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**RESEARCH ARTICLE**

# Psychometric evaluation of the Chinese version of the Utrecht Grief Rumination Scale

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Given the severe mental health consequences that may ensue after bereavement, it is crucial to better understand malleable cognitive factors that are associated with poorer bereavement outcomes. Grief rumination (i.e., repetitive thinking about the causes and consequences of a loss) is a malleable cognitive process that is concurrently and longitudinally associated with postloss mental health problems. To assess grief rumination, the English and Dutch Utrecht Grief Rumination Scale (UGRS) were recently developed. The current study examined the reliability and validity of a Chinese version of the UGRS. Three hundred and ninety-three Chinese adults (56% women) bereaved on average 16.88 months ago filled out online questionnaires assessing demographic and loss-related characteristics, grief rumination (UGRS), trait rumination, trait mindfulness, and anxiety, depressive, and prolonged grief symptoms. Confirmatory factor analyses showed that a second-order five-factor hierarchical model provided the most optimal factor structure for the Chinese UGRS. UGRS total scale and subscale scores demonstrated acceptable internal consistency. Grief rumination had a moderate positive association with trait rumination and a low negative association with trait mindfulness, providing convergent and discriminant validity evidence. Test-criterion validity evidence was also provided. UGRS scores could distinguish bereaved groups with different relationships with the deceased. Moreover, grief rumination was associated with symptoms of anxiety, depression, and prolonged grief even after controlling for demographic and loss-related variables, trait rumination, and trait mindfulness. The Chinese UGRS appears a valid and reliable instrument to assess grief rumination in Chinese bereaved individuals.

**KEYWORDS**

Chinese, grief, mindfulness, repetitive thought, rumination, scale

## 1 | INTRODUCTION

Bereavement, defined as the situation of having recently lost a person close to oneself due to death (Stroebe, Hansson, Stroebe, & Schut, 2001), is a highly stressful life event (Holmes & Rahe, 1967). While most people adjust to bereavement without professional mental health intervention, it is associated with excess risk of mortality, decrements in physical health (Stroebe, Schut, & Stroebe, 2007), higher prevalence of mental health problems including depression and post-

traumatic stress (Zisook et al., 2014), long-term functional disability, and lower quality of life (Prigerson et al., 2009).

Over the past decades, research interest has been increasing for persistent, severe, and disabling grief, also termed complicated grief (e.g., Horowitz et al., 2003; Prigerson et al., 1995) or prolonged grief (Prigerson et al., 2009). The term prolonged grief will be used throughout this manuscript to refer to this phenomenon. The newly released International Classification of Diseases 11 (ICD-11) has included a bereavement-related disorder, named prolonged grief disorder (PGD;

World Health Organization, 2018). PGD according to the ICD-11 consists of a persistent and pervasive grief response beyond 6 months postloss characterized by severe longing for the deceased and/or persistent preoccupation with the deceased accompanied by intense emotional pain, including sadness, guilt, anger, denial, blame, difficulty accepting the death, feeling one has lost a part of one's self, an inability to experience positive mood, emotional numbness, and difficulty in engaging with social or other activities. Prevalence of PGD in bereaved individuals was estimated to be 9.8% in a recent meta-analysis (95% CI [6.8,14.0]; Lundorff, Holmgren, Zachariae, Farver-Vestergaard, & O'Connor, 2017).

Given the severe consequences of bereavement, researchers have aimed to understand the changeable mechanisms that may underlie postloss mental health problems, so that such mechanisms can be targeted in treatment. A key modifiable cognitive process and risk factor following bereavement is rumination, broadly defined as the process of thinking repetitively and/or recurrently about the causes and consequences of negative events and/or negative emotions (Michael, Halligan, Clark, & Ehlers, 2007). Earlier work on rumination in the bereavement predominantly aimed to clarify the role of depressive rumination, which involves repetitively and passively focusing on one's depressive symptoms and the causes and consequences of these symptoms (e.g., Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2001). According to Nolen-Hoeksema's response styles theory, depressive rumination fuels depression by (a) increasing accessibility of negative cognitions, (b) reducing instrumental behaviour, (c) impairing problem solving, and (d) driving away social support (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Depressive rumination was found to be concurrently and/or longitudinally associated with postloss depressive symptoms (Ito et al., 2003; Morina, 2011; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, Parker, & Larson, 1994), post-traumatic stress symptoms (Morina, 2011; Nolen-Hoeksema, McBride, & Larson, 1997), and prolonged grief symptoms (Delespaux & Zech, 2015; Morina, 2011).

Originally developed in the context of depression and focusing exclusively on the measurement of thoughts about depressive feelings and symptoms, the most-used scale to assess depressive rumination, the ruminative response scale (Nolen-Hoeksema & Morrow, 1991), does not capture all ruminative thoughts typically elicited by bereavement. Rumination has been conceptualized as a thinking style that aims to reduce the discrepancy between the present situation and a desired but unachieved standard (Martin & Tesser, 1996). Therefore, rumination after loss will focus on the causes and consequences of the loss event (Eisma et al., 2014; cf. Michael et al., 2007) and the wide variety of negative emotions experienced after bereavement, instead of solely on depressive symptoms (cf. Nolen-Hoeksema, 2001).

