Prolonged grief disorder symptoms and posttraumatic growth among Chinese shidu parents: A latent transition analysis

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Abstract

Objective: Chinese shidu parents (bereaved parents who have lost the only child) may experience prolonged grief disorder (PGD), as well as posttraumatic growth (PTG). This study aimed to examine their latent classes and transition patterns of PGD symptoms and PTG.

Methods: Based on a longitudinal design, 265 shidu parents completed the Prolonged Grief Scale-Revised and Short Form of Posttraumatic Growth Inventory for Chinese Shidu Parents twice with an interval of about 5 months. Latent class analysis (LCA) and latent transition analysis (LTA) were performed to identify subgroups and their transition possibilities over time.

Results: Four latent classes that changed over time were identified: a 'Growth' class, a 'Combined Grief and Growth' class, a 'Low Grief' class and a 'High Grief' class. From Time 1 to Time 2, the proportion of the growth class and the low grief class increased. Shidu parents in the growth class or combined class had about a 36% probability of moving to low grief class. Compared with individuals in the high grief class (8.5%), members in the low grief class (20.4%) had a higher probability of moving to the growth class. Moreover, 29.0% of shidu parents suffered from persistent grief.

Conclusions: Adjustment to child-loss displayed substantial variations between individuals. PTG reported by shidu parents can be both stable and temporary. About thirty percent of shidu parents suffered from persistent and severe grief, and designing grief-focused treatment may be beneficial for them.

Keywords: Shidu parents, prolonged grief disorder, posttraumatic growth, latent class

analysis, latent transition analysis.

Clinical Impact Statement

This study suggests that there are four distinct subgroups of shidu parents based on their endorsement of PGD symptoms and positive changes, which could provide a detailed and dynamic information regarding bereavement outcomes of shidu parents. Although longer time since loss might allow greater potential for personal growth, the self-reported PTG may contain component of both stable and temporary growth. Additionally, nearly thirty percent of shidu parents suffered from frequent and intense grief. Timely screening and targeted treatments are encouraged for them, especially shidu parents in the high grief class.

Grief is a common, universal reaction to losing a loved one. However, a minority of bereaved people will go on to experience severe, persistent grief, recently recognized as prolonged grief disorder (PGD; Prigerson et al., 2021; Smith & Ehlers, 2020). PGD is a new diagnosis that has been officially included in the International Classification of Disease (ICD-11; World Health Organization, 2018), and the Diagnostic and Statistical Manual of Mental Disorders, fifth edition, text revision (DSM-5-TR; American Psychiatric Association, 2022). It is characterized by longing/yearning for the deceased and/or frequently distracting thoughts of them and/or their death, accompanied by intense emotional pain (Prigerson et al., 2021). The inclusion in these diagnostic manuals contributes to the global study of this new condition, which promotes PGD to greater theoretical and clinical importance. It also fosters the identification and the provision of targeted care for bereaved individuals needing help following loss (Reed et al., 2022).

There is evidence to suggest that losing a child results in the highest rates of PGD (Buur et al., 2023; Smith & Ehlers, 2020). Research has shown that parents who lose their only child, particularly those from cultures where it is expected that children will care for their elderly parents and where continuing the bloodline through child-rearing is emphasized, are especially at risk of developing PGD (Yuan et al., 2024). These parents, often referred to as "shidu parents", face unique societal and cultural pressures that exacerbate their grief (Zheng et al., 2017). The widely used definition of "shidu parents" in the literature is bereaved parents aged 49 years or older who lost their only child and currently have no other living biological or adopted children (Xu et al., 2022; Zhou et al., 2020). The prevalence of PGD in the general population is around 10% (Lundorff et al., 2017), while rate among Chinese shidu parents has been reported as high as 35.5% according to ICD-11 PGD criteria (Zhou et al., 2020). Significant difficulties have been reported up to a decade later. Specifically, 62.4% of shidu parents still experienced daily longing or yearning, 40.9% reported daily emotional pain (Zhang et al., 2020), and about one-third suffered significant functional impairment due to their grief (Xu et al., 2022; Zhou et al., 2020). A recent meta-analysis study suggested that 75.0% of shidu parents presented with PGD symptoms (Yuan et al., 2022). Due to the 'one child per couple' policy implemented between 1979 and 2015, the number of shidu parents is expected to reach around 4.5 million by 2050 (Wang, 2016). Therefore, there is an urgent need to learn more about their bereavement outcomes so that targeted interventions can be developed.

