






Culture-related grief beliefs of Chinese Shidu parents: Development and psychometric properties of a new scale

Guangyuan Shi^a, Jun Wen^a, Xin Xu ^a, Ningning Zhou^a, Jiani Wang ^d, Yuqing Shi^a, Han Liu^{a,b}, Jianping Wang^a and Eva-Maria Stelzer ^c

^aBeijing Key Laboratory of Applied Experimental Psychology, National Demonstration Center for Experimental Psychology Education (Beijing Normal University), Faculty of Psychology, Beijing Normal University, Beijing, P. R. China; ^bStudents Affairs Division, Shanxi University, Shanxi, P. R. China; ^cDepartment of Psychology, University of Arizona, Tucson, AZ, USA; ^dDepartment of Psychology, Queen's University, Kingston, Canada

ABSTRACT

Background: In China, parents whose only-child dies and who have no living or adopted child are called Shidu parents. Negative thinking is assumed to contribute to the development of emotional problems in bereavement. Because grief cognitions are likely influenced by the concepts of Chinese traditional culture (e.g., family continuation), Shidu parents may hold specific culture-related grief beliefs about themselves or the world, which, in turn, could impede their recovery.

Objective: This study developed a questionnaire assessing the culture-related grief beliefs of Shidu parents and examined its psychometric properties.

Methods: This newly developed questionnaire was administered to the combined sample of 313 Shidu parents. Exploratory (n = 164) and confirmatory factor analysis (n = 149) were conducted. Psychometric properties of the questionnaire were evaluated.

Results: Exploratory factor analysis revealed three distinct factors (filial piety belief, destiny belief and perceived stigma), generating a nine-item culture-related grief beliefs of Shidu parents questionnaire (CBSQ). Confirmatory factor analysis verified the three-factor structure ($\chi^2(24) = 39.103$, $p = 0.027$, $\chi^2/df = 1.630$, CFI = .980, TLI = .970, RMSEA = .065, SRMR = .052). Internal consistency and temporal stability were adequate. Convergent, discriminant and concurrent validity were supported.

Conclusions: This study highlights the importance of extending the concept of grief cognitions to include culture-specific beliefs, and provides a first measurement tool to assess culture-related grief beliefs after only-child loss, which can be used in future research with Shidu parents.

Creencias del duelo relacionadas a la cultura en padres Shidu Chinos: Desarrollo y propiedades psicométricas de una nueva escala.

Antecedentes: En China, los padres quienes fallece su único hijo y no tienen hijos vivos o adoptados son llamados padres Shidu. Se asume que el pensamiento negativo contribuye a problemas emocionales en el duelo. Dado que las cogniciones del duelo son probablemente influenciadas por los conceptos de la cultura tradicional China (por ejemplo, continuación de la familia), los padres Shidu pueden mantener creencias del duelo específicas relacionadas a la cultura acerca de sí mismos o el mundo, las cuales, a su vez, podrían impedir su recuperación.

Objetivo: Este estudio desarrolló un cuestionario de evaluación de las creencias del duelo relacionadas a la cultura de los padres Shidu y examinó sus propiedades psicométricas.

Métodos: Este cuestionario recientemente desarrollado fue administrado a la muestra combinada de 313 padres Shidu. Se realizaron análisis factoriales exploratorio (n=164) y confirmatorio (n=149). Se evaluó las propiedades psicométricas del cuestionario.

Resultados: El análisis factorial exploratorio reveló tres factores distintos (creencia de devoción filial, creencia en el destino y estigma percibido), generando un cuestionario de 9 ítems de creencias del duelo relacionadas a la cultura en padres Shidu (CBSQ, por su sigla en inglés). El análisis de factores confirmatorio verificó la estructura de tres factores ($\chi^2(24) = 39.103$, $p = 0.027$, $\chi^2/df = 1.630$, CFI = .980, TLI = .970, RMSEA = .065, SRMR = .052). La consistencia interna y estabilidad temporal fueron adecuadas. Fueron corroboradas la validez convergente, discriminante y concurrente.

Conclusiones: Este estudio destaca la importancia de extender el concepto de cogniciones del duelo para incluir creencias específicas a la cultura, y provee una primera herramienta de medición para evaluar las creencias del duelo específicas a la cultura luego de la pérdida de un hijo único, el que puede ser usado en investigaciones futuras con padres Shidu.

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关键词

失独父母; 丧亲之痛; 哀伤; 丧子; 信念; 哀伤认知; 中国

HIGHLIGHTS

- In China, parents whose only-child dies are called Shidu parents. Negative cognitions are assumed to contribute to the development of emotional problems in bereavement. This study highlights the importance of extending the concept of grief cognitions to include culture-specific beliefs. If cognitive grief theories are correct in assuming a contribution of grief cognitions to the development of maladaptive grief response, modification of culture-related grief beliefs should promote adjustment to loss in Shidu parents.

- This study provides a first measurement tool to assess culture-related grief beliefs after only-child loss, which comprises the three dimensions filial piety belief, destiny belief and perceived stigma. These subscales reflect common culture-related beliefs experienced by Shidu after the loss of their only-child.

- The culture-related grief beliefs of Shidu parents

中国失独父母文化相关的哀伤信念问卷：一个新量表编制和心理测量属性

背景：在中国，失独父母指的是独生子女死亡且没有收养子女的父母。消极的认知会促进丧亲后情绪问题的发生。由于哀伤认知可能会受到中国传统文化观念（如家族延续）的影响，失独父母可能对自己或世界持有文化特异性的哀伤信念，这种信念可能会阻碍他们的康复。

目的：本研究将编制一份问卷评估失独父母的文化相关的哀伤信念，并检验该问卷的信度指标。

方法：使用新开发的调查问卷是对313名失独父母进行调查，进行了探索性（ $n=164$ ）和验证性因子分析（ $n=149$ ），并评估问卷的心理测量属性。

结果：探索性因素分析揭示了三个不同的因素（孝道信念，命运信念和歧视知觉）。最后得到九个题目的考察失独父母与文化相关的哀伤信念的问卷（CBSQ）。验证性因子分析证实了三因子结构（ $\chi^2(24)=39.103$, $p=0.027$, $\chi^2/df=1.630$, $CFI=.980$, $TLI=.970$, $RMSEA=.065$, $SRMR=.052$ ）。内部一致性和时间稳定性都足够好。支持聚合、区分和同时效度。

结论：本研究强调了将哀伤认知的概念扩展到包括特定文化信念的重要性，并提供了第一个评估失独后与文化相关的哀伤信念的测量工具，可用于未来失独父母的研究。

questionnaire (CBSQ) has good reliability and validity in China and can be used for future Shidu research.