To assess such grief-related rumination, formally defined as repetitive and recurrent thought about causes and consequences of a loss, Eisma et al. (2014) developed the 15-item Utrecht Grief Rumination Scale (UGRS). The UGRS consists of five factors: (a) thoughts about negative (emotional) reactions to the loss, (b) thoughts about the unfairness of the death, (c) counterfactual thoughts about the events leading up to the death (i.e., imagining alternative past realities in which the person would not have died), (d) thoughts about the

### Key Practitioner Message

- Confirmatory factor analysis supported a second-order five-factor hierarchical structure of Utrecht Grief Rumination Scale (UGRS) in a Chinese bereaved sample.

- Internal consistency of the Chinese UGRS and its subscales was acceptable.

- Validity of the Chinese UGRS was supported by convergent, discriminant, and test-criterion validity evidence.

- The Chinese UGRS is a valid and reliable instrument to assess grief rumination in Chinese bereaved people.

meaning and consequences of the loss, and (e) thoughts related to reactions of others. The Dutch and English versions of the UGRS have been shown to be cross-culturally equivalent and have demonstrated excellent internal consistency and good validity (Eisma et al., 2014). For example, supporting test-criterion validity, grief rumination assessed with the UGRS was associated with symptoms of depression, PTSD, and prolonged grief over and above demographic and loss-related characteristics, depressive and trait rumination, and neuroticism in bereaved individuals both concurrently and longitudinally (e.g., Eisma et al., 2012; Eisma et al., 2014; Eisma, Schut, et al., 2015; for a review: Eisma & Stroebe, 2017).

With the help of the UGRS, researchers have shed further light on the role of grief rumination subtypes in the persistence of postloss mental health problems. For example, grief rumination about injustice and the reactions of others were shown to be maladaptive, predicting higher prolonged grief and depression levels over a 6-month interval, whereas grief rumination focused on understanding one's emotional reactions had adaptive effects, predicting reductions in prolonged grief and depression levels over 12 months (Eisma, Schut, et al., 2015).

Despite the potential importance of grief rumination in the grieving process, next to nothing is known about this phenomenon in Asian cultures. Notable in this context is a study by Bonanno, Papa, Lalande, Zhang, and Noll (2005), which suggested that the frequency and trajectory of cognitive grief processing as well as its relationship with longitudinal distress may be different across cultures. In a longitudinal study, they demonstrated that a Chinese sample reported significantly more grief processing (i.e., recurrent thinking about the loss) 4 months after the loss than an American sample, and both samples' grief processing decreased significantly over a 14-month interval. At 18 months postloss, the initial difference between the two samples was no longer statistically significant. Moreover, 4-month grief processing was positively related to 18-month distress in the American sample but not in the Chinese sample. Considering this potential cultural difference in cognitive processing, careful examination of the UGRS' reliability and validity is necessary before using the UGRS in research on Chinese bereaved people. Therefore, the present study aims to evaluate the psychometric properties of the Chinese UGRS.

Specifically, we examined the reliability and validity of the Chinese UGRS. With regard to the validity, we first conducted

confirmatory factor analyses to examine the internal structure of the UGRS. We expected that a one-factor structure would provide a less robust fit than a correlated five-factor structure, and a hierarchical structure with five factors and one higher-order factor, since previous validation research demonstrated a correlated five-factor structure fit the Dutch and English UGRS data best, but a hierarchical factor structure fit nearly equally well (Eisma et al., 2014). Convergent and discriminant validity were tested by investigating the correlations between grief rumination and trait rumination and trait mindfulness, respectively. We expected a moderate or high correlation between grief rumination and trait rumination (Eisma et al., 2012, 2014) and a low association between grief rumination and trait mindfulness (cf. Raes & Williams, 2010). Next, test-criterion validity was examined. First, we predicted that people who had lost a child or a spouse would experience more ruminative thoughts than those who had lost a parent (Eisma et al., 2014). Second, we hypothesized that grief rumination would be positively associated with symptoms of psychopathology (i.e., anxiety, depression, and prolonged grief) over and above relevant demographic and loss-related variables, trait rumination, and trait mindfulness.

## 2 | METHOD

### 2.1 | Participants

The participants were 393 Chinese adults (44% male, 56% female, mean age = 31.94, SD = 7.25) who had lost a first-degree relative on average 16.88 months ago (SD = 30.55). Detailed demographic and loss-related information can be found in Table 1. Scores on rumination, mindfulness, and symptoms of psychopathology of the sample are shown in Table 2.

### 2.2 | Procedure

Participants were recruited in two ways, namely via the Internet through announcements on Chinese memorial websites where bereaved individuals can build a virtual memorial hall for the deceased, and through advertisements in the researchers' social network in China. It should be noted here that approximately half (50.3%) of Chinese residents have Internet access, and that those who have access are on average younger than the general population (China Internet Network Information Center, 2017). Interested individuals linked through to a website specifically designed for the online survey. An introduction to the current research project (e.g., information on study goals, benefits and potential risks of study participation, voluntariness of participation, and confidentiality) and an informed consent form were shown on the first page of the survey. Questionnaires could only be accessed after an interested individual ticked the "I understand the procedures described above and agree to participate in this study" box. Five-hundred fifty-five people started the survey, but 161 (29.1%) did not complete it. The present study only included complete responses (n = 393).

