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Is There Traumatic Prolonged Grief? Structure of Prolonged Grief and Its Relationship With Depression and Posttraumatic Stress Following Traumatic and Non-Traumatic Deaths

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Abstract

Background: Some researchers have proposed the constructs of traumatic grief or traumatic prolonged grief to refer to prolonged grief following a death under traumatic circumstances, and to conceptualize it as distinct from prolonged grief following a natural death. Two studies were conducted to examine the validity of the construct of traumatic prolonged grief by analyzing: (1) whether the internal structure of prolonged grief symptoms differs between individuals bereaved by traumatic versus non-traumatic deaths, and (2) whether the relationships among prolonged grief, posttraumatic stress, and depression symptoms vary as a function of the type of death.

Method: Study 1 examined the factorial structure of the Inventory of Complicated Grief (ICG) in a sample of 269 adults who had lost a family member due to illness or old age and compared it with that previously obtained in a sample of 211 relatives of individuals who had died in terrorist attacks, and measurement invariance across samples was sequentially examined using procedures suited for ordinal data. Study 2 examined the factorial relationships among prolonged grief (ICG), posttraumatic stress (PTSD Checklist-Specific (PCL-S), or PTSD Checklist for DSM-5 (PCL-5)), and depression (Beck Depression Inventory-II (BDI-II)) symptoms in both samples.

Results: Study 1 revealed a unifactorial structure of the ICG in individuals bereaved by non-traumatic deaths, consistent with that previously identified in individuals bereaved by terrorist attack, while also demonstrating full metric invariance and near-full scalar invariance (17 of 19 items) across bereavement types. Study 2 showed that, in both samples, prolonged grief symptoms formed a factor distinct from posttraumatic stress and depression symptoms, with equivalent factorial solutions (three factors).

Conclusions: The findings do not support the empirical validity of traumatic prolonged grief as a distinct construct from prolonged grief.

Keywords

grief; prolonged grief; traumatic death; natural death; traumatic grief; posttraumatic stress

Introduction

Grief is a natural response to the death of a loved one, characterized by emotional, cognitive, behavioral, and physiological reactions, and is a virtually universal human experience, although its manifestations vary substantially across individuals and cultures [1,2]. Some of these variations reach a clinically significant level of intensity, frequency, or duration that causes impairment in social, occupational, or other important areas of functioning, cannot be attributed to culturally accepted responses to loss, and constitute what psychopathology refers to as prolonged grief—a term adopted here for consistency with its inclusion in the International Classification of Diseases, 11th Revision (ICD-11) [3] and, subsequently, in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Re-

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vision (DSM-5-TR) [4]. The incorporation of prolonged grief disorder into both classification systems has substantially boosted scientific output on this phenomenon [5].

Despite this progress, important questions remain unresolved. One concerns whether the prolonged grief that follows a death occurring under violent, sudden, and unexpected circumstances—such as a terrorist attack, a natural disaster, a suicide, or a criminal act—is comparable to that which follows a "natural" death (due to old age or illness), or whether, on the contrary, the two constitute distinct constructs: prolonged grief and traumatic prolonged grief. The DSM-5 hinted at this distinction by proposing a "with traumatic bereavement" specifier for persistent complex bereavement disorder when the death resulted from homicide or suicide, accompanied by persistent distressing preoccupations regarding the traumatic nature of the death [6].

It should be noted that the term traumatic grief has been used inconsistently in the literature: it was initially applied to clinically significant grief following any type of death [7,8], but was subsequently reserved for deaths caused by traumatic events [9,10]. In the present paper, the term traumatic prolonged grief is used specifically to refer to prolonged grief following a traumatic death.

In cases of traumatic bereavement, one might expect prolonged grief symptoms to more closely resemble those of posttraumatic stress disorder (PTSD), to co-occur with PTSD symptoms, or for the grief symptoms most similar to PTSD to be the most prominent (e.g., avoidance of reminders of the deceased, disbelief, emotional numbness, anger or bitterness about the death). Any of these possibilities could yield a psychopathological condition that differs from prolonged grief following non-traumatic bereavement.

The two studies reported here examined the possible existence of traumatic prolonged grief by analyzing: (a) whether the factor structure of prolonged grief symptoms in individuals bereaved by traumatic deaths—specifically, family members of victims of terrorist attacks—differs from that observed in individuals bereaved by non-traumatic deaths (Study 1); and (b) whether the relationships among prolonged grief, posttraumatic stress, and depression symptoms differ as a function of the type of death (traumatic vs. non-traumatic) (Study 2). Were traumatic prolonged grief to be confirmed as a distinct construct, this would carry significant clinical implications: treatment for this condition should place greater—or at least equal—emphasis on the trauma component and not only on the cognitive restructuring of the meaning of the loss [11,12].

Study 1

Soriano *et al*. [13] examined the factor structure of the Inventory of Complicated Grief (ICG) [14] in a Spanish sample of family members bereaved through terrorist attacks and found a one-factor solution. This contrasted with the multifactorial solutions obtained in Spanish samples bereaved through non-traumatic losses: three factors [15] and four factors [16]. This discrepancy could be seen as supporting the distinction between prolonged grief and traumatic prolonged grief. However, the studies involving non-traumatic samples employed outdated factor-analytic procedures—principal components analysis and Kaiser's eigenvalue-greater-than-one criterion—which tend to produce solutions with an inflated number of factors [17,18]. The goal of Study 1 was to replicate the factor structure of the ICG in a Spanish sample bereaved by non-traumatic deaths, following the up-to-date factor-analytic procedures of Soriano *et al*. [13], and to compare the resulting solution with theirs. If both factor structures aligned, measurement invariance across samples would be sequentially examined using procedures suited for ordinal data: configural invariance evaluates whether both groups share the same factor structure (i.e., identical number of factors and item-factor mapping), metric invariance tests whether the items exhibit equal factor loadings across groups indicating that the latent construct is measured on the same scale, and scalar invariance tests for equal item thresholds, allowing unbiased latent mean comparisons [19].