1. Introduction

'One child per couple' policy, also known as Only-Child Policy, officially proposed and implemented by the Chinese government in 1980, has created a generation of only-child families, which changed the traditional family structure of millions of Chinese people. When parents experience the death of their only-child, these families receive the label 'Loss-of-only-child family'. According to a definition by the National Health Commission of the People's Republic of China, the term 'loss-of-only-child family' describes a family with parents born after January 1st, 1933, and the mother's age above 49 years whose only biological or legally raised child is dead (Chen, 2013). These parents are also known as Shidu parents in Chinese society. Wang (2013) reported that the number of Shidu families has reached one million in 2010, and it is estimated that the total number of Shidu families will reach ten million by 2050. The death of a child is assumed to be the most painful among different types of losses (Arnold & Gemma, 2008; Arnold, Gemma, & Cushman, 2005). Even more intense grief reactions and higher death rates are reported for parents who have lost their only child compared to parents with remaining children (Li, Precht, Mortensen, & Olsen, 2003) or parents who had given birth again (Yao, Helen, Rebecca, Atsuro, & Jane, 2014). For instance, Shidu parents have higher risks for developing mental health problems including posttraumatic stress disorder, anxiety and depression, as well as physical health constraints, including higher morbidity of chronic diseases and more hospital visits, compared to parents who have not experienced such a loss (Cao, Yang, & Wang, 2018; Yin et al., 2018; Zhou et al., 2018).

Maladaptive cognitions about the loss are believed to play a central role in the development and maintenance of emotional problems after bereavement (Boelen, van Den Hout, & van Den Bout, 2006; Shear, 2015) and may heighten Shidu parents' reactions to loss (He, Tang, Zhu, & Wang, 2014; Xu, 2014). Negative cognitions assumed to underlie maladaptive grief responses include, amongst

others, global negative beliefs about the self ('I am ashamed of myself since my child died'), world ('This world is unjust'), and one's future ('I have a negative view of the future since my child died') (Boelen, van Den Bout, & van Den Hout, 2003; Boelen et al., 2006; Kokou-Kpolou, Megalakaki, & Nieuviarts, 2018; Spuij, Prinzie, & Boelen, 2017). Cognitive behavioral conceptualizations of complicated grief suggest that these cognitions generate negative emotions and cause the mourner to engage in counter-productive strategies to avoid the reality and implications of the loss, thereby impeding emotional processing and adjustment in the long-run (Boelen et al., 2003). For instance, cognitions such as self-blame or guilt ('I did not prevent this death') are positively related to grief severity (He et al., 2014; Li, Stroebe, Chan, & Chow, 2014). Similarly, negative cognitions about responses from others in the aftermath can impact individuals' grief trajectories (Boelen et al., 2003; Burke, Neimeyer, & Mcdevitt-Murphy, 2010). A lack of others who respond in a positive or supportive manner is associated with heightened grief and decreased mental well-being (Stelzer, Flores, & O'Connor, *under review*). Other global beliefs that can hinder adjustment are cognitions individuals hold about the cause of death or the world per se ('This death was predestined. We live in an awful world').

Boelen and Lensvelt-Mulders (2005) developed the Grief Cognitions Questionnaire (GCQ) to assess these problematic cognitions after the death of a loved one. However, the GCQ does not take contextual factors such as the moral codes and concepts of individuals' culture into account when exploring grief cognitions. The importance of a person's cultural context is critical for this topic as different sociocultural norms and values may elicit different grief cognitions. For Shidu parents, losing the only-child is closely related to the Chinese social and cultural background, which in turn can be expected to impact their grief.

For instance, Chinese traditional culture emphasizes the culture of *filial piety*, and places great value on the continuity of the family line (Cheng & Chan, 2006; Zhang & Jia, 2018). Filial piety shows in

different behavior such as respecting ancestors, living (or keeping close) with and taking care of parents, avoiding harming oneself because one's body belongs to one's parents, as well as giving birth to a male heir to carry on the family line (Cheng & Chan, 2006; Li, Liu, & Cao, 1981). The failure to live up to society's expectations to bear a descendant is associated with negative cognitions about oneself such as *self-blame or guilt* (e.g., I should have protected my child), and *perceived stigma* (e.g., I'm different from everyone else) which, in turn, can prolong individuals' grief response, increasing feelings of hopelessness as well as disbelief and inability to accept the child's death (He et al., 2014). The importance of guilt is reflected by the fact that there are over 100 words to describe shame and guilt in the Chinese language (Li, Wang, & Fischer, 2004). Furthermore, death in general and the death of children in particular is a *taboo* in Chinese culture and a topic that is typically avoided and not talked about by Chinese. In addition, the destiny culture is deeply engrained in Chinese culture (He et al., 2014). Shidu parents often identify with other parents who lost their only child as Tong Ming Ren, which means 'those who share the same destiny' (Zheng & Lawson, 2014). Fate and destiny beliefs such as 'Fate comes and gathers, but fate goes and scatters' (Liu, 2011) are common spiritual beliefs of the Chinese stemming from both Confucianism (Steven & Li, 1987), and Buddhism (Guang, 2013).

Given these values and pressures in traditional Chinese culture, it is not surprising that Shidu parents are more likely to endorse negative beliefs about the self, life, world and the future (Chen & Liu, 2016; Cheng, 2013; He et al., 2014). These negative cognitions have been found to exacerbate grief and depressive symptoms (Shi, Xu, Zhou, Wen, & Wang, in preparation), aggravate social avoidance (Chen & Liu, 2016; Cheng, 2013), and in turn impede adaptation (He et al., 2014).