**TABLE 1** Demographic and loss-related information of the participants

| Variables | M (SD) or N (%) |
|---|---|
| Age | 31.94 (7.25) |
| Sex | |
|   Male | 172 (43.8%) |
|   Female | 221 (56.2%) |
| Highest education | |
|   Secondary school | 43 (10.9%) |
|   Undergraduate | 326 (83.0%) |
|   Postgraduate | 24 (6.1%) |
| Religious belief | |
|   None | 283 (72.0%) |
|   Chinese god | 11 (2.8%) |
|   Buddhism | 76 (19.3%) |
|   Taoism | 5 (1.3%) |
|   Christianity | 15 (3.8%) |
|   Others[a] | 3 (0.8%) |
| Relationship with the deceased | |
|   Spouse | 43 (10.9%) |
|   Child | 38 (9.7%) |
|   Parent | 132 (33.6%) |
|   Sibling | 180 (45.8%) |
| Time since the death (months) | 16.88 (30.55) |
| Age of the deceased | 39.75 (20.77) |
| Cause of the death[b] | |
|   Chronic illness[c] | 86 (21.9%) |
|   Acute illness | 148 (37.7%) |
|   Accident | 155 (39.4%) |
|   Suicide | 4 (1.0%) |

*Note.* [a]One believed in Catholicism, one believed in Islam, and one wrote: "I believe a bit in every religion."

[b]No responses to the option "other," so it is not displayed here.

[c]Participants were instructed that chronic illness is an illness that lasted for more than 3 months before the death.

**TABLE 2** Means and standard deviations of measures of rumination, mindfulness and symptoms.

| Scale | M | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| UGRS total | 46.46 | 10.27 | −0.15 | 0.001 |
| UGRS reactions | 9.44 | 2.34 | −0 36 | 0.16 |
| UGRS injustice | 9.49 | 2.72 | −0.25 | −0.39 |
| UGRS counterfactuals | 9.06 | 2.70 | −0.10 | −0.35 |
| UGRS meaning | 9.31 | 2.33 | −0.12 | −0.16 |
| UGRS reactions of others | 9.17 | 2.56 | −0.29 | −0.39 |
| RRQ rumination | 38.99 | 7.24 | −0.64 | 0.88 |
| MAAS | 57.48 | 12.92 | −0.31 | −0.37 |
| HADS anxiety | 10.95 | 3.73 | 0.18 | 0.11 |
| HADS depression | 12.76 | 3.71 | 0.03 | 0.36 |
| PG-13 | 28.49 | 9.19 | 0.33 | −0.80 |

*Note.* HADS: Hospital Anxiety and Depression Scale; MAAS: Mindful Attention Awareness Scale; PG-13: Prolonged Grief Questionnaire; RRQ: Rumination Reflection Questionnaire; UGRS: Utrecht Grief Rumination Scale.

## 2.3 | Measures

### 2.3.1 | Demographic and loss-related characteristics

Characteristics of the participants (age, sex, highest education level, and religious belief) and characteristics of the deceased and the loss (relationship with the deceased, time since the death, age of the deceased, sex of the deceased, and cause of the death) were measured with a questionnaire constructed by the authors.

### 2.3.2 | Grief rumination

The UGRS (Eisma et al., 2012, 2014) is a 15-item questionnaire designed to measure grief-specific rumination. Participants could rate how frequently they had experienced certain types of ruminative thoughts in the past month on a five-point scale ranging from 1 (*never*) to 5 (*very often*). The UGRS assesses ruminative thoughts with three-item subscales across five topics: (a) reactions (e.g., How often in the past month did you try to analyse your feelings about this loss precisely?), (b) injustice (e.g., How often in the past month did you wonder why this had to happen to you and not someone else?), (c) counterfactuals (e.g., How often in the past month did you analyse if you could have prevented the death?), (d) meaning (e.g., How often in the past month did you analyse what the personal meaning of the loss is to you?), and (e) reactions of others (e.g., How often is the past month did you think about how you would like others to react to your loss?). Sum scores of the overall scale and subscales were computed, with higher scores indicating higher levels of grief rumination and grief rumination subtypes. The English version of the UGRS was translated to Chinese by an independent Chinese native speaker fluent in English and majored in psychology, and then back-translated into English by another independent researcher fluent in both English and Chinese and majored in English and psychology. The original and back-translated English versions were compared and discussed by the authors, in order to ensure conceptual equivalence between the two versions. Finally, adjustments to the Chinese version were made to address some minor differences between the two versions. The Chinese version of UGRS can be found in a Data S1.

### 2.3.3 | Rumination

The rumination subscale of the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999; Chinese version: Yuan, Peng, Huang, & Zhou, 2010) is a 12-item measure used to assess trait rumination, and was included to assess convergent validity evidence for the Chinese UGRS. Participants could indicate to what extent each of 12 statements about rumination were applicable to them on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate higher trait tendencies to ruminate. The internal consistency of the rumination subscale scores in the current sample was good, $\alpha$ = 0.81.

### 2.3.4 | Mindfulness

The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003; Chinese version: Deng et al., 2012) is a 15-item questionnaire used to assess mindfulness and to evaluate discriminant evidence for the validity of the Chinese UGRS. Participants could rate how frequently they currently have everyday experiences described in 15 statements on a six-point scale ranging from 1 (*almost always*) to 6 (*almost never*). Higher average scores reflect higher levels of dispositional mindfulness. The internal consistency of the MAAS scores in the current sample was excellent, $\alpha$ = 0.92.