Methods

Participants

Two bereavement samples participated. The first was a non-traumatic bereavement sample recruited using a snowball sampling strategy. Psychology students at the Complutense University of Madrid each invited six family members or friends who had experienced the death of a relative to participate in a study on grief. To ensure sample heterogeneity, these six individuals were required to represent three broad age groups and both sexes. Participant recruitment and data collection for this sample began in November 2019 and ended in May 2020. A total of 390 participants completed a battery of questionnaires, including an ad hoc questionnaire assessing bereavement characteristics, in which they were asked to indicate the cause of their relative's death from a list of options. After excluding 26 participants with incomplete questionnaire data, we selected those who reported age or illness as the cause of death (n = 269) and excluded those who reported potentially traumatic causes, including accident, sudden death,

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suicide, and physical violence (n = 95). Therefore, the final sample comprised 269 bereaved community adults (62.8% women) with a mean age of 49.07 years (standard deviation (*SD*) = 20.17, range = 19–89 years). The death had occurred, on average, 13.15 years prior to assessment (*SD* = 13.34). Causes of death were illness (79.9%) and old age (20.1%).

The second comprised 211 adult family members of individuals killed in terrorist attacks in Spain, drawn from the study by Soriano *et al*. [13], which, in turn, formed part of a larger research project on the long-term psychological consequences of terrorism that included all victims of terrorism who were members of the Association of Victims of Terrorism (Asociación Víctimas del Terrorismo, AVT). The present data were drawn from the first 759 AVT members contacted by telephone who met the eligibility criterion of being a relative of a person killed in a terrorist attack. Of these, 421 completed a telephone-administered psychological interview and were subsequently invited to undergo a more comprehensive in-person assessment. Of those invited, 246 completed this second face-to-face evaluation. However, because not all participants completed the ICG, the final sample for the present study comprised 211 participants. Participant recruitment and data collection for this sample began in 2012 and ended in 2017. Participants in this traumatic bereavement sample had a mean age of 52.48 years (*SD* = 14.43, range = 19–87 years), and 67.3% were women. The terrorist attack had occurred, on average, 26.35 years before the assessment (*SD* = 9.04).

Sociodemographic, bereavement, and clinical characteristics of both bereavement samples are presented in Table 1.

Variables and Instruments

Prolonged grief symptoms. These were assessed with the ICG in its Spanish adaptation [15]. The ICG consists of 19 items about thoughts and behaviors associated with prolonged grief, rated on five-point Likert scales (0 = "Never"; 4 = "Always"), yielding a total score ranging from 0 to 76. The ICG demonstrates good reliability and validity in both its original version (Cronbach's alpha = 0.94; test-retest reliability = 0.80 [14]) and its Spanish adaptation (Cronbach's alpha = 0.88 [15]). In the present samples, Cronbach's alpha and McDonald's omega were both 0.92 (non-traumatic bereavement sample) and 0.93 (traumatic bereavement sample [13]).

Sociodemographic and bereavement-related characteristics. Participants completed an ad hoc questionnaire assessing basic sociodemographic characteristics (e.g., sex, age, educational level, marital status) and bereavement-related characteristics (e.g., sex and age of the deceased, cause of death, relationship to the deceased, and time since death).

Posttraumatic stress symptoms. The symptoms were assessed with the Spanish adaptation of the PTSD Checklist-Specific (PCL-S) [20,21], a 17-item DSM-IV-based measure rated on 5-point Likert scales (1–5), administered to the traumatic bereavement sample; and the Spanish adaptation of the PTSD Checklist for DSM-5 (PCL-5) [22,23], a 20-item DSM-5-based measure rated on 5-point Likert scales (0–4), administered to the non-traumatic bereavement sample. Both instruments demonstrate good psychometric properties in their original and Spanish versions [20,23–26], share 16 items assessing the same PTSD symptoms, and show a correlation of 0.85 between total scores [27]. Cronbach's alpha was 0.93 in both samples.

Depression symptoms. These symptoms were assessed in both samples with the Beck Depression Inventory-II (BDI-II) [28], in its Spanish adaptation [29]. The BDI-II consists of 21 items rated on 0–3 scales, yielding total scores ranging from 0 to 63. It demonstrates good psychometric properties (Cronbach's alpha = 0.91) [30]. In the present study, Cronbach's alpha was 0.94 in the traumatic bereavement sample and 0.90 in the non-traumatic bereavement sample.

Procedure

After providing written informed consent, both participant samples completed a battery of questionnaires. In the non-traumatic bereavement sample, the questionnaire battery was administered individually by the student who had recruited them, and measures were administered in the following order: BDI-II, PCL-5, and ICG, with the PCL-5 completed in reference to the most traumatic or stressful event identified through an ad hoc life events checklist based on the LEC-5 [22]. All participants in the non-traumatic bereavement identified the death of their relative as the traumatic or stressful index event when completing the PCL-5. Students were trained and supervised through a seminar on complicated grief led by three authors of the present study, all psychologists specializing in the assessment and treatment of emotional disorders associated with trauma and bereavement. In the traumatic bereavement sample, psychologists with specialized training in the psychological care of terrorism victims administered the questionnaire battery, and measures were administered in the following order: BDI-II, PCL-S, and ICG, with the PCL-

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Table 1. Sociodemographic, bereavement, and clinical characteristics of the samples of adults bereaved by non-traumatic deaths (N = 269) and traumatic deaths (N = 211).