While negative psychological effects are common in this population, research has also observed positive psychological changes, known as posttraumatic growth (PTG) (Tedeschi & Calhoun, 1996; Xu et al., 2021). For example, facing and adapting to such catastrophic trauma

may strengthen shidu parents' ability to accept life's challenges and foster resilience in the face of struggle. Additionally, processing and understanding one's own grief may enhance empathy towards others' pain, creating closer relationships. Studying PTG helps researchers understand how individuals find new meaning and grow through grief, which can inform therapeutic approaches, and enhance overall mental health outcomes (Zoellner & Maercker, 2006).

A Model of Growth in Grief posits that the death event challenges ones' assumptive world beliefs, which leads not only to distress but also to growth (Calhoun et al., 2010). Therefore, after losing a loved one, PGD symptoms and PTG can, and often do co-occur together (Bellet et al., 2018). However, research on the relationship between grief and PTG has produced inconsistent results. Some studies have found negative relationships (Engelkemeyer & Marwit, 2008), others positive relationships (Klurfeld et al., 2020), curvilinear relationships (Qian et al., 2022), or no relationship at all (Xu et al., 2020). These conflicting findings may partly be due to the fact that adjustment patterns after loss can vary substantially between individuals (Smith & Ehlers, 2020). One approach that accounts for between person variation is called latent class analysis (LCA). LCA classifies individuals in subgroups based on the probability that their responding on a set of variables looks more like a particular group or 'class' than the rest of the population sampled (Collins & Lanza, 2010). In a study of PGD and PTG in widows, Kokou-Kpolou and colleagues (2022) found three classes: a combined grief/growth class (32.6%), a predominantly growth class (36.6%) and a low-medium growth class (30.9%). A study in a community sample with varying loss types also supported a similar three class solution (combined grief/growth class: 21.7%, growth class: 40.0%, and a resilient class: 38.3%) (Zhou et al., 2018). The results of LCA studies allow for a more nuanced understanding of

bereavement responses by identifying subgroups of individuals who may have specific needs which may point to specific interventions (Howard & Hoffman, 2018). Furthermore, by identifying correlates of these subgroups researchers are better able to predict those at particular risk for PGD and who might exhibit PTG. However, the characteristics of subgroups distinguished in terms of both negative and positive psychological outcomes remains unknown among shidu parents.

Given that latent class membership may be dynamic, it is important and meaningful to explore how individuals move between latent classes over time. Latent transition analysis (LTA), the longitudinal extension of LCA, can be used to estimate the probabilities of stability and transition of subgroups over time (Collins & Lanza, 2010). Generally, the manifestations and temporal evolution of grief are variable and unique to each loss (Shear, 2015). Furthermore, bereaved parents may need some time to make sense of death and gain actual positive changes (Helgeson et al., 2006; Waugh et al., 2018). Therefore, exploring the change patterns of PGD-PTG classes over time has the potential to provide important information on the adjustment patterns of shidu parents.

Therefore, the current study, adopting a longitudinal design, mainly aimed to identify subgroups of shidu parents based on their endorsement of PGD symptoms and PTG, and investigate the change patterns of the subgroup memberships over time.

Method

Participants and procedures

With the help of local Family Planning Associations and public welfare organizations, shidu parents in the northeast and southeast regions were recruited using a convenient sampling

method. The research was approved by the Ethics Committee of [MASKED FOR REVIEW]. Participants voluntarily participated in the survey and were compensated approximately 300 yuan for completing the questionnaires twice. Written informed consent was obtained before the first data collection.

During July to August 2021 (Time 1), 280 participants completed the questionnaire package. Due to the impact of the COVID-19 pandemic and in order to avoid the Lunar New Year, the second data collection (Time 2) happened 5-months later. At Time 2, 15 people dropped out of the study. There were no significant differences in socio-demographic and loss-related variables between the parents who completed the survey (N = 265) and those who did not respond (n = 15). There were no significant differences in scores of PGD (mean values 28.78 vs 24.43, p = .11) and PTG (mean values 25.94 vs 27.67, p = .44) either. For further sample characteristics please refer to Table 1 in Supplementary materials.