### 2.3.5 | Symptoms of anxiety and depression

The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983; Chinese version: Ye & Xu, 1993) is a 14-item measure designed to assess symptoms of anxiety and depression, and was used to evaluate the test-criterion evidence for the validity of the Chinese URGS. It consists of an anxiety subscale and a depression subscale that each contains seven items. Participants could indicate how often or to what extent they had certain experiences in the past week on four-point scales ranging from 0 to 4 (anchors differ). Higher sum scores indicate higher symptom levels of anxiety and depression. The internal consistencies of both the anxiety and depression subscale scores were acceptable to good in the present sample, $\alpha$ = 0.80 and $\alpha$ = 0.78, respectively.

### 2.3.6 | Symptoms of prolonged grief

The Prolonged Grief Questionnaire (Prigerson et al., 2009; Chinese version: He, Wang, Tang, Yu, & Xie, 2013) was used to measure symptoms of prolonged grief, and served as another indicator for the test-criterion validity evidence for the validity of the Chinese URGS. The Prolonged Grief Questionnaire consists of 11 Likert-scale items describing prolonged grief symptoms and two categorical items (one item on time since loss, and one item on functional impairment). The 11 items to assess prolonged grief symptoms were used in the current study. Participants could rate the frequency and intensity of prolonged grief symptoms on a five-point scale ranging from 1 (*not at all*) to 5 (*several times a day/overwhelming*). Higher sum scores indicate higher symptom levels of prolonged grief. The internal consistency of the scores of the 11 items in the current sample was excellent, $\alpha$ = 0.91.

## 2.4 | Statistical analysis

There was no missing data because answering each question of the online survey was required before questionnaire scores could be submitted. To examine the factor structure of the Chinese UGRS, confirmatory factor analyses were conducted using Mplus 7.1. Items were treated as continuous variables and the method of estimation was maximum likelihood. Specifically, we compared the fit of a one-factor structure with a hierarchical structure with one higher-order factor and five subfactors and a correlated five-factor structure. In assessing model fit, conventional standards outlined by Kline (2016) were employed, such that adequate fit will be based on a non-significant test of model $\chi^2$, $\chi^2/df$ of between 2 and 3, comparative fit index and Tucker-Lewis index of greater than 0.90, root mean square error of approximation of less than 0.08, and a standardized root mean square residual of less than 0.08. The Akaike information criterion is

also used to compare the models with the lowest Akaike information criterion value indicating the best fit for the data. Parameter estimates of factor loadings and intercorrelations between factors were also computed. Factor intercorrelations above 0.85 were interpreted to imply poor discriminant ability between factors and that a more parsimonious solution could be obtained (Brown, 2014).

Cronbach's alphas were calculated for the scores of UGRS and each subscale to determine their internal consistency. To examine the convergent and discriminant evidence for the validity of the UGRS, Pearson correlations were computed and the Fisher's $z$-test was conducted to compare coefficients of the associations of grief rumination with trait rumination and trait mindfulness. Moreover, independent sample $t$-tests and one-way ANOVAs were performed to compare the Chinese UGRS scores across groups categorized by relationship with the deceased so as to examine the potential of the UGRS scores to differentiate relevant subgroups. Multiple regressions were conducted to examine the UGRS scores associations with mental health symptoms. SPSS 22.0 was used to perform the above analyses, using a two-sided significance level of 0.05.

## 3 | RESULTS

### 3.1 | Factor structure

The one-factor, five-factor, and second-order five-factor model with one higher order factor confirmatory factor analyses' model fit were estimated (Table 3).

Because the $\chi^2$ is quite sensitive to large sample sizes, its significance implied an inadequate fit (all models' $p < 0.001$). However, other indices suggested that in contrast to the one-factor model, both of the five-factor correlated model and the second-order hierarchical model fitted the Chinese bereaved individuals' data acceptably. In the five-factor correlated model, factor loadings ranged from 0.58 to 0.75, and correlations between factors varied between 0.69 and 0.97. In the second-order hierarchical model, factor loadings of the second-order factors on the highest factor ranged from 0.85 to 0.99. Item loadings on the second order factor ranged from 0.58 to 0.72. All parameters were significant, $p < 0.001$. Although all indices except the Tucker-Lewis index appeared to indicate that the correlated five-factor model provided a better fit for the current data, considering the high intercorrelations between some of the five factors, the second-order hierarchical model was chosen to represent the factor structure of grief rumination assessed with the UGRS. The correlated five-factor structure and coefficients of each path are shown in Figure 1. The second-order hierarchical model and coefficients of each path are shown in Figure 2.

### 3.2 | Reliability

The internal consistency of the UGRS total score was excellent, $\alpha = 0.90$. Scores of three subscales of the Chinese UGRS demonstrated acceptable reliability, with Cronbach's alphas of 0.72 (injustice), 0.73 (counterfactuals), and 0.71 (meaning), whereas the scores of the other two subscales showed borderline acceptable reliability, with Cronbach's alphas of 0.65 (reactions) and 0.69 (reactions of others). The item-total correlations further supported the reliability of the Chinese UGRS, with all item scores correlating positively with the total scale and their respective subscale scores. All item-total correlations were moderate to strong for the total scale ($0.51 \leq r \leq 0.64$) and all subscales ($0.46 \leq r \leq 0.60$). In addition, no Cronbach's alphas of the total scale and all subscales would become greater than the current value if any of the items were deleted.

Correlations between each of the UGRS subscale scores and the UGRS total scale scores were strong (all ≥0.80), whereas intercorrelations amongst the subscales were weaker, $0.50 \leq r \leq 0.62$, reflecting a relatively smaller overlap between subscales than between each subscale and the total scale (see Table 4).