Characteristic	Non-traumatic deaths	Traumatic deaths
Sex [% of women (*n*)]	62.8 (169)	67.3 (142)
Age [% (*n*)]		
19–29 years	26.4 (71)	7.1 (15)
30–49 years	16.0 (43)	34.1 (72)
50 years or older	57.6 (155)	58.8 (124)
Education [% (*n*)]		
No formal education	4.1 (11)	2.8 (6)
Primary education	23.8 (64)	23.2 (49)
Secondary (high school or vocational education)	45.0 (121)	39.8 (84)
University or graduate education	27.1 (73)	34.1 (72)
Marital status [% (*n*)]		
Married or cohabiting	50.1 (135)	48.8 (103)
Single	30.9 (83)	16.1 (34)
Separated or divorced	9.7 (26)	4.7 (10)
Widowed	9.3 (25)	30.3 (64)
Cause of death [% (*n*)]		
Illness	79.9 (215)	0.0 (0)
Old age	20.1 (54)	0.0 (0)
Terrorist attack	0.0 (0)	100 (211)
Relationship of the deceased to the participant [% (*n*)]		
Parent	39.8 (107)	41.7 (88)
Grandparent	31.2 (84)	1.4 (3)
Sibling	6.7 (18)	13.3 (28)
Partner/Spouse	6.7 (18)	31.3 (66)
Child	2.2 (6)	3.8 (8)
Other	13.4 (36)	8.5 (18)
Time elapsed since death [% (*n*)]		
Less than 1 year	5.2 (14)	0.0 (0)
1–2 years	17.5 (47)	0.0 (0)
3–5 years	17.8 (48)	0.0 (0)
6–10 years	14.1 (38)	10.4 (22)
11–20 years	21.9 (59)	18.5 (39)
More than 20 years	23.4 (63)	71.1 (150)
Prolonged grief symptoms (ICG) [mean (*SD*)]	15.29 (13.64)	23.46 (16.31)
Depressive symptoms (BDI-II) [mean (*SD*)]	11.79 (8.82)	12.18 (12.02)
Posttraumatic stress symptoms (PCL-5) [mean (*SD*)]	17.46 (15.22)	—
Posttraumatic stress symptoms (PCL-S) [mean (*SD*)]	—	32.0 (14.42)
Probable prolonged grief (ICG > 25) [% (*n*)]	19.3 (52)	42.7 (90)
Probable depression (BDI-II > 19) [% (*n*)]	18.2 (49)	24.6 (52)
Probable PTSD (PCL-5 > 31 or PCL-S > 44) [% (*n*)]	19.0 (51)	21.3 (45)

Note. BDI-II, Beck Depression Inventory-II; ICG, Inventory of Complicated Grief; PCL-S, PTSD Checklist-Specific; PCL-5, PTSD Checklist for DSM-5.

S completed in reference to the terrorist attack in which the participant's family member had died (the procedure is described in detail in Soriano *et al*. [13]).

Statistical Analyses

Following the factor-analytic procedures of Soriano *et al*. [13], factor analyses in the non-traumatic bereavement sample were conducted using FACTOR v. 12.06.07, Rovira

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i Virgili University (Tarragona, Spain) [31] on the matrix of polychoric correlations among items, given that most items (17 of 19; 89.5%) showed kurtosis or skewness values outside the normal range (−1/+1) and Mardia's test revealed significant multivariate kurtosis ($p < 0.05$). Sampling adequacy was evaluated using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) index. The number of factors was determined through five procedures: Cattell's scree test, the Hull method, Velicer's MAP test, classical Horn parallel analysis, and Timmerman and Lorenzo-Seva's optimized parallel analysis [32]. In cases where the procedures suggested different numbers of factors, the decision was based on the number or numbers most consistently recommended across procedures and on the psychological interpretability of the resulting solutions. Extraction was performed using the robust unweighted least squares (RULS) method. The following fit indices were computed (with conventional adequacy criteria): χ^2/df ($\leq$5), GFI ($\geq$0.95), CFI ($\geq$0.95), NNFI ($\geq$0.95), RMSEA ($\leq$0.08), and WRMR ($<$0.90). For the one-factor solution, three additional unidimensionality indices were also computed: the unidimensional congruence index (UniCo; $>$0.95), percentage of explained common variance (ECV; $>$0.85), and mean of item residual absolute loadings (MIREAL; $<$0.30) [33]. Multifactor solutions were rotated using the oblique promin procedure; for the psychological interpretation, the content of items that loaded $\geq$0.35 on one factor (for sample sizes of at least 250 participants; [34]) and showed lower loadings on the remaining factors was taken into account.

If factor structures in the non-traumatic and traumatic bereavement samples aligned, measurement invariance across bereavement samples was tested using a sequential configural-metric-scalar approach for ordinal indicators [35], estimated in R version 4.5.0, R Foundation for Statistical Computing (Vienna, Austria) with the *lavaan* package [36] using the diagonally weighted least squares (DWLS) estimator with robust standard errors and a mean- and variance-adjusted (WLSMV) test statistic. Model fit was evaluated using standard fit indices (CFI, RMSEA, SRMR), applying the conventional benchmarks of CFI $\geq$ 0.95, RMSEA $\leq$ 0.08, and SRMR $\leq$ 0.10 as indicative of adequate fit [37]. Nested models were compared using the Satorra-Bentler scaled chi-square difference test [38] alongside changes in CFI, RMSEA, and SRMR, following Chen's criteria for noninvariance (for testing loading invariance, changes of $\geq$–0.010 in CFI, of $\geq$ 0.015 in RMSEA, and of $\geq$ 0.030 in SRMR would indicate noninvariance; for testing threshold invariance, changes of $\geq$ –0.010 in CFI, of $\geq$ 0.015 in RMSEA, and of $\geq$ 0.010 in SRMR would indicate noninvariance) [39]. Item-level score tests [40] were used to identify specific non-invariant parameters and to specify a partial invariance model where warranted.

Results

Bartlett's test (χ^2 = 3,003.0, $p < 0.00001$) and the KMO index (0.825) indicated that the polychoric correlation matrix in the non-traumatic bereavement sample was suitable for factor analysis. Four of the five factor-retention procedures converged on a one-factor solution; only Horn's classical parallel analysis suggested two factors (Table 2). One- and two-factor solutions were therefore extracted and compared. Both solutions showed acceptable or good fit indices (Table 3), with the two-factor solution yielding marginally better values. For the one-factor solution, the additional unidimensionality indices—UniCo = 0.958, ECV = 0.873, MIREAL = 0.227—confirmed satisfactory fit to a unidimensional structure.