The present study aimed to develop a new self-report measure to assess specific culture-related grief beliefs that may develop after the loss of an only child in Chinese culture. Such a tool can be useful in directing attention to culture-related beliefs in Shidu parents and to further enhance bereavement care and research. In the current study, we defined 'culture-related grief beliefs' as beliefs about the event of losing one's only child held by Shidu parents in the context of Chinese culture. To develop and validate a questionnaire assessing the culture-related grief beliefs of Shidu parents, we first generated and revised an item pool based on review of the literature, key informant interviews with Shidu parents, and consensus discussions with clinical psychologists and research staff. In a next step, a final set of items was selected via exploratory factor analysis (EFA). The factor structure and dimensionality of the final

scale was then tested via confirmatory factor analysis (CFA) in a new sample of Shidu parents. For the CFA, we expected to replicate the factor structure found in the EFA. Lastly, internal consistency, temporal stability as well as convergent, discriminant, and concurrent validity were examined. With respect to convergent validity, we expected positive associations between culture-related grief beliefs and general grief cognitions, since the culture-related grief beliefs of Shidu parents questionnaire (CBSQ) was constructed as a measure of (bereavement-related) negative thinking. With respect to discriminant validity, we expected individuals who qualified for a prolonged grief diagnosis to endorse more maladaptive culture-related grief beliefs compared to individuals without a diagnosis. With respect to concurrent validity, we hypothesized positive associations between culture-related grief beliefs and symptom levels of prolonged grief above and beyond the effects of general grief cognitions.

2. Methods

2.1. Item and scale development

To develop relevant items, we first reviewed existing literature on grief cognitions, only child loss and Shidu parents, and traditional Chinese culture and its view of life and death (especially qualitative research about Shidu parents). In subsequent analyses, we extracted the unique characteristics and descriptions of Shidu parents and the impact of the traditional Chinese cultural background on their grief cognitions. Second, we conducted semi-structured interviews with six Shidu parents to explore the impact of cultural factors on cognitions following only-child loss. Shidu parents who participated in a separate bereavement study in our lab were invited to serve as key informants for the present project. Purposive sampling was employed to identify a diverse set of participants with particular expertise in the research phenomenon (Schutt, 2018). Considering saturation, which refers to a situation in which the addition of new informants no longer provides new information (Chen, 2000), we selected six Shidu parents as key informants (two males, four females; $M_{\text{age}} = 61.33$, $SD = 6.47$). Key informants were on average bereaved for 9.33 years ($SD = 5.13$) and their deceased child (four sons, two daughters) was on average 21.67 years old at the time of death ($SD = 9.20$; range: 7–29 years). All but one key informant (Buddhism) held no religious beliefs. Interviews were analyzed using content analysis, a technique that codes participant narratives in order to identify recurring themes or patterns (Hsieh & Shannon, 2005; Willig, 2013). Based on the literature review and generated themes from the

key informant interviews, we developed an initial set of items to capture various culture-related grief beliefs endorsed by Shidu parents. For example, one key informant shared his belief that the death of his child was due to his own (the parent's) bad destiny, whereas another key informant expressed the view that it was due to the child's bad fate. These participant contributions culminated in the development of items such as 'I lost my child because I have bad luck' or 'I believe people's longevity is predestined'. This initial item pool was then reviewed and modified by seven psychological graduate students, one clinical therapist with expertise in grief, and key informants (e.g., rephrased items, deleted vague and unclear items, and combined items with similar meaning). The final pool of 22-items was designed to capture the following bereavement-related beliefs domains: (1) negative beliefs about the end of one's family lineage, (2) negative beliefs about perceived responses from other people, and (3) cognitions related to beliefs about one's own and one's child's destiny. A six-point scale was used following the response format of the GCQ (Boelen & Lensvelt-Mulders, 2005) (i.e., 1 = very unlikely, 6 = very likely).

2.2. Participants and procedures

Data presented in this manuscript is part of the larger research project 'Constructing a Psychological Aiding System for Chinese Bereaved Parents Who Lost Their Only Child Based on a Population-Based Survey'. Data were collected in four Chinese provinces with the assistance of public interest organizations (e.g., self-help groups). Volunteers in these organizations completed in-person interviews with Shidu parents. Volunteers were trained prior to study begin to ensure rigorous data collection. Inclusion criteria included that the parents had only one biological child and now no living child. The total sample comprised 313 Shidu parents from four Chinese provinces (i.e., four samples). Sample one included 49 participants from Jilin province, sample two included 115 participants from Jiangsu province, sample three comprised 49 participants from Jiangsu province, and sample four contained 100 participants from Shandong province. On average, Shidu parents were 61 years old ($SD = 6.70$) and bereaved for approximately 10 years ($SD = 7.16$). Over two-thirds (72.52%) of the total sample did not expect the death of their adult child ($M_{age}: 25.52$; $SD = 7.95$). Residence of the four samples was diverse with a little over one third living in a village (36.7%), and 52.1% living in a city or a town. The demographic and loss-related information for the four samples as well as the combined sample is shown in Table 1. Group comparisons revealed that the samples differed with regards to sociodemographic- and loss-related

variables which is not surprising due to inherent differences in provinces sampled from (e.g., urban vs. rural setting). Data was collected between April 2017 and January 2018. Written informed consent was obtained prior to data collection. The study received approval from the local ethics committee.

2.3. Measures

In the following, we describe the measures used for the present analyses. However, it is important to note that not all of these measures were completed by all four samples as this study was part of a larger research project (see details in 2.4 data analysis). Table 1 lists descriptive information for psychosocial outcome measures across the four samples.

2.3.1. Socio-demographic and loss-related variables

Socio-demographic variables consisted of gender, education, age, and residence of the Shidu parents. Loss-related variables included cause of death, age and gender of the deceased child, time since loss, and whether the child's death was anticipated or not.

2.3.2. Grief symptoms

Grief symptoms were assessed using the prolonged grief disorder scale (PG-13) (Prigerson et al., 2009). The PG-13 assesses separation distress, cognitive and emotional symptoms (e.g., difficulties accepting the loss, avoidance, bitterness/anger), and functional impairment. Participants rate 11 items on a 5-point Likert scale (1 = not at all or never, 5 = several times a day or always). For current data analysis, the total score was obtained by summing the 11 items capturing the frequency of grief symptoms. We used criteria from Prigerson et al. (2009) to identify potential cases of prolonged grief, which requires endorsement of (a) two items capturing separation distress (criterion B; items 1 and 2), (b) at least five cognitive or emotional symptoms (criterion C; items 3–11), (d) length of bereavement of at least 6 months (criterion D), and (e) significant functional impairment (criterion E). The PG-13 was found to have satisfactory reliability and validity in China (Yi, Gao, Wu, Tang, & Li, 2016), and good internal reliability in the present study ($\alpha = 0.93$).