### 3.3 | Validity

#### 3.3.1 | Convergent validity evidence

As shown in Table 5, a moderate correlation was found between UGRS total score and Rumination Reflection Questionnaire rumination subscale score, $r = 0.39$, which demonstrated adequate convergent validity evidence of the Chinese UGRS. Associations between the subscales of the UGRS and trait rumination were also moderate in size ($0.31 \leq r \leq 0.37$), except for the meaning subscale, $r = 0.26$.

#### 3.3.2 | Discriminant validity evidence

Discriminant validity of the UGRS was supported by the fact that the correlation between grief rumination and trait mindfulness (MAAS) was smaller than that between grief rumination and trait rumination, $r = -0.17$, $z(393) = 8.15$, $p < 0.001$. Correlation coefficients between UGRS subscales and mindfulness ranged from non-significant to small ($-0.05 \leq r \leq -0.23$).

#### 3.3.3 | Test-criterion validity evidence

Grief rumination levels differed according to the type of relationship with the deceased, $F(3, 389) = 4.51$, $p = 0.004$. Specifically, compared with participants who had lost a sibling, those who had lost a spouse reported more ruminative thoughts, $t(221) = 3.43$, $p = 0.001$,

**TABLE 3** Confirmatory factor analyses of the Chinese UGRS

| Model | $\chi^2$ | df | $\chi^2/df$ | CFI | TLI | RMSEA | SRMR | AIC |
|---|---|---|---|---|---|---|---|---|
| One-factor | 302.41 | 90 | 3.36 | 0.897 | 0.880 | 0.077 | 0.050 | 15,662.68 |
| Five-factor correlated | 174.94 | 80 | 2.19 | 0.954 | 0.939 | 0.055 | 0.037 | 15,555.20 |
| Second-order five-factor | 211.01 | 85 | 2.48 | 0.939 | 0.942 | 0.061 | 0.043 | 15,581.27 |

*Note.* AIC: Aikaike information criterion; CFI: Comparative Fit Index; *df*: degree of freedom; RMSEA: Root Mean Squared Error of Approximation; SRMR: Standardized Root Mean Squared Residual; TLI: Tucker-Lewis index; UGRS: Utrecht Grief Rumination Scale. $\chi^2$ = Chi-square.
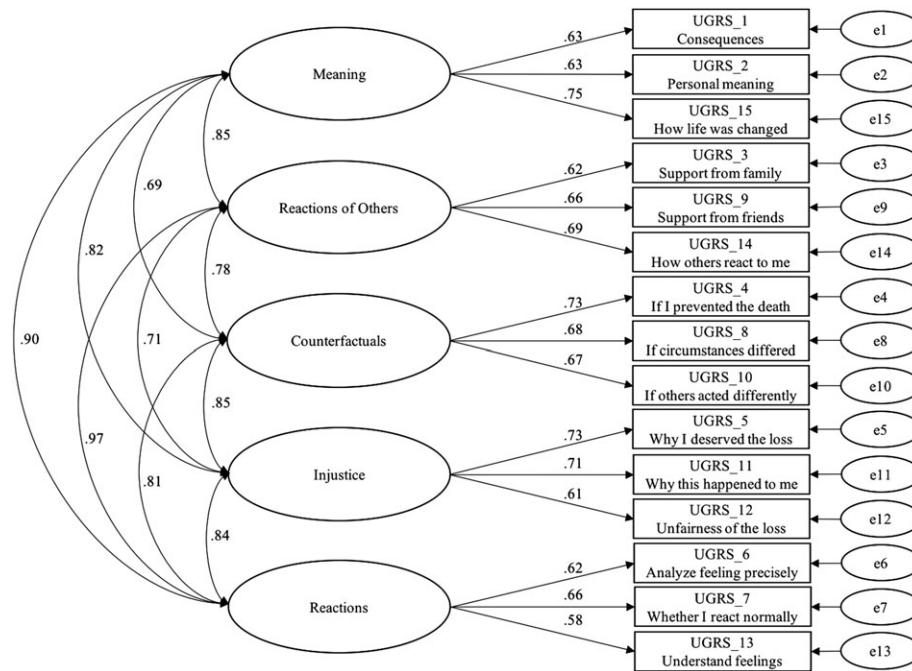
**FIGURE 1** Correlated five-factor structure of the Chinese Utrecht Grief Rumination Scale (UGRS).
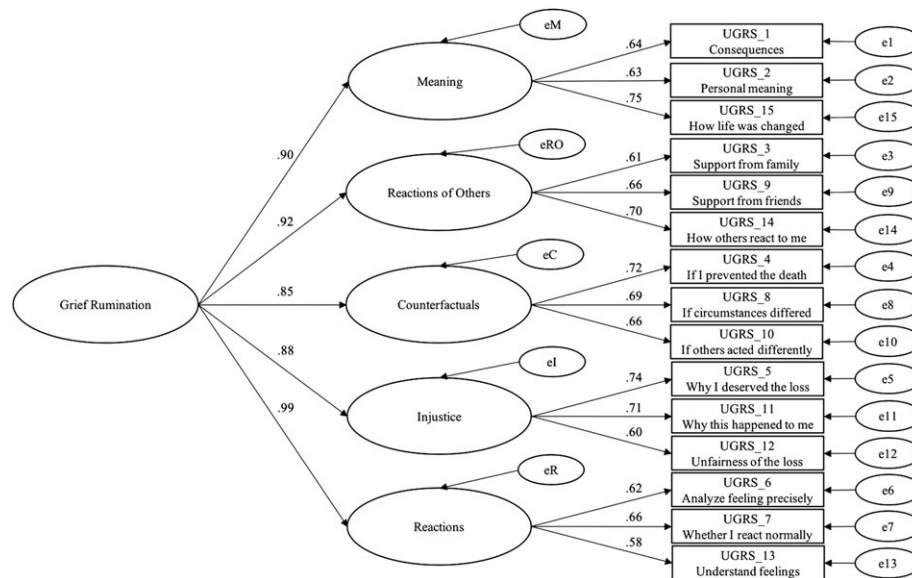


