relied on children seeking some form of help or support following their loss. Thus, the generalizability of the current findings to other clinical and non-clinical groups needs further study. Thirdly, generalization is limited by the fact that the number and nature of children who declined participation was not systematically registered. Fourthly, as we relied on cross-sectional data, future studies are also needed to evaluate the stability of class membership over time. Fifthly, we did not use formal interview-based assessment to diagnose PGD and PTSD. Thus an additional issue warranting further scrutiny is the prevalence of (comorbid) PGD and bereavement-related PTSD diagnoses in bereaved children. A further limitation is that we did not examine traumatic events other than loss (which can increase risk for PTSD); therefore, we were unable to examine if exposure to other events explained differences between classes. Finally, although the wording of grief items tapped with the IPG was age-appropriate (Spuij et al., 2012a), the measure drew from an adult measure of grief (the ICG-R, Prigerson and Jacobs, 2001) and possibly omitted reactions not seen in adults. This underscores the need for further research using child- or adolescent-specific grief measures.

Notwithstanding these limitations, the present findings add knowledge about symptom patterns of PGD and bereavement-related PTSD in bereaved children. This study assists in building an empirical base that is needed to refine options for assessment and effective interventions—a base that is urgently needed (Claycomb et al., 2016; Kaplow et al., 2012). Our findings are broadly consistent with theorizing that grief in children is multidimensional, with some children showing elevations in one domain (e.g., typical grief symptoms including yearning and difficulties accepting the death) and other

children in more domains (e.g., similar grief symptoms plus symptoms of bereavement-related PTSD, such as intrusive thoughts of the circumstances of the death; Kaplow et al., 2012). If future (preferably longitudinal) studies confirm the multidimensional nature of childhood grief, this may bear theoretical and clinical implications. Broadly, that would underscore the need to further knowledge about risk and protective factors involved in the maintenance of separation distress, traumatic distress, and their interplay. That knowledge could, in turn, help to improve treatment options. For instance, in children mainly suffering separation distress, interventions should possibly best focus on elaborating and integrating the reality of the loss. In children with traumatic distress, these interventions should possibly best be combined with treatment techniques addressing distress associated with the circumstances of the loss (e.g., exposure to trauma memories). As noted by others (e.g. Claycomb et al., 2016), advancing our understanding of the phenomenology and underlying mechanisms of disturbed grief in children is urgently needed—particularly considering the emerging position of disturbed grief in psychiatric nomenclatures.

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