The final sample included 162 females (61.1%) and 103 males (38.9%), with the mean age was 62.62 years (SD = 6.56). Approximately a third of participants (n = 95, 35.8%) were educated to a primary school level, 102 (38.5%) finished middle school and 68 (25.7%) had a secondary school level or higher. Most of them (81.1%) had a partner and about a half of them (54.3%) had a grandchild. The majority of participants (71.7%) experienced a non-violent death. At baseline, the average bereavement length was 31.66 months (SD = 17.35).

Measures

Demographic questionnaire

Demographic information (including gender, age, marital status and education level) and loss-related information (e.g., cause of death and length of bereavement) were collected by a

self-report questionnaire.

Prolonged Grief Scale-Revised (PG-13-R)

The Prolonged Grief Scale-13 is one of the most commonly used tool to evaluate grief severity (Prigerson et al., 2009). The current study used its revised version (PG-13-R), which corresponds to the PGD criteria in DSM-5-TR (Prigerson et al., 2021). Ten items were used to evaluate the severity of PGD symptoms within the recent month on a 5-point Likert scale (1 = not at all, 5 = overwhelmingly), such as, "do you feel yourself longing or yearning for the person who died". Generally, a symptom was considered to be "present" when it was rated as 4 (quite a bit) or 5 (overwhelmingly) (Boelen, Lenferink, et al., 2019; Zhou et al., 2020), and "absent" when rated below 4. In this study, the Cronbach's α coefficients of the PG-13-R at two time points were .93 and .95, respectively.

Short Form of Posttraumatic Growth Inventory for Chinese Shidu Parents (PTGI-CS-SF)

Based on the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), Xu et al., (2021) developed the PTGI-CS-SF. It consists of 9 items in three dimensions: philosophy of life (e.g., My priorities about what is important in life have changed after losing my child), change in self (e.g., I feel more self-reliance) and relationships with others (e.g., A sense of closeness with others). Participants rated each item from 1 (I didn't experience any of this change) to 6 (I experienced a lot of this change) according to their perceived changes in the last month. Following previous studies (Kokou-Kpolou et al., 2022; Zhou et al., 2018), a score of 4 (moderate changes), 5 (much changes) or 6 (a lot of changes) was considered as the presence of the positive changes. Otherwise, it was deemed to be absent. The Cronbach's α coefficients of the PTGI-CS-SF in this study were Time 1 α =.86 and Time 2 α =.90.

Data analysis

The maximum percentage of missing values was 0.8% at Time 1 and 0.4% at Time 2. The results of Little's MCAR test showed that the data were missing completely at random (Time 1: χ^2 [42] = 48.89, p = .22; Time 2: χ^2 [23] = 28.32, p = .20) (Little, 1988). Full information maximum likelihood (FIML) was used to deal with the missing data (Enders & Bandalos, 2001). A Monte Carlo simulation study suggested that a sample size of more than 250 could achieve a power greater than .80 for a 4-class model (Dziak et al., 2014). Similarly, for a well-defined model with uneven transition probabilities and uneven class sizes, $N \geq 250$ could achieve a power greater than .80 with minimal transition probabilities > .08 (Baldwin, 2015). All models were estimated by Mplus (Muthén & Muthén, 2017) through the R package *MplusAutomation* (Hallquist & Wiley, 2018), which integrates into the R statistical environment .

First, LCA was computed at two time points. Smaller values of Consistent Akaike Information Criterion (CAIC), Bayesian Information Criterion (BIC), Sample-size adjusted Bayesian Information Criterion (SABIC) and Approximate Weight of Evidence Criterion (AWE) indicate a better fit. A significant p value of Bootstrapped likelihood ratio test (BLRT) suggests that the k-class model is more suitable than (k-1) class model. An Entropy value closer to 1 indicates better. The value of Bayes Factor (*BF*) less than 3 is considered weak evidence for k-class over (k+1) class, and $BF > 10$ is strong evidence for k-class. Finally, correct model probability (*cmP*) provides an estimate of each model being "correct" out of all models considered, and the model with the largest value should be selected (Nylund-Gibson & Choi, 2018). Meanwhile, parsimony, interpretability and clinical meaningfulness were also considered in selecting the optimal model. As previous studies suggested (Boelen et al., 2019;

Maccallum & Bryant, 2019), values of conditional probabilities greater than .60 are considered as a high probability that the symptom or growth was present in the class, values between .15 and .59 as a moderate probability, and values below .15 as a low probability.

Then ML three-step approach were conducted to examine the relationships between social demographic information and class membership (Nylund-Gibson et al., 2019).