In the two-factor solution (Table 4), the second factor (Factor 1) was primarily defined by two items (factor loadings $\geq$0.35 on Factor 1 and factor loadings $<$0.35 on Factor 2): auditory experiences (Item 14: "I hear the voice of the person who died speak to me") and visual experiences (Item 15: "I see the person who died stand before me"). These two items had very low mean scores and low endorsement rates in the sample (**Supplementary Tables 1 and 2**). This second factor, primarily defined by only two items, appeared to reflect both a substantive content factor and a technical difficulty factor—that is, an artifact of similarly shaped, highly skewed distributions [17]—and cannot be considered reliable. Furthermore, all items showed high loadings ($\geq$0.50) on the single factor—14 of them with loadings $>$0.60 (Table 4)—and the correlation between the two factors in the two-factor solution was positive and large (0.49), further supporting the adequacy of the one-factor solution.

In summary, the factor structure of the ICG in the sample of individuals bereaved through non-traumatic deaths is unidimensional, replicating the solution obtained by Soriano *et al*. [13] with individuals bereaved through terrorist attacks.

Therefore, a single-factor model of complicated grief, with a single latent factor measured by the 19 items, was specified and tested for measurement invariance across the two bereavement samples. The configural model showed acceptable fit based on the CFI and SRMR, although the RMSEA slightly exceeded the recommended cutoff (CFI = 0.953, RMSEA = 0.085 [0.078, 0.092], SRMR = 0.085). Metric invariance was then imposed, and the scaled chi-square difference test (Satorra-Bentler correction) was non-

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Table 2. Recommended number of factors to extract from the polychoric correlation matrix of ICG items in the sample of adults bereaved by non-traumatic deaths.

Procedure	No. of factors
Cattell's scree test (Supplementary Fig. 1)	1
Timmerman & Lorenzo-Seva's optimized parallel analysis	1
Horn's classical parallel analysis	2
Hull method	1
Velicer's MAP test	1

Note. ICG, Inventory of Complicated Grief.

Table 3. Fit indices for the ICG factor solutions in the sample of adults bereaved by non-traumatic deaths.

Index	One-factor solution	Two-factor solution
Variance explained (%)	54.26	62.71
χ^2/degrees of freedom	2.15*	1.32*
GFI	0.978*	0.988*
CFI	0.992*	0.994*
NNFI	0.991*	0.992*
RMSEA	0.049*	0.046*
WRMR	0.065*	0.048*
Fitting of single-factor solutions		
UniCo	0.958*	—
ECV	0.873*	—
MIREAL	0.227*	—

Note. Factor analysis performed using the robust unweighted least squares method. *Acceptable or good fit: χ^2/df < 5; GFI, CFI, and NNFI > 0.95; RMSEA ≤ 0.08; WRMR < 0.90; UniCo > 0.95; ECV > 0.85; MIREAL < 0.30. ICG, Inventory of Complicated Grief.

significant ($\Delta\chi^2 = 27.64$, Δdf = 18, $p = 0.068$), and the fit-index change criteria supported the same conclusion (ΔCFI = +0.015, ΔRMSEA = −0.017, ΔSRMR = +0.007, all within the noninvariance thresholds proposed by Chen [39]). Factor loadings were therefore considered invariant across bereavement samples.

When thresholds were additionally constrained to test scalar invariance, the chi-square difference test became uninterpretable: the Satorra scaled-and-shifted statistic [41] yielded a negative value ($\Delta\chi^2 = -219$, Δdf = 38), a theoretically impossible result that reflects a documented limitation of this correction when scaling factors from two models with a large number of simultaneous constraints are combined, rather than an actual improvement in fit [42]. This test was therefore discarded as a decision criterion at this step, and two complementary strategies were used instead: fit-index change criteria and a parameter-level inspection of the individual equality constraints.

Fit-index changes (ΔCFI = −0.013, ΔRMSEA = +0.008, ΔSRMR = −0.007) showed a weak and non-unanimous signal of possible scalar non-invariance (only ΔCFI exceeded the −0.010 criterion). To determine whether this signal originated from specific items, a univariate score test [40] (implemented via lavTestScore in lavaan) was applied to each loading and threshold equality constraint; this test identifies which constraints generate the greatest tension without relying on the unstable global difference statistic. Two items (item 3: "I feel I cannot accept the death of the person who died", and item 16: "I feel that it is unfair that I should live when this person died.") showed simultaneous tension in both their factor loading and several thresholds. Based on this evidence, a partial scalar invariance model was specified, freeing the factor loading and the significant thresholds of item 3 and item 16 while keeping all remaining parameters constrained to equality, following the sequential, evidence-driven approach to partial invariance recommended by Yoon and Millsap [43]. Rerunning the score test on this new model showed only two remaining constraints with $p < 0.05$ (item-11 threshold 3, $p = 0.037$; item-17 threshold 1, $p = 0.048$), a number consistent with chance given the number of comparisons performed (88) and interpreted as the absence of remaining structural tension. Fit-index changes relative to the metric model (ΔCFI = −0.012, ΔRMSEA = +0.008, ΔSRMR

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Table 4. Factor loadings matrix for the ICG factor solutions in a sample of adults bereaved by non-traumatic deaths.

Item	One-factor solution	Two-factor solution	
		Factor 1	Factor 2
1. Dysfunctional thoughts about the deceased	0.814		0.730
2. Disturbing memories of the deceased	0.777		0.664
3. Non-acceptance of the death	0.865		0.849
4. Yearning for the deceased	0.592	–0.429	0.831
5. Attraction to reminders of the deceased	0.500		0.662
6. Feeling angry about the death	0.750		0.908
7. Difficulty believing the death occurred	0.790		0.895
8. Feeling stunned by the death	0.873		0.872
9. Difficulty trusting people since the death	0.696		0.593
10. Feeling detached from people since the death	0.740		0.597
11. Experiencing pain or symptoms similar to those of the deceased	0.566	0.396	0.361
12. Avoidance of memories of the deceased	0.620		0.474
13. Feeling that life is empty without the deceased	0.792		0.854
14. Hearing the voice of the deceased	0.518	0.369	0.327
15. Seeing the deceased	0.611	0.650	
16. Feeling that the death is unfair	0.794		0.774
17. Feeling bitter about the death	0.790		0.889
18. Envy of those who have not lost a loved one	0.571	–0.305	0.738

Note. Factor weights less than 0.30 are not displayed. The factor weight matrix for the two-factor solution is the matrix rotated by a promin oblique rotation. ICG, Inventory of Complicated Grief.