**FIGURE 2** Second-order five-factor structure of the Chinese Utrecht Grief Rumination Scale (UGRS).

**TABLE 4** Correlations amongst UGRS subscales.

|  | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. UGRS total | - |  |  |  |  |  |
| 2. UGRS reactions | 0.83 | - |  |  |  |  |
| 3. UGRS injustice | 0.81 | 0.57 | - |  |  |  |
| 4. UGRS counterfactuals | 0.81 | 0.55 | 0.62 | - |  |  |
| 5. UGRS meaning | 0.80 | 0.62 | 0.58 | 0.50 | - |  |
| 6. UGRS reactions of others | 0.81 | 0.65 | 0.50 | 0.55 | 0.60 | - |

*Note.* UGRS: Utrecht Grief Rumination Scale. All correlations are significant at $p < 0.01$.

**TABLE 5** Zero-order correlations between the UGRS and other constructs

|  | RRQ rumination | MAAS | HADS anxiety | HADS depression | PG-13 |
|---|---|---|---|---|---|
| UGRS total | 0.39 | −0.17 | 0.38 | 0.27 | 0.65 |
| UGRS reactions | 0.31 | −0.05 ns | 0.18 | 0.14 | 0.46 |
| UGRS injustice | 0.31 | −0.18 | 0.41 | 0.30 | 0.59 |
| UGRS counterfactuals | 0.37 | −0.23 | 0.41 | 0.27 | 0.57 |
| UGRS meaning | 0.26 | −0.07 ns | 0.30 | 0.25 | 0.51 |
| UGRS reactions of others | 0.32 | −0.14 | 0.23 | 0.15 | 0.49 |

*Note.* HADS: Hospital Anxiety and Depression Scale; MAAS: Mindful Attention Awareness Scale; PG-13: Prolonged Grief questionnaire; RRQ: Rumination Reflection Questionnaire; UGRS: Utrecht Grief Rumination Scale. *ns* = not significant. All correlations are significant at $p < 0.01$, unless indicated otherwise.

$d = 0.58$. No significant differences were found amongst people who had lost a parent, a spouse, or a child.

Three separate hierarchical multiple regression analyses were run on anxiety, depression, and prolonged grief symptoms, respectively. Independent variables were entered in three blocks: (a) loss-related variables that were previously reported as risk factors amongst Chinese bereaved people (i.e., gender of the deceased, age of the deceased, time since the loss, relationship with the deceased, and cause of death; He et al., 2014); (b) trait rumination and trait mindfulness; and (c) grief rumination. Relationship with the deceased was coded into three dummy variables with sibling as the reference group that was given the value 0, namely spouse versus sibling, parent versus sibling, and child versus sibling. Cause of the death was also coded into three dummy variables with chronic illness as the reference group that was assigned the value 0, namely acute illness versus chronic illness, accident versus chronic illness, and suicide versus chronic illness. Although only four people had experienced bereavement due to suicide, we decided to retain the dummy for its comparison with bereavement due to chronic illness, as even low participant numbers are adequate for the reliable estimation of regression coefficients (Austin & Steyerberg, 2015).

As shown in Table 6, grief rumination concurrently predicted significant amounts of additional variance in symptom levels of anxiety (6%), $\Delta F$ (1, 380) = 33.02, $p < 0.001$, depression (3%), $\Delta F$ (1, 380) = 14.98, $p < 0.001$, and prolonged grief (30%), $\Delta F$ (1, 380) = 215.30, $p < 0.001$, over and above relevant demographic and loss-related variables, trait rumination, and trait mindfulness. Regression weights appear to suggest that grief rumination was a better predictor than demographic and loss-related variables, and trait rumination for anxiety, depressive, and prolonged grief symptoms. Moreover, grief rumination had a stronger association than trait mindfulness with prolonged grief symptoms.

## 4 | DISCUSSION

Grief-specific rumination is a common phenomenon experienced by individuals who have lost a significant other due to death. Given the growing interest in exploring cognitive and behavioural mechanisms

**TABLE 6** Predictive values of the UGRS for symptoms of psychopathology after controlling for relevant loss-related variables, trait rumination (RRQ), and trait mindfulness (MAAS)

|  | Variables | $R^2$ change | Beta (final model) |
|---|---|---|---|
| **Anxiety** |  |  |  |
| Block 1 | Spouse | 0.12*** | 0.14** |
|  | Suicide |  | 0.09* |
| Block 2 | RRQ rumination | 0.20*** | 0.14** |
|  | MAAS |  | −0.31*** |
| Block 3 | UGRS | 0.06*** | 0.26*** |
| **Depression** |  |  |  |
| Block 1 | Spouse | 0.09*** | 0.11* |
|  | Suicide |  | 0.10* |
| Block 2 | RRQ rumination | 0.10*** | 0.05 ns |
|  | MAAS |  | −0.25*** |
| Block 3 | UGRS | 0.03*** | 0.20*** |
| **Prolonged Grief** |  |  |  |
| Block 1 | Loss-related variables[a] | 0.07** | ns |
| Block 2 | RRQ rumination | 0.10*** | −0.02 ns |
|  | MAAS |  | −0.18*** |
| Block 3 | UGRS | 0.30*** | 0.62*** |

*Note.* MAAS: Mindful Attention Awareness Scale; RRQ: Rumination Reflection Questionnaire; UGRS: Utrecht Grief Rumination Scale. *ns* = not significant.