Before computing LTA, the chi-square difference test was used to examine whether the meaning of the latent classes remains constant over time. By comparing the full invariant model (same item-response probabilities across two-time points) with the baseline model (all parameters were freely estimated), no statistically significant difference provides support for measurement invariance across time, a pre-requisite for LTA (Sorgente et al., 2019). Then based on the optimal model identified by LCA, LTA with a three-step approach was used to examine the transitions of PGD symptoms-PTG classes over time (Nylund-Gibson et al., 2014).

Results

Cross-sectional LCA measurement models

The fit indices for the one- to five-class solutions are presented in Supplemental Table 2.

At both times, all Entropy values were greater than .80 and BLRt *p* values were significant. The 4-class solution had the lowest BIC, CAIC values, and the largest *cmP* values. The values of *BF* (3-class model: 0; 4-class model: > 100) also supported the 4-class model. Therefore, the 4-class solution was selected as the optimal model for two time points based on a combination of statistical and theoretical considerations.

According to the probabilities of members in each class endorsing grief and PTG indicators (Figure 1), the four subgroups were named: ‘Growth’ class (Time 1: 17.8%; Time 2:

23.3%), ‘Combined Grief and Growth’ class (Time 1: 24.8%; Time 2: 17.6%), ‘Low Grief’ class (Time 1: 33.9%; Time 2: 37.8%) and ‘High Grief’ class (Time 1: 23.5%; Time 2: 21.3%). The growth class was characterized by high probabilities of PTG and low probabilities of all but one PGD symptom (i.e. Longing or yearning for the child = .17 at Time 1 and .21 at Time 2). Contrarily, the high grief class exhibited high probabilities of PGD symptoms and low probabilities of most PTG items. Shidu parents in combined grief and growth class reported prominent PGD symptoms, such as yearning, emotional pain, sense of meaninglessness and loneliness. Meanwhile, they also experienced significant positive changes in some aspects (e.g., more proactive in making positive changes, more compassion and self-reliance). Members in the low grief class exhibited low probabilities of most PGD symptoms, similar to those in growth class. However, by comparison they reported much more moderate/low probabilities of growth than the growth class and combined grief and growth class.

The exact values of probabilities of the four-class model of PGD symptoms and PTG are presented in Table 3 in Supplementary materials.

Associations of class membership with demographic and loss-related variables

Detailed socio-demographic and loss-related information of participants across latent classes are shown in Table 4 in Supplementary materials. Results of the multinomial logistic regression analyses with the low grief class as a reference are presented in Supplemental Table 5. Females were more likely to belong to the high grief class (Time 1) and the combined grief-growth class (Time 1 and Time 2), rather than the low grief class. Additionally, shidu parents without a partner were also more likely to belong to the high grief class (Time 2). Compared with individuals in the low grief class, members of the growth class (Time 1) or combined grief

and growth class (Time 2) were more likely to have received a high school education or higher. Time since loss could significantly predict class membership at Time 1, but not Time 2. The longer the length of bereavement, the more likely shidu parents were to belong to the low grief class rather than the high grief class. Having a grandchild significantly influenced the bereavement adjustment (Time 2), with those having a grandchild more likely to be classified in the growth class.

Transitions in patterns of PGD symptoms and PTG over time

Results of the chi-square difference test indicated that the 4-class model demonstrated measurement invariance across the two-time points (difference test value = 94.81, *df* = 76, *p* = .31). Please refer to Supplementary Table 6 for detailed results information.

The transition probabilities are reported in Table 1. From Time 1 to Time 2, shidu parents in the growth class or combined class had about a 36% probability of moving into the low grief class. More than half of individuals in combined grief-growth class experienced a decrease in grief levels, moving into either the growth class (19.3%) or the low grief class (36.9%), while the probability of the same decrease in grief was shown in 23.0% (8.5% and 14.5%, respectively) of the high grief class. Compared with individuals in the high grief class (8.5%), members in the low grief class (20.4%) had a higher probability of moving to the growth class. Unexpectedly, members of the low grief class had a similar probability of transitioning to the high grief class as members of the combined class (11.4% VS 11.3%.). There were 8.1% of shidu parents staying in the combined class (24.8%*32.5%) and 2.8% moving from combined class to high grief class (24.8%*11.3%). Additionally, 12.7% of shidu parents remained in the high grief class (23.5%*54.1%) and 5.4% transitioned from high grief class to combined class

(23.5%*22.9%). That is to say, a total of 29.0 % of the shidu parents sampled suffered from persistent high levels of grief. Notably, individuals classified in the growth class in the current sample were highly unlikely to move into the High grief class over time.

