

Strategic family resilience: health declines and intergenerational relationships in multi-child Chinese families

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As population aging emerges as a global concern, health declines among older parents have become prevalent. However, we know little about how intergenerational relationships adapt to declines in older parents' physical, mental, and cognitive health, considering their multi-dimensional and ambivalent natures and the multi-child family context. Drawing on four waves (2014, 2016, 2018, and 2020) of data from a nationally representative survey, the China Longitudinal Aging Social Survey, we found that parent-child relationships became closer after declines in older parents' physical and cognitive health, while the variation in parent-child relationships across children increased. The greater intimacy was driven by increased functional exchanges and associational connections rather than improved emotional affinity. Compared to families without daughters, the pattern was more pronounced in families with daughters. Moreover, intergenerational relationships were unresponsive to declines in mental health. These findings suggest that Chinese families employ strategic family resilience in response to changing family demands.

Key words: health decline; family resilience; intergenerational relationship.

Introduction

As population aging becomes a global challenge, health declines among older adults have become increasingly common within families (GBD 2019 Ageing Collaborators 2022). This global trend underscores the necessity to investigate how families adapt to the changing demands and responsibilities following older parents' health declines. Intergenerational relationships constitute a central social relationship and critical resources for older parents, exerting a profound influence on their well-being (Thomas and Umberson 2018; Chen and Zhou 2021).

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Scholars have delved deeper into understanding these relationships, revealing their multi-dimensional (e.g., contact, affinity, consensus, function, norms, and structure aspects) and ambivalent natures (Bengtson and Roberts 1991; Lüscher and Pillemer 1998). Given the inherent complexity of intergenerational relationships, it is essential to prospectively examine how these ties adapt in response to the health declines of older parents, as this can deepen our understanding of family dynamics and yield policy insights to improve the quality of care for older populations.

The health declines of older adults can substantially impact not only their own lives but also the functional exchanges, emotional affinity, and contact frequency between parents and children, consequently reshaping their intergenerational relationships (Kaufman and Uhlenberg 1998; Choi et al. 2015; Reyes and Shang 2024). For instance, parents' health declines can lead to increased financial, caregiving, and emotional demands and responsibilities, thereby altering the dynamics between parents and children. However, there is limited understanding of how various dimensions of intergenerational relationships change concurrently in response to older parents' health declines—a process that may fundamentally redefine intergenerational relationships. Moreover, as significant life events, older parents' health declines may disrupt family equilibrium, generating tension as members strive to establish a new balance (Bowen 1975; Bavelas and Segal 1982). In a multi-child family, each parent-child dyad may respond differently to a parent's health decline, and children may renegotiate their roles and responsibilities to restore family balance, reflecting the resilience of intergenerational relationships. Given the potentially varying response of each parent-child relationship, it remains unclear whether intergenerational relationships will collectively become closer or more alienated following a parent's health decline, and whether the diversity of intergenerational relationships across multiple children will increase or decrease. Addressing these questions is essential to unraveling the complexities of intergenerational relationships and their resilience to critical life events within multi-child families.

China provides an important social context for investigating our research questions. Due to the enduring influences of Confucian culture and the absence of effective social security systems, older parents heavily depend on their adult children for care and support (Hsu 1985). In this sense, functional exchanges have dominated the maintenance of intergenerational relationships (Xie and Zhu 2009), even though relationship harmony across all aspects is considered important. Moreover, showing favoritism toward specific children, particularly the eldest son, has been deemed acceptable and normative (Cong and Silverstein 2012). Adult children, particularly sons, often adopt a collaborative approach to caring for their older parents, such as sharing responsibilities or designating one male sibling as the primary caregiver (Fei 1983). However, fundamental social transformations in recent decades have altered Chinese perceptions of intergenerational relationships. Specifically, emotional closeness has gained importance comparable to functional support; moreover, fostering comprehensive and harmonious relationships with all children has been prioritized over the purely functional aspect of single parent-child relationships (Li and Zhang 2023). Furthermore, daughters have assumed a more significant role in providing care and support for older parents (Lei 2013; Hu 2017). The changing importance of daughters and sons in old-age care makes it unclear whether changes in intergenerational relationships following parents' health declines vary by children's gender.

Using four waves of data (2014, 2016, 2018, and 2020) from a nationally representative survey—the China Longitudinal Aging Social Survey (CLASS)—we employed k-means clustering, multinomial logistic regression, and difference model to address the following specific research questions: Do the types of intergenerational relationships collectively become closer or more alienated following a decline in an older parent's health within multi-child families? Do the types of intergenerational relationships across multiple adult children become more homogeneous or heterogeneous after a decline in an older parent's health? Do these two associations vary by children's gender?