2.3.3. Grief cognitions

The Grief Cognitions Questionnaire (GCQ) is a 38-item measure of negative, bereavement-related cognitions (Boelen et al., 2003). Items are divided into nine subscales reflecting cognitions related to the self, world, life, future, self-blame, others, appropriateness of grief, cherishing grief, and threatening grief interpretation. Respondents rate their level of agreement with each item on a 6-point scale ranging from 0

Table 1. Socio-demographic and loss-related information and psychosocial outcome measures from participants.

Variables	Total (N = 313)	M (SD) or N (%)				Group comparisons χ^2/F
		Sample 1 (N = 49)	Sample 2 (N = 115)	Sample 3 (N = 49)	Sample 4 (N = 100)	
Shidu parents (N = 313)						
Gender						
Male	129(41.21%)	15(30.61%)	51(44.35%)	25(51.02%)	38(38.00%)	4.798
Female	183(58.47%)	33(67.35%)	64(55.65%)	24(48.98%)	62(62.00%)	
Missing	1(0.3%)	1(2.04%)	0	0	0	
Age (in years)	61.40 ± 6.70	60.05 ± 5.48	63.12 ± 5.73	65.03 ± 8.63	58.41 ± 5.84	16.51***
Time since loss (in years)	9.96 ± 7.16	12.05 ± 8.10	9.92 ± 7.32	11.11 ± 8.11	8.54 ± 5.68	3.043*
Death was anticipated						
Yes	61(19.49%)	5(10.20%)	27(23.48%)	3(6.12%)	26(26.00%)	8.918*
No	227(72.52%)	31(63.27%)	81(70.43%)	41(83.67%)	74(74.00%)	
Missing	25(8.0%)	13(26.53%)	7(6.09%)	5(10.20%)	0	
Education						
Primary school or less	103(32.9%)	41(35.65%)	41(35.65%)	38(77.55%)	24(24.00%)	57.598***
Middle school	137(43.8%)	19(38.78%)	68(59.13%)	2(4.08%)	67(67.00%)	
Undergraduate/Junior college	12(3.8%)	5(4.35%)	5(4.35%)	1(2.04%)	6(6.00%)	
Village	61(19.5%)	1(2.04%)	1(0.87%)	8(16.33%)	3(3.00%)	48.749***
City or town	115(36.7%)	1(2.04%)	33(28.70%)	31(63.27%)	59(59.00%)	
Missing	163(52.1%)	35(71.43%)	69(60%)	10 (20.41%)	39(39.00%)	
Missing	35(11.2%)	13(26.53%)	13(11.30%)	8(16.33%)	1(1.00%)	
Deceased child (N = 313)						
Gender						
Male	232(74.12%)	26(53.06%)	74(64.35%)	46(93.88%)	86(86.00%)	31.903***
Female	76(24.28%)	19(38.78%)	41(35.65%)	2(4.08%)	14(14.00%)	
Missing	5(1.6%)	4(8.16%)	0	1(2.04%)	0	
Age (in years)	25.52 ± 7.95	22.29 ± 8.05	27.72 ± 7.37	27.13 ± 10.0	23.62 ± 6.60	8.354***
Cause of death						
Natural causes	10(3.19%)	7(14.29%)	3(2.61%)	3(6.12%)	3(3.00%)	17.6***
Accident	175(55.91%)	24(48.98%)	81(70.43%)	20(40.82%)	47(47.00%)	
Missing	135(43.13%)	19(38.78%)	34(29.57%)	29(59.18%)	53(53.00%)	
Missing	6(1.92%)	6(12.24%)	0	0	0	
Outcome measures						
PG-13	31.08 ± 10.99	43.16 ± 9.56	20.93 ± 5.7	27.37 ± 7.14	38.64 ± 4.21	213.01***
CBSQ-total	40.92 ± 8.68	40.6 ± 12.72	37.68 ± 6	37.58 ± 7.83	46.43 ± 6.28	26.34***
Filial piety belief	11.15 ± 5.24	13.46 ± 5.63	8.53 ± 3.11	11.09 ± 4.17	13.05 ± 6.11	20.34***
Destiny belief	13.72 ± 3.18	11.92 ± 5.15	13.48 ± 2.49	11.95 ± 2.55	15.75 ± 1.13	31.04***
Perceived stigma	9.96 ± 3.19	9.02 ± 5.5	11.38 ± 2.39	9.14 ± 3.03	9.19 ± 1.63	13.42***
GCOself	20.47 ± 8.91	21.57 ± 10.67		19.38 ± 6.65		1.490
GCOlife	13.84 ± 6.71	14.61 ± 8.16		13.07 ± 4.82		1.290
GCOfuture	17.67 ± 7.94	19.25 ± 9.28		16.1 ± 6.01		3.98*
GCOthreat	14.74 ± 6.34	14.24 ± 7.61		15.25 ± 4.78		.620

PG-13 – Prolonged Grief Questionnaire; GCQ – Grief Cognitions Questionnaire with subscales self, life, future and threatening grief interpretations; * p < .05, ** p < .01, *** p < .001.

(disagree strongly) to 5 (agree strongly). Total scale scores are calculated by summing all items, with higher scores indicating stronger endorsement of the respective negative cognition. The current study used the subscales self (6 items), life (4 items), future (5 items), and threatening grief interpretations (4 items). The GCQ was found to have appropriate reliability and validity in a Chinese bereaved sample (Yu, Wang, He, Xie, & Tang, 2014). The present study is the first one to use the GCQ among Chinese Shidu parents (a manuscript in preparation reports adequate psychometric properties of the Chinese GCQ among bereaved Shidu parents (Shi et al., *in preparation*)). Internal consistency of the four subscales was good in the present study (self: 0.92, life: 0.95, future: 0.93, threatening grief interpretation: 0.91).