Discussion

This study extended existing literature on grief and PTG in bereavement by applying LCA and LTA in a unique sample of bereaved parents who lost their only child. Four meaningful classes that changed over time were identified: Growth class, Combined Grief and Growth class, Low Grief class, and High Grief class. From Time 1 to Time 2, overall, the proportion of the growth class and the low grief class increased. However, 29% of shidu parents suffered from persistent severe grief.

The extraction of four classes in our study aligns with a previous trajectory study in a general population following bereavement (Smith & Ehlers, 2020), but differs from others that identified three classes (Kokou-Kpolou et al., 2022; Zhou et al., 2018). Specifically, our pattern of responding mirrors Bonanno's 2008 findings of chronic, delayed, recovery, and resilience classes. The 4-class model is theoretically consistent with the Resilience and Thriving Model, which suggests four potential responses to trauma: succumbing, survival with impairment, resilience, and thriving (O'Leary & Ickovics, 1995). The most common response to loss, as supported by literature, is natural adaption (Simon et al., 2020; Smith & Ehlers, 2020). Our results reflected this, showing that the low grief class was the largest among shidu parents at both time points. For about one-fifth of shidu parents (growth class), successful coping with the loss not only resulted in less grief but also enhanced their capability to handle difficulties, fostering a new understanding of life and relationships. The combined grief and growth class

observed in our study is consistent with a previous LCA study on other bereaved populations (Zhou et al., 2018). These findings support the view that PTG and grief are not simply opposite ends of a continuum but can coexist. (Hamby et al., 2022). Additionally, the Resilience and Thriving Model suggests that one possible response to trauma is a compounding and continuation of detrimental effects, which may ultimately lead the individual to succumb to chronic grief and impairment (O'Leary & Ickovics, 1995). In line with this, more than one-fifth of shidu parents were classified as belonging to the high grief class at both time points, experiencing chronic grief. However, the results also suggest that presence of PTG cannot entirely alleviate psychological pain. The combined grief and growth class demonstrated at least one moderately strong symptom of grief. Similarly, low levels of PTG did not necessarily indicate poor adaptation to child loss (e.g., low grief class) (Tedeschi et al., 2018). These findings underscore the complexity of grief responses and the necessity for nuanced support strategies for bereaved parents.

Shidu mother and individuals without a partner were more likely to belong to the high grief class. The results are consistent with the findings of a recent meta-analysis of risk factors for PGD (Buur et al., 2023). Besides, higher educational attainment may be associated with a greater likelihood of experiencing personal growth following a loss, either alone (growth class) or in conjunction with grief (combined grief and growth class). The finding that time since loss significantly predicted class membership only at Time 1 may be because bereaved parents may need some time to make sense of death, accept the reality and gain actual positive changes (Helgeson et al., 2006; Waugh et al., 2018). However, as time goes by, the influence of time since loss on adjustment may diminish. In addition, having a grandchild, rather than the cause

of death, was a significant factor in predicting class membership. This result may be because traditional Chinese culture emphasizes the importance and necessity of having descendants.

The transitional analyses findings highlight that for a portion of the shidu parents, PTG is unstable. The Janus-face model of PTG (Zoellner & Maercker, 2006) posits that PTG encompasses both constructive growth (representing genuine positive changes such as personal strength and improved relationships) and illusory growth (such as maladaptive coping mechanisms that help individuals feel better in the short term but not the long term) (Boals, 2023). Just over a third of individuals in the growth and combined grief and growth classes transitioned to the low grief class – a class with comparatively less growth - while more than half of individuals in these classes remained consistent in their growth profile. This pattern of results might point to those whose optimistic outlook and self-efficacy at the start of the study acted as a form of cognitive avoidance (Zoellner & Maercker, 2006), or it could reflect an influx of temporary social support in the aftermath of a traumatic loss which bolstered PTG (Waugh et al., 2018). However, these results also highlight that while PTG may facilitate reductions in PGD, or conversely the absence of it maintains PGD as in the high grief class, its stability across time is not necessarily predictive of grief adaptation.