= −0.007) were nearly identical to those of the fully constrained scalar model, which was attributed to the limited sensitivity of global fit indices to changes in a small number of parameters within a large model.

Taken together, this process established full metric invariance and partial scalar invariance (17 of 19 items with invariant thresholds) between the traumatic and non-traumatic grief samples.

Discussion

Study 1 aimed to determine whether the internal structure of prolonged grief symptoms differs as a function of the type of death. The results reveal a one-factor solution for the ICG in Spanish individuals bereaved by non-traumatic deaths, replicating the solution found by Soriano *et al*. [13] in individuals bereaved by terrorist attacks. This convergence does not, in principle, support the existence of a structurally distinct traumatic prolonged grief construct.

The one-factor solution is also consistent with international studies involving samples bereaved through non-violent deaths: studies with bereaved Americans [14,44], and studies on the German [45], Italian [46], and Polish [47] adaptations of the ICG. The ICG multifactorial solutions previously reported in Spanish samples [15,16] and other international samples [44,48–50] are methodologically questionable given the widespread use of principal components analysis and Kaiser's criterion, both of which tend to extract an inflated number of factors [17,18,51].

The subsequent invariance analysis reinforced the conclusion that the same 19 items of the ICG appear to tap a single dimension regardless of the circumstances of the death. Configural invariance indicated that the same one-factor structure fit reasonably well in both samples, and metric invariance held in full: the 19 items showed equivalent factor loadings across groups, meaning that each symptom contributes to the latent grief factor with the same relative weight regardless of the circumstances of the death. This is arguably the strongest evidence bearing on the research question, since equal loadings indicate a structurally identical construct in both groups.

Scalar invariance, evaluated through fit-index changes and item-level score tests given the instability of the global difference test under WLSMV estimation, held for the large majority of items: 17 of the 19 thresholds were invariant across samples. Only two items, non-acceptance of the death (item 3) and perceived unfairness of surviving the deceased (item 16), showed differential functioning, indicating that, at a given level of the latent grief factor, these two items were endorsed somewhat more strongly in the traumatic sample than the model predicted from loading- and

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threshold-equivalence alone. This localized departure from full scalar invariance suggests that traumatic bereavement may disproportionately sharpen these two specific grief-related cognitions (perceived injustice and unacceptability of the loss) over and above the general elevation in symptom severity observed across the full item set.

Overall, these findings do not support the existence of a separate traumatic prolonged grief construct, at least at the level of symptom structure: the one-factor model that emerged in both samples, together with full metric and largely scalar invariance, indicates that the ICG measures the same latent construct in a directly comparable way across groups. Notably, despite this structural equivalence, traumatic bereavement was associated with significantly higher ICG total scores: mean = 23.46 vs. 15.29, $t(478) = 5.97$, $p < 0.0001$, Cohen's $d = 0.549$. Traumatic bereavement was also associated with a significantly higher proportion of participants above the clinical cutoff for prolonged grief (ICG total score > 25 [14]): 42.7% vs. 19.3%, $\chi^2 = 30.54$, $p < 0.0001$. Because metric and largely scalar invariance were established, this difference can be interpreted as a genuine difference in the level of the latent construct rather than a measurement artifact, indicating that traumatic bereavement is a substantial quantitative risk factor for clinically significant prolonged grief, even in the absence of a qualitatively distinct construct. Clinically, assessment of prolonged grief after traumatic death need not rely on a separate diagnostic category, although clinicians may reasonably anticipate a higher overall symptom burden in this population, with non-acceptance and unfairness-related cognitions potentially showing a disproportionate elevation relative to the rest of the symptom profile.

Future research should replicate these findings with instruments more closely aligned with the DSM-5-TR and ICD-11 definitions of prolonged grief disorder, such as the PG-13-R [52] or the TGI-SR+ [53]. Pending such replications, the present source of evidence does not support traumatic prolonged grief as a distinct construct, although other sources of evidence might, a question addressed in Study 2.

Study 2

Study 2 examined whether the relationships among prolonged grief, posttraumatic stress, and depression symptoms differ as a function of bereavement type. To this end, a joint factor analysis of measures of prolonged grief, posttraumatic stress, and depression was conducted in both bereaved samples (traumatic and non-traumatic) and the resulting factor solutions were compared. Divergent solutions would support the construct validity of traumatic prolonged grief; similar solutions would not.

Methods

Participants

The same two bereaved samples from Study 1 participated in Study 2, with the caveat that the non-traumatic bereavement sample included only those participants who had identified the death of their loved one as the traumatic or stressful index event when completing the posttraumatic stress symptom measure. Consequently, the non-traumatic bereavement sample in Study 2 comprised 169 bereaved individuals. Their mean age was 51.37 years (*SD* = 19.90; range: 19–88 years), and 64.5% were women. On average, the death had occurred 13.01 years prior to assessment (*SD* = 12.99). The causes of death were illness (81.7%) and old age (18.3%). Regarding the relationship between the participant and the deceased, 43.2% of the deceased were parents, 24.8% grandparents, 8.9% spouses or partners, 7.7% siblings, and 15.4% other relatives.

Variables and Instruments

Prolonged grief, posttraumatic stress, and depressive symptoms. These symptoms were assessed, respectively, with the ICG, PCL-S/PCL-5, and BDI-II described in Study 1.

Procedure

The procedure is described in Study 1.