2.4. Data analysis

Descriptive statistics were calculated for socio-demographic and loss-related variables, and psychosocial outcome measures. Initially, we conducted an EFA using principal axis factoring (PAF) to explore the factor structure underlying the initial 22-item pool of potential CBSQ items. An oblique rotation was chosen for the PAF analysis as correlations between factors were anticipated (Fabrigar, Wegener, MacCallum, & Strahan, 1999). PAF was chosen over principal component analysis as it estimates factor loadings and factor correlations more realistically while recognizing the existence of random error introduced by measurement (Baglin, 2014). Consequently, PAF is less likely to produce inflated factor loadings or to underestimate factor correlations (Fabrigar et al., 1999). Preliminary descriptive statistics on the 22 items indicated that items of the CBSQ were normally distributed. In a second step, we conducted three CFAs using maximum likelihood estimation to evaluate the latent structure of the subset of items that resulted from the EFA in step one. Here, a model with three correlated factors was compared to a model with three independent factors. In addition, a bifactor model was tested to establish whether a general factor exists in the CBSQ. The variance of each factor was fixed to 1.0. All factor loadings were freely estimated. To evaluate goodness of fit, multiple indices were examined since each individual fit index is subject to limitations. Model fit was considered good (acceptable) if the Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) were greater than or equal to 0.95 (0.90) (Brown, 2015), the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) were less than or equal to 0.05 (0.08) (Kline, 2011), and the ratio of χ^2 to degrees of freedom (χ^2/df) were below 2 (5) (Schumacker & Lomax, 2004). The Akaike Information Criterion (AIC) was used to compare models, with lower AIC values indicating better fit. Prior to

conducting the CFA, we assessed the multivariate normality of the CBSQ which was not violated. Descriptive analyses and EFA were conducted in SPSS version 22.0. Mplus 7.0 was used for CFAs.

Internal and temporal stability of the CBSQ was evaluated by investigating Cronbach's alphas and test-retest correlation coefficients (Pearson correlation). To test for convergent validity, zero-order correlations were computed between culture-related grief beliefs and general grief cognitions. To test for discriminant validity, we compared CBSQ scores of potential candidates for prolonged grief with non-candidates for such as diagnosis using a two-sample t-test. Concurrent validity of culture-related grief beliefs was tested via hierarchical multiple regression analysis. In a first step, we entered relevant socio-demographic and loss-related variables before adding the sum score resulting from four types of grief cognitions in step two. In step three, the CBSQ total score was added to test whether culture-related grief beliefs predicted symptoms levels of prolonged grief above and beyond general grief cognitions. An α of 0.05 was employed for all tests. As previously mentioned, not all measures were collected across the four samples (i.e., GCQ was only measured in samples 1 and 3). Data from samples one and two were utilized in the EFA ($n = 164$), data from samples three and four were used for the CFAs ($n = 149$). Analyses involving the GCQ (i.e. convergent and concurrent validity) were computed on samples one and three. The combined sample was used for reliability analyses and to test for discriminant validity.

3. Results

3.1. Exploratory factor analysis

In exploring the latent factor structure of the initial CBSQ items, an EFA was conducted using PAF. Oblique rotation was chosen for the PAF analysis as correlations between factors were anticipated. The Kaiser-Meyer-Olkin Measure of Sampling Accuracy was equal to 0.745, indicating an adequate sample size for factor analysis. Bartlett's test of sphericity was also significant ($p < .001$). The EFA on the original 22 items revealed three factors based on the scree plot and eigenvalues greater than one. To improve interpretability, we removed several items that failed to load at least 0.45 on any single factor, or had cross-loadings above 0.45 among factors (difference between two loadings of less than 0.2).

The final EFA involved 9 items and again revealed three factors. This solution accounted for 65.56% of the total variance. Factor loadings are shown in Table 2. Factor one, 'filial piety belief' reflects traditional Chinese beliefs about the importance of continuing the family heritage, and passing down the family lineage

Table 2. The factor loadings of CBSQ items, explained variance of factors, and correlations among factors (sample size: N = 164).

Item #	Factor loadings		
	Filial piety belief	Destiny belief	Perceived stigma
The loss of my child is the end of my family line. 失去孩子意味着自己断代了。	0.971		
The blood line is not carried on, I am sorry to my parents. 我觉得没有把血脉传承下去，所以觉得对不起我的父母。	0.880		
The ancestral line ended because I lost my child. 失去孩子意味着家族的香火终结了。	0.863		
I lost my child because I have bad luck. 失去孩子是因为我倒霉。		0.852	
God decides about our (my child's and my) fate. 孩子和我的缘分是老天定的。		0.762	
I believe people's longevity is predestined. 我觉得人的寿命都是注定的。		0.586	
Parents who have lost their only child are a special group, others will not want to have contact with us. 失独父母是一个特殊的群体，别人不会想接触我们。			0.917
After losing my child, others will treat me like an outcast. 失去孩子后，我觉得别人会把我当成异类。			0.726
I am unable to integrate into society due to my special identity as a parent who lost his/her only child. 由于我的身份（失独父母），我无法再融入社会。			0.462
Explained variance	32.73%	20.18%	12.65%
Correlations between CBSQ factors			
Filial piety belief			
Destiny belief	0.067		
Perceived stigma	0.256**	0.304**	

Pearson correlation coefficients presented; * $p < .05$, ** $p < .01$.

(e.g., 'Loss of the child means the end of my family's lineage'); Factor two reflects the belief that one's fate and destiny is predetermined (e.g., 'I feel like people's longevity is destined.'). which was labeled 'destiny belief'; Factor three reflects the perceived stigma given the Chinese culture background experienced by families who lost their only-child (e.g., 'After losing my child, others will treat me like an outcast'), and is labeled 'perceived stigma'. Pearson correlation coefficients between the three factors are shown in Table 2.

3.2. Confirmatory factor analysis

In a next step, we conducted three CFAs using maximum likelihood estimation to evaluate the latent structure of the subset of items that resulted from the EFA. At first, a single order three-factor model was tested in which the items were fixed to load on the three factors that they were originally assumed to represent (based on the EFA). To test whether the three factors represented independent or interrelated culture-related grief beliefs, we compared a model with three orthogonal factors to a model with correlated factors. As shown in Table 3, the three-factor model with correlated factors (e.g., CFI = .981, TLI = .970, RMSEA = .065, SRMR = .052, AIC = 3606.02) fit the data better than the model with orthogonal factors

(e.g., CFI = .961, TLI = .948, RMSEA = .085, SRMR = .120, AIC = 3616.73). To verify whether a general factor exists, a bifactor model was conducted in addition to the one-order solutions. Model fit indices suggested that a three-factor model with correlated factors was superior to a bifactorial model (e.g., CFI = .982, TLI = .964, RMSEA = .071, SRMR = .095, AIC = 3610.311).