Individuals in the combined grief-growth class had a probability of over one-third of transitioning to the low grief class, and about one-fifth of transitioning to the growth class. According to the Grief to Personal Growth Model (Hogan & Schmidt, 2002), some bereaved people may cope with the grief and intrusion by avoidance, which can temporarily keep them away from emotional pain. With adequate social support, they may gradually come to terms with their loss, reduce the severity of the grief, and have potential to make the transition toward

PTG. While for shidu parents who lacked social support and could only rely on avoidance strategies to relieve their current grief, long-term excessive avoidance can interfere with adapting the loss and lead to prolonged grief (Iglewicz et al., 2020). So shidu parents in the low grief class may have reduced their grief severity because they have adapted to the new life with the support of others. It was also possible that avoidance resulted in a temporary absence of obvious grief symptoms, rather than successful adaptation. This may be one of the reasons why shidu parents in the low class had a 23.4% probability of reporting severe grief at Time 2 (transitioning into the combined class or high grief class). Another reason may be that special times (e.g., the birthday or death date of the deceased, anniversary) often associated with resurgences with grief fell within our data collection (Xu et al., 2024). Perhaps explaining why 9% of shidu parents in the growth class moved to Combined grief and growth class.

Despite the lack of apparent initial PTG, over 30% of the high grief class demonstrated delayed growth transitioning to either the combined grief-growth class or the growth class. One possible explanation for this can be found in the Growth in Grief model which emphasizes the important role of deliberate rumination in meaning making and reconstructing a positive world-view (Calhoun et al., 2010). Although intrusive thoughts predominate immediately after bereavement, it is more likely that intrusive and deliberate thoughts coexist or oscillate over time (Stroebe & Schut, 1999). Gradually, as emotional pain is managed, it may be more possible for the bereaved to engage in more reflective thinking creating meaning in their loss and reconstructing a new worldview.

However, approximately one third of shidu parents reported severe and enduring grief across the study (staying in or moving between combined class and high grief class). This is

consistent with previous studies in this sample, which reported rates ranging from 22.2% to 35.5% (Xu et al., 2022; Zhang et al., 2020; Zhou et al., 2020). In a society that places great value on children, child death represents one of the most painful experiences. For some shidu parents, this loss means unfulfilled responsibilities to continue the family bloodline and the loss of crucial emotional support and life goals. The death of a child also violates the expectation that children should outlive their parents. Despite their efforts to reconstruct positive assumptive world beliefs and achieve positive changes, these parents continued to experience intense longing for their child, emotional pain, and feelings of meaninglessness and loneliness. Compared to a prevalence of 3-14% in the general population (Lundorff et al., 2017; Pociunaite et al., 2023), our results confirm shidu parents are at particular risk of PGD.

Clinical implications

The results of this study add to existing research showing that the bereavement outcomes of losing the only child are heterogeneous. ~~Regularly screening and identifying subgroups at high risk for psychopathology may help guide with whom and when to intervene~~. A tiered-care approach is often recommended after bereavement, as it allows for more targeted and effective support based on individual needs (Killikelly et al., 2021). This approach may be particularly effective for shidu parents, given that grief counseling services in China are still in their early stages of development (Yuan et al., 2022). It is recommended that bereavement charities and trained volunteers conduct regular screenings to identify shidu parents at high risk. Those at low risk of difficulties could benefit from support and compassion provided by their informal networks, while those whose grief remains severe and enduring would require specialist interventions. Considering that the persistent high levels of grief were observed in 29.0% of

shidu parents, grief-focused treatments may be needed for members in high class. Additionally, the existence of growth class supports that PTG is worthwhile to be considered in clinical practice. It may be beneficial for social workers and clinicians to encourage reflection in line with a growth model with shidu parents, which may help them find meaning in death (Tedeschi et al., 2018). However, it is important to note that therapists should not necessarily expect their clients demonstrate significant growth as their PGD symptoms decrease.

Limitation

First, this was an exploratory study. The number and characteristics of the subgroups of shidu parents must be interpreted with caution. The convenience sampling method we used selected participants that were easily accessible rather than a random sample. This may limit the generalizability of the conclusions. Moreover, the transition probability from the Growth class to the High grief class was zero, which may result in potentially insufficient statistical power with the current sample size. Another limitation may be related to the measure of PTGI. Although the PTGI is the most commonly used tool to assess PTG (Infurna & Jayawickreme, 2019), the perceived growth assessed by PTGI may not reflect genuine positive changes (Gangel et al., 2023). Future studies with greater methodological precision, such as a qualitative approach using a semi-structured interview, are encouraged to gain more information on potential positive outcomes after bereavement. Finally, due to the increasingly strict COVID-19 pandemic prevention policies at that time, this study only collected data on two occasions with an interval of five months. Future studies with long-term, multiple assessments of grief and PTG could be conducted to extend the results of this study.