Statistical Analyses

Joint factor analyses of the ICG, PCL-S/PCL-5, and BDI-II items were performed in each sample using the same software and procedures as in Study 1, but on Pearson correlation matrices. Although polychoric correlations were initially preferred, given that most items violated normality assumptions, the polychoric correlation matrix in the traumatic bereavement sample was not positive definite and available smoothing procedures destroyed 46.2% of the covariance. Following the recommendations of Ferrando and Lorenzo-Seva [31,54], Pearson correlations were therefore used as an approximation to the latent correlation matrix.

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Table 5. Recommended number of factors to extract from Pearson correlation matrices of ICG, BDI-II, and PCL-S/PCL-5 items in the samples of adults bereaved by traumatic and non-traumatic deaths.

Procedure	No. of factors	
	Traumatic deaths	Non-traumatic deaths
Cattell's scree test (Supplementary Fig. 2)	2 or 3	3 or 4
Timmerman & Lorenzo-Seva's optimized parallel analysis	2	4
Horn's classical parallel analysis	3	5
Hull method	1	1
Velicer's MAP test	3	3

Note. BDI-II, Beck Depression Inventory-II; ICG, Inventory of Complicated Grief; PCL-S, PTSD Checklist, specific version; PCL-5, PTSD Checklist for DSM-5.

Table 6. Fit indices for the factor solutions obtained from the joint analysis of ICG, BDI-II, and PCL-S/PCL-5 items in the samples of adults bereaved by traumatic and non-traumatic deaths.

Index	Traumatic deaths		Non-traumatic deaths	
	Two factors	Three factors	Three factors	Four factors
Variance explained (%)	45.06	48.78	41.96	46.07
χ^2/degrees of freedom	0.76*	0.61*	0.83*	0.67*
GFI	0.980*	0.984*	0.955*	0.965*
CFI	0.987*	0.988*	0.962*	0.974*
NNFI	0.986*	0.987*	0.958*	0.971*
RMSEA	0.047*	0.044*	0.057*	0.048*
WRMR	0.065*	0.056*	0.067*	0.059*

Note. Factor analysis performed using the robust unweighted least squares method. *Acceptable or good fit: χ^2/df < 5; GFI, CFI, and NNFI > 0.95; RMSEA ≤ 0.08; WRMR < 0.90. BDI-II, Beck Depression Inventory-II; ICG, Inventory of Complicated Grief; PCL-S, PTSD Checklist, specific version; PCL-5, PTSD Checklist for DSM-5.

Results

Relationships Among Prolonged Grief, Posttraumatic Stress, and Depression Symptoms in Individuals Bereaved by Traumatic Death

Bartlett's test ($\chi^2 = 2131.8, p < 0.0001$) and the KMO index (0.929) confirmed the adequacy of the correlation matrix. The five factor-retention procedures indicated predominantly two- or three-factor solutions (Table 5); both were therefore extracted and compared. Both solutions showed acceptable or good fit indices, with the three-factor solution yielding marginally better values (Table 6).

In the two-factor solution (**Supplementary Table 3**), all ICG items, except Item 11 ("I have pain in the same area of my body or have some of the same symptoms as the person who died"), showed factor loadings >0.35 on Factor 2, defining it as a prolonged grief factor. BDI-II items and most PCL-S items loaded substantively on Factor 1, constituting a combined depression-posttraumatic stress factor. Only two PCL-S items (Items 7 and 12) showed secondary loadings >0.30 on Factor 2, but these did not exceed 0.35.

In the three-factor solution (Table 7), 17 of the 19 ICG items loaded on Factor 3 (prolonged grief) with values >0.35. BDI-II items defined Factor 1 (depression) and PCL-S items defined Factor 2 (posttraumatic stress), with the exception of four PCL-S items (Items 9, 10, 11, and 15) that loaded on Factor 1—an expected finding, as these items assess symptoms clinically similar to depression (e.g., loss of interest, difficulty concentrating). No PCL-S item showed substantive secondary loadings (>0.35) on the prolonged grief factor.

In conclusion, in both the two-factor and three-factor solutions, prolonged grief symptoms formed a factor distinct from posttraumatic stress and depression symptoms in the traumatic bereavement sample.

Relationships Among Prolonged Grief, Posttraumatic Stress, and Depression Symptoms in Individuals Bereaved by Non-Traumatic Deaths

Bartlett's test ($\chi^2 = 6516.4, p < 0.001$) and the KMO index (0.852) confirmed the adequacy of the correlation matrix. The factor-retention procedures indicated predom-

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Table 7. Factor loading matrix for the three-factor solutions of the ICG, PCL-S/PCL-5, and BDI-II in the sample of adults bereaved by traumatic and non-traumatic deaths.