[a]Gender of the deceased, age of the deceased, postloss months, relationship with the deceased (3 dummy variables), cause of the death (3 dummy variables).

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

underlying the grieving process in the Chinese culture (e.g., Xiu, Maercker, Yang, & Jia, 2017; Yu et al., 2017), there is a pressing need for valid and reliable instruments that capture the heterogeneous manifestation of grief-specific rumination. To facilitate this process, the current study evaluated the psychometric properties of a Chinese version of the UGRS. Strong support for the reliability and validity of the Chinese UGRS was found.

The validity of the Chinese UGRS was first supported by its factor structure. Confirmatory factor analysis pointed to acceptable fits of both of the five-factor correlated model and the a five-factor second-order hierarchical model to the UGRS data, which parallels findings on the factor structure of the original Dutch version and the English version of the UGRS (Eisma et al., 2014). The five factors identified in our factor analyses correspond with the previously identified subscales of the UGRS. However, since the intercorrelations between the five factors of the Chinese UGRS were higher than those in previous validation studies (Eisma et al., 2014: see also: Doering, Barke, Friehs, & Eisma, 2018), the five-factor model with one second-order common factor was judged to better reflect the factor structure of grief rumination amongst Chinese bereaved people. This pattern of findings supports the claim that the UGRS can be used both as a general measure of grief-specific ruminative thought and a measure to assess grief rumination subtypes.

Evaluation of reliability demonstrated excellent internal consistency for the total Chinese UGRS. While the internal consistency estimates for subscales in the Chinese sample were less robust compared with the total UGRS, and to those in the Dutch and English samples, the injustice, counterfactuals, and meaning subscales still

demonstrated adequate internal reliability. The reactions and reactions of others subscales received somewhat lower reliability estimates than other subscales.

The validity was further supported by correlational analyses. First, the total Chinese UGRS was moderately associated with trait rumination, which aligns with previous findings in a Dutch sample ($r = 0.34$, $z = 0.75$, $p = 0.45$; Eisma et al., 2012), and in an English sample ($r = 0.29$, $z = 1.55$, $p = 0.12$; Eisma et al., 2014). The medium-sized correlations between trait rumination and UGRS subscale scores (i.e., reactions, injustice, counterfactuals, meaning, and reactions of others) also provided convergent validity evidence. Perhaps unsurprisingly, individuals with the trait tendency to engage in self-focused maladaptive thought (Trapnell & Campbell, 1999), also ruminate more about the causes and consequences of a loss in a given period of time (i.e., the past month in the current study). Second, the total Chinese UGRS scores were less strongly related to trait mindfulness than trait rumination.

The potential of the UGRS to differentiate subgroups was evaluated by comparing means of the Chinese UGRS total scores amongst bereaved groups with different relationships with the deceased. Widows and widowers were found to ruminate more than those who had lost a sibling. Contrary to findings in the Dutch and English validation samples that people bereaved of a child or partner ruminated more than people who lost a parent, no such difference was found between these groups in Chinese bereaved people. Considering that the traditional Chinese moral code xiao (filial piety) exerts a potentially strong social pressure of parental caretaking on adult children (Zhan & Montgomery, 2003), the death of a parent may be interpreted as not having taken good care of the parent, and thus a failure to fulfil one's obligations as a child. Therefore, it is understandable that the Chinese bereaved adult children may experience more grief rumination than their western peers. However, because the current sample was substantially younger than the samples in previous studies, it may also be that the loss of a parent was generally more unexpected and more emotionally stressful, thus eliciting more rumination. Further studies are needed to examine if this potential cross-cultural difference can be replicated.

Both the Chinese UGRS total and UGRS subscale scores showed strong correlations with prolonged grief symptoms, which replicate findings from the Dutch and English UGRS validation study. The Chinese UGRS total score was moderately correlated with anxiety symptoms, which is similar to findings in the Dutch and English sample. However, the correlation between the overall score on the Chinese UGRS and depressive symptoms was lower than the association found in the Dutch sample ($r = 0.50$, $z = −3.54$, $p < 0.001$) and the English sample ($r = 0.45$, $z = −2.93$, $p = 0.02$). Nevertheless, the correlation pattern still suggested that grief rumination is more strongly related to prolonged grief symptoms than to anxiety and depression symptoms, and thereby supports test-criterion validity of the Chinese UGRS.