3.3. Convergent and discriminant validity

As hypothesized, the total score of culture-related grief beliefs was positively related to negative cognitions about the self, life, future and threatening grief interpretations ($r = .50-.64$; Table 4), thus confirming convergent validity. Furthermore, the three CBSQ subscales (filial piety belief, destiny belief and perceived stigma) were significantly positively related to all three grief cognitions (GCQ) subscales ($r = .21-.70$).

In support of discriminant validity, the CBSQ was found to distinguish groups that generally report greater symptom levels of prolonged grief after the death of a loved one. We found that Shidu parents in the prolonged grief group (N = 68, M = 38.73, SD = 9.40) endorsed greater culture-related grief beliefs compared to the non-prolonged grief group

Table 3. Confirmatory factor analyses of the CBSQ: overall model fit.

	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR	AIC
Three-factor model with uncorrelated factors	55.817	27	2.07	0.961	0.948	0.085	0.120	3616.733
Three-factor model with correlated factors	39.103	24	1.63	0.980	0.970	0.065	0.052	3606.019
Bifactor model	31.394	18	1.77	0.982	0.964	0.071	0.095	3610.311

CFI – Comparative Fit Index; TLI – Tucker Lewis Index; RMSEA – Root Mean Square Error of Approximation; SRMR – the Standardized Root Mean Square Residual; AIC – Akaike Information Criterion.

Table 4. Correlations between CBSQ and other constructs.

	Filial piety belief	Destiny belief	Perceived stigma	Total score CBSQ
GQC	.474**	.277**	.649**	.631**
Self	.460**	.273**	.696**	.644**
Life	.484**	.214*	.602**	.591**
Future	.454**	.289**	.446**	.538**
Threatening	.303**	.213*	.606**	.501**
PG-13	.378**	.242**	-.045	.331**

GQC – Grief Cognitions Questionnaire with subscales self, life, future and threatening grief interpretations; PG-13 – Prolonged Grief Questionnaire; Pearson correlation coefficients presented; * $p < .05$, ** $p < .01$.

($N = 240$, $M = 34.19$, $SD = 7.31$), $t(1,307) = 3.936$, $p < .001$.

3.4. Concurrent validity

Hierarchical multiple regression analysis on prolonged grief symptoms supported the concurrent validity of the CBSQ (see Table 5). Entering sociodemographic and loss-related variables in step 1 explained 29% of the variance in prolonged grief symptoms [$F(5,75) = 6.127$; $p < 0.001$, adjusted $R^2 = .290$]. Adding general grief cognitions in step two predicted a significant amount of additional variance in prolonged grief symptoms compared to the previous step ($\Delta R^2 = 24.5\%$, $p < .001$). A significant increase in adjusted variance explained also emerged when adding culture-related grief beliefs of Shidu parents in step three ($\Delta R^2 = 4.3\%$, $p = .008$). Thus, the CBSQ concurrently predicted symptoms of prolonged grief over and above relevant sociodemographic, loss-related variables and general grief cognitions in Shidu parents [$F(7, 73) = 14.295$, $p < 0.001$, adjusted $R^2 = 0.578$].

3.5. Reliability analysis

Cronbach's alphas ranged from 0.76–0.95 (filial piety belief, 0.95; destiny belief, 0.79; perceived stigma, 0.77; total scale, 0.76), suggesting appropriate to excellent internal consistency in the CBSQ. In addition, we found good test-retest reliability one month later in a randomly selected sample of 35 subjects from sample four. Test-retest reliability coefficients (Pearson correlation coefficients) of the CBSQ ranged from 0.69 to 0.91 (filial piety belief, 0.91; destiny belief, 0.69; perceived

stigma, 0.78; total scale, 0.88). The reliability of the CBSQ was further supported by the item-total correlations. All item-total correlations were high and significant ($r = .37$ – $.80$). In addition, item scores were positively correlated with the subscales they belonged to. High correlations between items and the total score were found for the subscales filial piety belief ($r = .93$ – $.97$), destiny belief ($r = .81$ – $.85$), and perceived stigma ($r = .79$ – $.85$).

4. Discussion

The present study tested the psychometric properties of a newly developed self-report measure which assesses culture-related grief beliefs of parents who lost their only child in China and are unable to conceive or adopt another child. This new measure aims to enhance knowledge about maladaptive thinking patterns in Shidu parents by extending general grief cognitions to include culture-relevant items. The CBSQ was developed based on existing literature and key informant interviews, and was designed to measure grief-related beliefs assumed to contribute to adjustment problems post loss. Validity and reliability analyses confirmed the psychometric properties of the CBSQ.

An EFA reduced the initial pool of 22 items to 9 items, and showed that beliefs clustered into three factors representing filial piety belief, destiny belief, and perceived stigma. The 13 items which were excluded either had low factor loadings, or had high factor loadings on multiple factors. For example, 'The pain and experience of parents who lost their only child will never be understood by other people' had low loadings across factors. 'I believe other people think it brings bad luck to talk about a child's death' had high loadings on both filial piety belief and perceived stigma. Results from a subsequent CFA verified the correlated three-factor model.

These final three factors are consistent with traditional Chinese culture, and reflect core Chinese values and concepts. First, Chinese culture is collectivistic, emphasizing the interests of the family and the community, and putting great importance on the belief of filial piety culture. Mencius has put forward a saying that 'there are three unfilial acts, bearing no descendant is by far the most unforgivable' (Bao,

Table 5. Predictive value of the CBSQ for prolonged grief symptoms after controlling for relevant sociodemographic, loss-related variables and grief cognitions.