Theoretical framework

In this section, we begin by introducing the theories and measurements that help us understand and evaluate the complexities of intergenerational relationships. We then employ the life course perspective and family systems theory to illustrate the associations between older parents' health declines and intergenerational relationships. Finally, we delve into the Chinese context by emphasizing the increasing significance of emotional affinity in intergenerational relationships and the expanding responsibilities of daughters in providing care for older parents (Xie and Zhu 2009; Li and Zhang 2023).

Theorizing and measuring intergenerational relationships

Intergenerational relationships exhibit inherent complexity, characterized by multi-dimensionality and ambivalence. The evaluation of a parent-child relationship typically encompasses six key dimensions: associational, affectual, consensual, functional, normative, and structural aspects (Bengtson and Roberts 1991). However, these dimensions do not always change in the same direction with one another. For instance, frequent functional exchanges do not necessarily reflect a closer emotional bond, and substantial functional support may lead to tensions within the relationship. Scholars have acknowledged that the conflicts and potential negative effects may arise from excessive solidarity in intergenerational relationships (Silverstein, Chen, and Heller 1996). The notion of intergenerational ambivalence has been proposed (Lüscher and Pillemer 1998; Connidis and McMullin 2002) to conceptualize the contradictions and ambiguities inherent within relationships. To measure intergenerational ambivalence, direct and indirect measures, capturing coexisting contradictory emotions and behaviors, are often evaluated (Connidis 2015).

Typological methods (e.g., latent class analysis and clustering analysis) discerning major types of parent-child relationships are among the widely adopted strategies to capture the multi-dimensional and ambivalent natures of parent-child relationships (Connidis 2015). This is because these methods could efficiently capture the major patterns of complicated parent-child interactions, while maintaining intrinsic connectedness among different dimensions. Different combinations of these dimensions can represent various types of intergenerational relationships. For instance, some parent-child relationships may develop into a tight-knit type, exhibiting high levels in all dimensions; some might become more estranged, showing low levels in all dimensions; and yet others may develop into an ambivalent type, characterized by high levels of instrumental exchanges but low levels of emotional affinity (van Gaalen and Dykstra 2006; Guo, Chi, and Silverstein 2012).

Moving beyond a single parent-child situation, intergenerational relationships in a multi-child context can be more complex. The concept of "collective ambivalence" has been proposed to capture the mixed feelings of a parent toward multiple children within a family (Ward, Spitze, and Deane 2009). Prior studies have provided some guidance in evaluating collective ambivalence, known as "within-family differences" approaches (Suitor et al. 2008, 2017). For instance, the closest or the most distant parent-child relationship, and the variations of multiple parent-child relationships have often been utilized to capture collective ambivalence within a family (Ward 2008; Chen and Zhou 2021). In the current study, by comparing the changes in the closest, the most distant, and the variations of intergenerational relationships among multiple children, derived from parent-child relationship typologies, between families with or without health declines of older parents, we attempt to explore the changes in "within-family differences" across families in response to parents' health declines.

Health and intergenerational relationships

The life course perspective and family systems theory offer theoretical explanations for the associations between older parents' health declines and intergenerational relationships, as well as for the underlying family resilience in response to significant life changes.

The life course perspective views intergenerational relationships as dynamic trajectories that are time-varying, influenced by life events, interconnected in social networks, and embedded in social contexts (Elder 1994; Elder, Johnson, and Crosnoe 2003). Health declines, as significant life events, can profoundly impact the life experiences of older parents, change the arrangements of their children's lives, and consequently affect their intergenerational relationships. Specifically, health deteriorations may lead to increased financial, caregiving, and emotional needs (e.g., Zarit and Eggebeen 2005). Previous studies based on a general evaluation of relationship quality or one aspect of intergenerational relationships have revealed that declines in parents' health are linked to decreased quality of intergenerational relationships (Kaufman and Uhlenberg 1998), and geographical relocations that keep parents and children closer physically (Choi et al. 2015; Reyes and Shang 2024; Jessee, Bordone, and Hank 2025). However, given that intergenerational relationships are often perceived to encompass various dimensions such as contact, affinity, consensus, function, norms, and structure (Bengtson and Roberts 1991), it is insufficient to only examine the changes in one aspect of intergenerational relationships following a parent's health decline. It is thus necessary to investigate how the combinations of these various dimensions (i.e., types of parent-child relationships) change following older parents' health declines.