Further test-criterion validity evidence was provided by the Chinese UGRS scores positive association with anxiety, depressive, and prolonged grief symptoms, even after controlling for relevant demographic and loss-related variables, trait rumination, and trait mindfulness. Grief rumination was a stronger predictor than trait rumination of all types of mental health symptoms. Similar patterns of results were also reported in the English validation sample (Eisma et al., 2014). Findings suggest that apart from individual differences on the trait tendency to engage in rumination, it is crucial to consider event-related rumination that is elicited by a particular negative life-event, to understand adaptation to such a life event. Because trait rumination—in contrast to grief rumination—also does not seem to longitudinally predict symptoms of psychopathology in bereaved samples (Eisma et al., 2013), it appears critical to address grief rumination when working with bereaved people in clinical practise.

In addition, although trait mindfulness appeared to show stronger associations than grief rumination with symptoms of anxiety and depression, this effect was reversed for prolonged grief symptoms. These findings align with an intervention study by O'Connor, Piet, and Hougaard (2014), which demonstrated that mindfulness-based cognitive therapy succeeded in ameliorating depressive symptoms, but not prolonged grief symptoms. Although mindfulness-based therapy might be helpful in ameliorating postloss depressive symptoms, grief rumination should potentially be targeted using other techniques in order to reduce prolonged grief symptoms (for a review of rumination-focused treatments: Querstret & Cropley, 2013; for an example of effective treatment to reduce grief rumination: Eisma, Boelen, et al., 2015).

It is worth noting that our study was the first to demonstrate a negative correlation between mindfulness and grief rumination and some (but not all) subtypes of grief rumination (i.e., injustice, counterfactuals, and reactions of others). These findings correspond with results from a recent meta-analytic review reporting a negative correlation between mindfulness and rumination (Naragon-Gainey, McMahon, & Chacko, 2017). Higher levels of mindfulness have been related to lower levels of depressive rumination in both an undergraduate student sample (Svendsen, Kvernenes, Wiker, & Dundas, 2017) and a treatment-seeking sample at a mood and anxiety disorder clinic (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013). As people with higher levels of trait mindfulness are more capable to be attentive and aware of experiences in the present (Brown & Ryan, 2003), they may be less likely to be focused on events in the past. However, mindfulness has not consistently been related to all types of rumination. A study amongst college freshmen found that mindfulness was only negatively correlated with the extent to which rumination on sadness was experienced as uncontrollable, not with global levels of rumination on sadness (Raes & Williams, 2010). These results, combined with those of the present study, suggest that the relationship between mindfulness and rumination may differ for various subtypes of rumination. Further exploring the relationship between mindfulness, different forms of rumination, and mental health following bereavement may shed light on what types of ruminative thought and postloss psychopathology can (or cannot) be reduced through mindfulness-based treatments.

This study had a number of limitations. First, our participants were recruited via the Internet and this has affected the representativeness of the sample. Only 50.3% Chinese residents have Internet access and those who use the Internet are generally younger (72.1% of internet-users were aged between 10 and 39; China Internet Network Information Center, 2017), and thus older adults were underrepresented in our sample. For the same reason, the current sample had higher education levels compared with the general Chinese population (National

Bureau of Statistics of China, 2017). Because we did not register how participants were recruited in our online survey, it is unclear to what extent our specific recruitment methods (i.e., announcements on online memorial websites and recruitment in the personal networks of the researcher) additionally impacted on the representativeness of the sample. It is notable that the present sample composition differed from previous samples in UGRS validation studies (Doering et al., 2018; Eisma et al., 2014). In the present study, nearly half of the participants had lost a sibling, whereas in previous validation studies, the largest group of participants had lost a parent. The high proportion of people who lost a sibling may in part result from self-selection bias due to voluntary participation. This self-selection bias may have been exacerbated by the fact that only complete survey responses were included in this study. Possibly, people who experienced less grief rumination were more likely to complete the survey as it may be more taxing for them to fill out all questions.

Second, the study was cross-sectional, precluding the possibility to demonstrate the temporal stability and predictive value of the UGRS. Longitudinal investigations need to be conducted to assess if detrimental effects of grief rumination on postloss mental health demonstrated in Dutch samples (Eisma et al., 2012, 2013; Eisma, Schut, et al., 2015) can be replicated in Chinese samples.

Third, symptom scores instead of clinical interviews were used to assess disturbed grief responses in the current study. To strengthen the criterion validity of the Chinese UGRS, it would be worthwhile to investigate if the Chinese UGRS can discern people with pathological grief from those without. Given that PGD has recently been included in the ICD-11 (WHO, 2018), future research could explore whether the Chinese UGRS yields higher scores in bereaved people with this diagnosis than in non-clinically bereaved people.

Fourth, although the present findings suggest that grief rumination in Western and Chinese bereaved people (at least in part) revolves around similar themes, the current study did not investigate potential differences in rumination between people with different cultural backgrounds. It is notable in this respect that an exploratory study in which Chinese bereaved persons were asked what recurrent thoughts they had experienced after loss suggest some themes of rumination may be more common in Chinese culture (Li & Chow, 2014). For example, participants reported recurrent thoughts about how they could have treated the deceased person better when they were still alive. This potential difference in grief rumination may reflect a stronger tendency in Chinese people to think of themselves in terms of relationships with close others (Cross, Bacon, & Morris, 2000).

Notwithstanding these limitations, the current study provides the first evidence of the Chinese UGRS's reliability and validity. The UGRS could prove to be a useful instrument in research and clinical endeavours to improve our understanding of, and interventions for, rumination and mental health problems experienced by bereaved individuals in China.

## CONFLICT OF INTEREST

Suqin Tang, Maarten C. Eisma, Jie Li, and Amy Y. M. Chow declare that they have no conflict of interest.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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