Item	Traumatic deaths			Non-traumatic deaths		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
ICG (prolonged grief)						
1. Dysfunctional thoughts about the deceased			0.564			0.791
2. Disturbing memories of the deceased			0.458			0.655
3. Non-acceptance of the death			0.630			0.780
4. Yearning for the deceased			0.770			0.457
5. Attraction to reminders of the deceased			0.628			0.416
6. Feeling angry about the death			0.753			0.799
7. Difficulty believing the death occurred			0.877			0.767
8. Feeling stunned by the death			0.863			0.824
9. Difficulty trusting people since the death			0.584			0.354
10. Feeling detached from people since the death			0.346			0.573
11. Experiencing pain or symptoms similar to those of the deceased			0.307			
12. Avoidance of memories of the deceased		0.309	0.411			
13. Feeling that life is empty without the deceased			0.752			0.688
14. Hearing the voice of the deceased			0.697			0.463
15. Seeing the deceased			0.642			0.453
16. Feeling that the death is unfair			0.521			0.683
17. Feeling bitter about the death			0.799			0.782
18. Envy of those who have not lost a loved one			0.413			0.511
19. Feelings of loneliness since the death			0.418			0.801
PCL-S/PCL-5 (posttraumatic stress)						
1/1. Recurrent distressing memories		0.398		0.324		–0.336
2/2. Nightmares		0.357				–0.349
3/3. Flashbacks		0.324				–0.382
4/4. Psychological distress in response to reminders		0.388		0.371		–0.450
5/5. Physiological reactions to reminders		0.629		0.538		
6/6. Avoiding memories, thoughts, or feelings		0.662		0.507		
7/7. Avoiding activities, places, or people		0.669		0.481		–0.305
8/8. Inability to recall aspects of the event						–0.325
9/12. Markedly diminished interest	0.652			0.525		
10/13. Feeling detached or estranged from others	0.622			0.702		
11/14. Inability to experience positive emotions	0.605			0.533		
12/–. Sense of a foreshortened future	0.335					
13/20. Difficulty falling or staying asleep	0.315	0.536		0.616		
14/15. Irritability or angry outbursts	0.343	0.393		0.743		
15/19. Difficulty concentrating	0.510	0.332		0.674		
16/17. Hypervigilance		0.530		0.686		
17/18. Exaggerated startle response	0.427	0.509		0.813		
–/9. Negative beliefs about oneself, others, and the world	–	–	–	0.543	0.304	
–/10. Blaming oneself or others for what happened	–	–	–			–0.415
–/11. Persistent negative emotional state	–	–	–	0.550		
–/16. Reckless or self-destructive behavior	–	–	–	0.645		

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Table 7. Continued.

Item	Traumatic deaths			Non-traumatic deaths		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
BDI-II (depression)						
1. Sadness	0.925				0.543	
2. Pessimism	0.863				0.628	
3. Feelings of failure	0.802	–0.370			0.720	
4. Loss of pleasure	0.709				0.590	
5. Feelings of guilt	0.740	–0.303			0.610	
6. Feelings of punishment	0.654				0.599	
7. Dissatisfaction with oneself	0.887	–0.387			0.625	
8. Self-criticism	0.823	–0.426			0.469	
9. Suicidal thoughts or wishes	0.443				0.656	
10. Crying	0.692				0.434	
11. Agitation	0.519			0.384		
12. Loss of interest	0.962				0.440	
13. Indecisiveness	0.636				0.661	
14. Worthlessness	0.895	–0.508			0.718	
15. Loss of energy	0.980				0.493	
16. Changes in sleep pattern	0.311	0.311				
17. Irritability	0.600			0.524		
18. Changes in appetite	0.743				0.412	
19. Difficulty concentrating	0.609			0.307	0.441	
20. Fatigue or tiredness	0.848				0.507	
21. Loss of interest in sex	0.609					–0.324

Note. Factor loadings below 0.30 are not reported. The factor loading matrix is the matrix rotated using a promin oblique rotation. BDI-II, Beck Depression Inventory-II; ICG, Inventory of Complicated Grief; PCL-S/PCL-5, PTSD Checklist, specific version/PTSD Checklist for DSM-5.

inantly three- or four-factor solutions (Table 5); both were therefore extracted and compared. Both solutions showed acceptable or good fit indices (Table 6).

In the three-factor solution (Table 7), all ICG items loaded on Factor 3 (prolonged grief) with factor loadings >0.35 and no substantive secondary loadings on the other factors, except for Items 11 and 12, which did not load substantively on any factor. All BDI-II items, except four (Items 11, 16, 17 and 21), loaded substantively on Factor 2 (depression). All PCL-5 items loaded substantively on Factor 1 (posttraumatic stress), with the exception of two items (Items 3 and 4) that showed substantive secondary loadings on the prolonged grief factor and three items that did not load substantively on any factor. The four-factor solution replicated these patterns, with PCL-5 items distributed across two posttraumatic stress subfactors, while ICG items remained in an independent factor with no substantive secondary loadings on the others, except for item 11 (**Supplementary Table 4**).

In conclusion, in both solutions, prolonged grief symptoms formed a factor distinct from posttraumatic stress and depression symptoms in the non-traumatic bereavement sample, replicating the pattern observed in the traumatic bereavement sample.

The analyses conducted on the non-traumatic and traumatic bereavement samples were repeated using only the 16 items shared by the PCL-S and the PCL-5. Overall, the results were similar to those obtained with the full versions of these instruments and also showed that prolonged grief symptoms constituted a distinct factor from posttraumatic stress and depression symptoms in both samples (**Supplementary Tables 5,6,7,8**).

Discussion

The primary aim of Study 2 was to determine whether the relationships among prolonged grief, posttraumatic stress, and depression symptoms differ as a function of bereavement type. The results do not support this distinction. In both samples—those bereaved by terrorist attacks and those bereaved by non-traumatic deaths—factor analyses revealed a three-factor solution with distinct fac-

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tors for prolonged grief, posttraumatic stress, and depression. Differences between samples were limited to secondary nuances: the traumatic bereavement sample also showed support for a two-factor solution (prolonged grief vs. depression-PTSD), whereas the non-traumatic bereavement sample also showed support for a four-factor solution (with two PTSD subfactors). In neither case did prolonged grief symptoms merge with posttraumatic stress or depression symptoms.

These findings are consistent with prior studies—conducted in both traumatically bereaved samples, such as those exposed to war or mass shootings [55,56], and non-traumatically bereaved samples [57,58]—that found prolonged grief to constitute a factor distinct from posttraumatic stress and depression. The present study adds the novelty of analyzing both bereavement types simultaneously with identical factor-analytic procedures, thereby providing stronger empirical support for the lack of validity of traumatic prolonged grief as a distinct construct.

Finally, the results of both samples add to the extensive literature dating back to the 1990s that supports prolonged grief as a psychopathological construct distinct from depression and PTSD, thereby reinforcing the recent decisions by the ICD-11 and the DSM-5-TR to include prolonged grief disorder in their diagnostic classifications of mental disorders.