Conclusion

The current study provided evidence for the heterogeneity of bereavement outcomes in Chinese shidu parents. Nearly thirty percent of shidu parents may experience chronic and disabling grief. Genuine PTG might play a role in promoting a reduction in PGD and could be considered when designing targeted interventions for this particularly at-risk group.

Data availability statement

The current data are available from the corresponding author upon reasonable request. The data are not publicly available due to protection of personal information.

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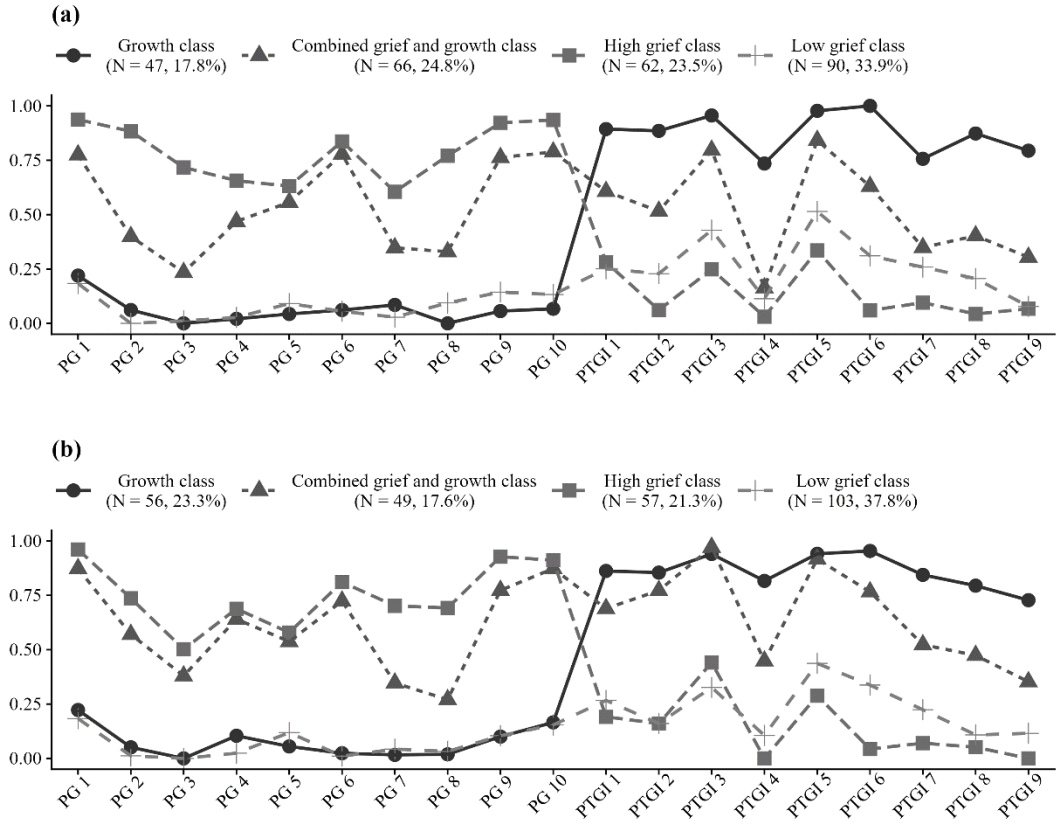

Figure 1 Response probabilities for the 4-class model at Time 1 (a) and Time 2 (b)

Table 1 Transition probabilities between latent classes from Time 1 to Time 2

Time 1 \ Time2	Growth class (n = 23.3%)	Combined grief and growth class (n = 17.6%)	Low grief class (n = 37.8%)	High grief class (n = 21.3%)
Growth class (n = 17.8%)	54.8%	9.0%	36.2%	0
Combined grief and growth class (n= 24.8%)	19.3%	32.5%	36.9%	11.3%
Low grief class (n= 33.9%)	20.4%	12.0%	56.2%	11.4%
High grief class (n =23.5%)	8.5%	22.9%	14.5%	54.1%