	$N = 80$	adjusted R^2	ΔR^2	β
PG-13 total scores				
Block 1		0.29		
Gender of Shidu parents				0.262**
Age of Shidu parents				-0.278
Gender of deceased child				0.04
Age of deceased child				-0.273
Time since loss				-0.044
Block 2		0.535***	0.245***	0.529***
Block 3		0.578**	0.043**	0.262**

GQC-total – Grief Cognitions Questionnaire total score. CBSQ-total – Culture-related Grief Beliefs of Shidu parents Questionnaire total score. * $p < .05$, ** $p < .01$, *** $p < .001$.

2012; Li et al., 1981; Xu & Peng, 2017). ‘No offspring’ means the end of ancestor’s inheritance and family life in a sense, which is considered the most treacherous behavior in Chinese traditional culture (Ikels, 2004; Li et al., 1981; Whyte, 1997). Second, destiny belief refers to the idea that life and fate are predestined. Destiny beliefs are part of Chinese traditional culture and come from Confucianism and Buddhism. In numerous interviews with Shidu parents, most of them had difficulties accepting the loss and considered the death of their children as punishment from God or destiny, which evoked the feeling of helplessness and guilt (He et al., 2014). Such threatening feelings of helplessness and guilt can prevent an integration of the death into existing meaning structures and thereby hinder adjustment to loss (Chen & Liu, 2016). Lastly, stigma refers to stereotypes about a group of people and stems from ‘poorly justified knowledge structures that lead to discrimination’ (Corrigan & Penn, 1999). Death is considered as taboo in Chinese society (Yang & Chen, 2002), and most Chinese avoid talking about it unless absolutely necessary (Hsu, O’Connor, & Lee, 2009). For Shidu parents, the death of their only child truly means ‘without offspring’. Given the pressure to continue the family lineage, the death of an only child necessarily comes with social stigma (He et al., 2014).

With regard to the intercorrelations among CBSQ factors, the low, nonsignificant correlations between filial piety and destiny beliefs were surprising. On the one hand, item level characteristics and statistical considerations might account for the low correlations. First, we treated scale items as interval variables and calculated Pearson correlations. Research suggests that when observed variables differ in their distribution shapes, traditional methods underestimate their relationship (Goodwin & Leech, 2006). In our sample, destiny beliefs were more skewed compared to filial piety beliefs, which may contribute to the low correlation between both factors. In addition, we used a comparatively small sample for EFA ($n = 164$) which is associated with greater measurement error and lower correlation estimates (Chen & Popovich, 2002). On the other hand, the low correlations indicate that filial piety and destiny beliefs are independent constructs. As mentioned previously, filial piety beliefs come from traditional Chinese Confucian culture which emphasizes the societal value of continuing the family line (Cheng & Chan, 2006; Zhang & Jia, 2018). Destiny beliefs, in contrast, mainly originate in Buddhism and Confucianism, reflecting Shidu parents’ own view of their and their children’s destiny rather than societal expectations per se. Overall, we know too little how different culture-related beliefs relate to each other, which should be explored in future studies.

Validity analyses showed that culture-related grief beliefs (e.g., ‘Parents who have lost their only child are a special group, others will not want to have contact with us’) were positively related to prolonged grief and other negative cognitions (e.g., ‘I am ashamed of myself since my child died’). Specifically, Shidu parents who qualified for a prolonged grief diagnosis endorsed higher levels of culture-related beliefs compared to individuals without a diagnosis. These results are consistent with previous studies (Boelen et al., 2003; Kokou-Kpolou et al., 2018) and existing cognitive conceptualizations of grief which associate adjustment problems after loss to negative cognitions (Boelen, van Den Bout, & van Den Hout, 2006).

The present findings extend existing research on grief cognitions by highlighting the impact of cultural values and beliefs. Researchers have argued that culture-related grief beliefs of filial piety, destiny, and perceived stigma are associated with greater levels of depression, anxiety and grief severity in Shidu parents, thereby impeding positive adaptation (Chen & Liu, 2016; Cheng, 2013; He et al., 2014). Our findings parallel these results by showing that interpretations of child loss as the end of one’s family’s lineage, fate by God, or stigmatizing experience are important cognitive correlates of grief impairment. These culture-related cognitions are likely to contribute to maladjustment either directly, by causing heightened psychological distress, or indirectly, by causing the mourner to engage in maladaptive avoidance strategies which, in turn, create an increase in symptom levels (Boelen et al., 2003; Ehlers & Clark, 2000). Such an indirect effect could account for the non-correlation between perceived stigma and symptoms of prolonged grief. For example, a Shidu parent, who believes that others will look down on him due to the loss (perceived stigma) may withdraw from social contacts, thereby preventing himself from opportunities to share his grief and to cope (Chen & Liu, 2016). In this case, perceived stigma would not directly exert its influence on mental health outcomes but indirectly via other pathways such as social support. Research indeed suggests that perceived stigma undermines individuals’ systems of social support (Chen & Liu, 2016; Fielden, 2010; Young et al., 2012). Lack of social support, in turn, negatively impacts individuals’ overall mental health (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015), but not always their grief (Burke et al., 2010). In addition, this lack of association between perceived stigma and grief corroborates recent research on stigma and bereavement which suggests that perceived stigma is related to heightened depression but not grief (Scocco et al., 2019).

Similarly, the threatening interpretation that the death of a child means the end of the family lineage may diminish confidence in one’s coping abilities,

thereby avoiding confrontation of loss reminders and opportunities to integrate the loss into existing autobiographical memory structures. Correlations between the CBSQ subscales and subscales of the GCQ and PG-13 highlight these links. For example, grief beliefs related to filial piety were strongly related to negative beliefs about the self, which may contribute to a diminished confidence in one's coping abilities, and consequently cause feelings of inferiority and helplessness (Zheng & Lawson, 2014). Stigmatizing perceptions and beliefs about destiny were related to negative beliefs about the self, life, future, and threatening grief interpretations. Stronger correlations between destiny beliefs and the GCQ subscales 'self' ('I am ashamed of myself, since __ died') and 'future' (e.g. 'I don't expect that I will feel better in the future') suggest that for Shidu parents, beliefs about fate, bad luck, and predestined lifepaths come with a sense of blame, personal failure and hopelessness but are less strongly related to individuals' worries about appropriate grief expression or lack of emotional control. Surprising were the low correlations between destiny beliefs and the GCQ 'life' subscale (eg 'My life is meaningless, since __ died') given that both cognitions capture individuals' worldviews. It could be that for Chinese Shidu parents, the death of their child evokes a sense of inferiority and hopelessness but that this sense of meaninglessness does not generalize into all areas of their lives. Overall, this corroborates findings from Chinese scholars that destiny beliefs are associated with feelings of self-blame and hopelessness which hinder Shidu parents positive adjustment to loss (He et al., 2014; Xu & Li, 2016). Filial piety and destiny beliefs may contribute to a stigmatized personal and social identity because the loss of an only child is considered a mark of bad luck, failure, shame or even guilt, tainting the self in the eyes of others, and leading to estrangement and social withdrawal (Goffman, 1963).