However, these findings should be interpreted given the limitations of this study, most of which are discussed later in the Conclusions because they are also relevant to Study 1. With respect to the present study, Pearson correlations tend to attenuate associations between ordinal items relative to polychoric correlations. Because this attenuation may have differed across samples, given the higher item endorsement observed in the traumatic bereavement sample, the comparability of the joint factor solutions across samples should be considered with caution.

General Discussion

The two studies reported here examined, in a complementary fashion, the construct validity of traumatic prolonged grief. Their results do not provide empirical support for this construct: the internal structure of prolonged grief symptoms is similar in individuals bereaved by traumatic and non-traumatic deaths (Study 1), a conclusion further supported by measurement invariance analyses showing full metric invariance and largely scalar invariance (17 of 19 items) across bereavement types (Study 1), and the relationships between those symptoms and posttraumatic stress and depression symptoms are likewise similar (Study 2).

These findings are consistent with those of Jiménez-Prensa *et al*. [5], who compared bereaved individuals with prolonged grief following traumatic versus non-traumatic bereavement and similarly found no empirical support for traumatic prolonged grief, in that prolonged grief symptoms most similar to PTSD were not the most predominant nor did greater posttraumatic stress symptomatology co-occur more frequently.

The findings are also consistent with the DSM-5-TR's decision to remove the "with traumatic bereavement" specifier that had been introduced in the DSM-5 for persistent complex bereavement disorder.

The absence of support for the traumatic prolonged grief construct does not imply, however, that the type of death is irrelevant: as the literature has demonstrated, traumatic deaths—including those resulting from terrorist attacks—increase the severity of grief reactions and the likelihood of developing prolonged grief relative to natural deaths [59,60]. In fact, in the present research, adults bereaved by terrorist attacks exhibited significantly higher levels of prolonged grief symptoms and a higher prevalence of clinically significant prolonged grief symptoms than adults bereaved by non-traumatic death.

On the other hand, future research should examine other sources of construct validity evidence that could support the existence of prolonged traumatic grief as a construct distinct from prolonged grief. For example, after controlling for symptom severity, researchers could investigate whether the two constructs differ in terms of functional impairment, longitudinal course, treatment response, comorbidity, and incremental predictive validity.

The results and conclusions should be interpreted in light of several limitations of the present studies. First, both samples were convenience samples rather than random samples, limiting the generalizability of the findings. Second, the ICG, although the most widely used instrument, does not fully align with the more recent definitions of prolonged grief disorder in the DSM-5-TR and ICD-11. Future research should replicate these results with random samples and with measures such as the PG-13-R [52] or the TGI-SR+ [53]. Third, the two bereavement samples differed not only in the type of death experienced but also in other bereavement-related variables, including the time elapsed since the loss and the participant's relationship to the deceased. These differences may have influenced the results. Accordingly, future research should seek to replicate these

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findings using samples matched on these characteristics. Fourth, the traumatic bereavement sample included only individuals bereaved by terrorist attacks. Therefore, future research should include individuals bereaved by other types of traumatic death, such as suicide, homicide, accidents, or disasters, to determine whether the results can be generalized to other forms of traumatic bereavement. Fifth, in this research, factor loadings were evaluated using a cutoff of 0.35, following the recommendations of Hair *et al*. [34] for interpreting factor loadings according to sample size and considering the size of the non-traumatic bereavement sample in Study 1. Nevertheless, applying the more stringent cutoff of 0.40, which is often used irrespective of sample size and is more appropriate for the sample sizes in Study 2, does not alter the results or conclusions of either study. Sixth, the procedure used to assess the causes of death did not allow for a detailed examination of the circumstances surrounding the death. Consequently, deaths reported by participants as resulting from illness or old age may encompass highly heterogeneous circumstances and, in some cases, may have occurred under potentially traumatic conditions. Finally, there was a substantial reduction in sample size in between the initial and final traumatic bereavement samples, partly because many participants interviewed by telephone were either unable or unwilling to travel to the city where the in-person assessment including the ICG, the BDI-II, and the PCL-S/PCL-5 was conducted. This reduction may have introduced selection bias and affected the representativeness of the sample.

Despite these limitations, the findings suggest that prolonged grief following a traumatic death is similar, in terms of its symptom structure and its relationships with posttraumatic stress and depression, to prolonged grief following a non-traumatic death. The primary clinical implication is that psychological treatments shown to be effective for prolonged grief following non-traumatic bereavement—such as those reviewed by Johannsen *et al*. [11] and Pleshka *et al*. [12]—are also likely to be effective for individuals with prolonged grief following a traumatic death, notwithstanding the treatment of any comorbid disorders they may present.

Conclusions

In summary, the findings of the two studies indicate that, although traumatic deaths are associated with more severe grief reactions and a higher likelihood of developing prolonged grief than natural deaths, traumatic prolonged grief cannot be considered a construct distinct from prolonged grief, as both the internal structure of prolonged grief symptoms and their associations with posttraumatic stress and depressive symptoms are similar in individuals bereaved by traumatic and natural deaths.

Availability of Data and Materials

The data supporting this study are available from the corresponding author upon reasonable request.

Author Contributions

AS: Conceptualization; data curation; investigation; resources; writing—original draft preparation; writing—review & editing. MPGV: Conceptualization; funding acquisition; methodology; project administration; resources; supervision; writing—review & editing. AJP: Data curation; investigation; resources; writing—review & editing. AGM: Data curation; investigation; resources; writing—review & editing. NM: Data curation; investigation; writing—review & editing. ASG: Data curation; investigation; writing—review & editing. JS: Conceptualization; formal analysis; funding acquisition; methodology; project administration; resources; supervision; writing—original draft preparation; writing—review & editing.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Faculty of Psychology of the Complutense University of Madrid, on October 11, 2011, and subsequently by the Research Ethics Committee of the Complutense University of Madrid (ref.: CE_20221013-10_SAL), and was conducted in compliance with the Declaration of Helsinki. Prior to participating, eligible individuals were provided with informed consent, which detailed the purpose of the research, the voluntary nature of participation, and data confidentiality. The participants consented to publish their data in a scientific journal.

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Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.62641/aep.2393.

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