4.1. Clinical implications

The current findings also have clinical implications. If cognitive grief theories are correct in assuming a contribution of grief cognitions to the development of maladaptive grief trajectories, modification of culture-related grief beliefs should promote adjustment to loss in Shidu parents. Based on the present findings, cognitive therapy after only-child loss should then not only target general grief cognitions identified in previous research (Boelen et al., 2003, 2006; Ehlers & Clark, 2000), but should be extended to include specific culture-related grief beliefs. Interventions aimed at testing the validity of and diminishing such beliefs can help specify the role of culture-specific beliefs after only-child loss and may ameliorate distress in Shidu parents. On the one hand, research evidence suggests that Shidu parents benefit from abandoning culture-related beliefs and

values. For instance, Zhang and Jia (2018) reported that some Shidu parents deliberately abandon aspects of familism culture following the death of their child even though they were clear about the societal obligations and expectations associated with it. According to the authors, renouncing filial piety concepts decreased pressure for Shidu parents, and may be an effective way of reducing distress. At the same time, caution is warranted when trying to change Shidu parents' cognitions, especially since these beliefs reflect long-held culturally transmitted values and beliefs. Beliefs regarding filial piety and destiny, for instance, are deeply engrained in Chinese culture. Instead of modifying cognitions, acknowledging and validating beliefs and concerns may constitute a more culturally-sensitive approach to decrease distress. Clinicians can help Shidu parents validate their beliefs by providing a space to identify their grief-related cognitions and clarify their fundamental values, helping them form supportive relationships with other Shidu parents who share their experience ('Tong Ming Ren'), or via evidence-based therapeutic approaches such as acceptance and commitment therapy (Hayes, 2004). The CBSQ is a promising measure to help identify these cognitions in the first place.

4.2. Limitations and future directions

Despite the large combined sample ($N = 313$) we acknowledge that the sample size may be considered small when conducting EFAs and CFAs. Furthermore, difference tests between samples suggest that our samples differed with regard to sociodemographic and loss-related aspects (e.g., age, cause of death) as well as outcome variables (e.g., prolonged grief symptoms, strength of culture-related grief beliefs). These differences between samples (e.g., sample size, sociodemographic and loss variables) could have significantly impacted our results obtained in EFA and CFA. Future research should explore to what extent sample characteristics are related to culture-related beliefs (e.g., violent and non-violent loss, time since loss) and whether results can be generalized across Shidu parents. Another limitation is the cross-sectional design which prevents us from drawing any causal conclusions. Future research should employ prospective, longitudinal designs to assess the development of culture-related grief beliefs across time and to test whether culture-related grief beliefs contribute to the development of maladaptive grief responses (mediation and moderation analysis). Nevertheless, this was the first study to develop and assess the psychometric properties of the CBSQ which can now be used in future research with Shidu parents. Besides exploring maladaptive correlates of culture-related grief beliefs in Shidu parents, future research would benefit from

examining relationships between cultural beliefs of Shidu parents and variables such as posttraumatic growth, continuing bonds, or positive culture-related appraisals of loss to help us understand the role of culture-related belief in models of grief and recovery. In addition, it would be interesting to assess whether culture-related grief beliefs experienced by Shidu parents are shared by non-bereaved individuals in China (e.g., perceptions that Shidu parents are a 'special' social group due to their loss), individuals who have experienced other types of loss (e.g., death of a romantic partner, death of a sibling), as well as survivors of loss from other cultural contexts. Such comparisons could be used to further establish the validity of the newly developed CBSQ, and shed light on the potential uniqueness of grief-related beliefs in Chinese Shidu parents. For example, fear of stigma is commonly reported following the death of a loved one (Hanschmidt, Lehnig, Riedel-Heller, & Kersting, 2016; Riggs, Due, & Tape, 2018). Future research could assess to what extent perceived stigma items of the CBSQ are indeed specific to the Chinese culture. As such, it could be that perceived stigma is just as common among bereaved parents from other cultural contexts. Nevertheless, we believe that fear of stigma will be more pronounced among Chinese Shidu parents given the various societal pressures outlined in the manuscript. For instance, Xu and Peng (2017) suggest that the experience of only child loss is a collective cultural trauma which is portrayed and maintained by public media. Chinese public media displays a tragic image of Shidu parents and the difficulties they face as they age (e.g., medical, social isolation), which reinforces a sense of 'outcasts' and 'stigma' among survivors and the general public. This perceived social identity threat is also reflected in the items comprising the perceived stigma CBSQ subscale ('will be treated as an outsider, a special group'). In contrast, other grief scales assess stigmatizing reactions more broadly using items such as 'others did not want to talk about the death' (e.g., see Grief Experience Questionnaire; Bailley, Dunham, & Kral, 2000) targeting unsupportive behavior from others (vs. social identity threat). Exploring the cultural specificity (vs. global universality) of such concepts will be an important task for future research.

5. Conclusion

The CBSQ is a psychometrically sound measure which comprises the three dimensions filial piety belief, destiny belief and perceived stigma. These subscales reflect common culture-related beliefs experienced by Shidu parents after the loss of their only-child. Strong associations were found between cultural-related beliefs of Shidu parents and grief intensity, suggesting that negative cognitions contribute to the development and

maintenance of emotional problems in bereavement. The CBSQ has shown good reliability and validity in four samples of Chinese Shidu parents and can be used for future Shidu research.

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ORCID

Xin Xu  <http://orcid.org/0000-0002-8554-4650>

Jiani Wang  <http://orcid.org/0000-0002-0768-4447>

Eva-Maria Stelzer  <http://orcid.org/0000-0002-3589-8602>

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