The life course perspective (Elder, Johnson, and Crosnoe 2003) and family systems theory (Bowen 1975) understand intergenerational relationships as interdependent and interactive within families. The principle of "linked lives" in the life course perspective (Elder, Johnson, and Crosnoe 2003) recognizes that relationships between parents and their children can impact each other due to their interconnectedness within shared family networks. Family systems theory also emphasizes the interdependence and interaction among family members, interpreting the family as a complex system with deeply interconnected members (Bowen 1975). In a multi-child context, older parents' health declines affect not only each individual parent-child relationship but also the dynamics of multiple parent-child relationships. A decline in a parent's health has the potential to disrupt the balance of the family system, alter the lives of both parents and children, and change the dynamics of existing multiple parent-child relationships (e.g., Wen and Huang 2024). However, families tend to resist change and strive to maintain balance (Bowen 1975; Bavelas and Segal 1982). The abilities of families to navigate through significant family changes can be understood as a form of resilience. This resilience operates subtly in everyday life but plays a crucial role in buffering against both daily challenges and crucial family transitions. It involves adaptations in family structure (e.g., living arrangements), adjustments in function (e.g., allocations of resources), and changes in emotional affinity. Following an older parent's health decline, children may renegotiate their roles and boundaries, redistribute resources, and even accommodate living arrangements—establishing a collaborative or compromised approach to achieve a new balance that ultimately reshapes the dynamics of intergenerational relationships. For instance, some children may take on more financial or caregiving responsibilities, some may provide more emotional support, and others may contribute in different ways or not at all. These diverse responses across multiple children may collectively change the dynamics of intergenerational relationships, raising a natural question of whether they will become more homogeneous or more heterogeneous.

To sum up, motivated by the life course perspective and family systems theory, this study seeks to address gaps in the existing literature by examining, in the context of multiple children, following an older parent's health decline, (1) *whether the types of intergenerational relationships will become closer or more alienated*, and (2) *whether the pattern of intergenerational relationships across multiple children transitions toward either more homogeneous or more heterogeneous*.

The Chinese context and gendered strategic family resilience

China provides an important social context for addressing our research questions, attributed to the growing emphasis on emotional affinity in intergenerational relationships and the increasing

involvement of daughters in old-age support (Xie and Zhu 2009; Li and Zhang 2023). Before delving into these unique features, we will first present the unique cultural background.

Due to the enduring and significant impact of Confucian culture, the Chinese have consistently placed a high value on harmonious relationships between generations. As a core value in Confucian culture, filial piety explicitly defines parents' and children's obligations and responsibilities (Hsu 1985). Fei (1983) proposed a "feeding model," suggesting that parents are obligated to raise their younger children, while adult children, especially the eldest son, are responsible for caring for their older parents. This model became institutionalized in China's historical self-subsistence agricultural economy and was operated in the absence of a functional social security system. Thus, even though Chinese collectivist family norms emphasize collective emotional cohesion among family members, parent-child relationships are fundamentally sustained by practical functional exchanges (Xie and Zhu 2009). This heavy reliance on functional support from adult children, combined with patriarchal tradition, results in unequal investments among children and favoritism toward (the eldest) sons over daughters (Cong and Silverstein 2012).

Over the past several decades, sweeping social transformations and modernization have drastically altered the nature of intergenerational relationships and their underlying values in China. Advances in social security and the availability of services for older adults have reduced their dependence on their children for assistance and care (Zhu and Walker 2018). There has been an increasing focus on emotional affinity between parents and their children. Recent studies suggest that older parents seek a close emotional bond with all their children to fulfill their psychological needs (Li and Zhang 2023). Furthermore, the role of functional exchanges has expanded beyond their practical and tangible benefits to symbolize emotional closeness (Xie and Zhu 2009). This shift toward valuing emotional affinity as important as (if not more than) functional exchanges in intergenerational relationships has been termed as an "emotional turn" by scholars (Li and Zhang 2023). This transformation, coupled with the tradition of filial piety, has raised questions about the changes in the combinations of different aspects of intergenerational relationships following a decline in an older parent's health.

Along with the "emotional turn," daughters have taken on increasingly significant roles in providing old-age support. Prior studies have long emphasized that the gender of adult children is a critical factor influencing intergenerational relationships (Horowitz 1985). In contemporary China, compared to sons, daughters offer more instrumental support, such as caregiving and housework, and have a closer emotional bond with their parents (Lee, Parish, and Willis 1994; Lei 2013). Recent studies have revealed that, in rural China, children negotiate a collaborative approach to supporting their parents, with daughters taking on instrumental support and sons handling financial support (Lei 2013); however, in urban China, daughters contribute equally (if not more) to the financial support of their parents as compared to sons (Xie and Zhu 2009; Hu 2017). Significant social changes can explain the growing roles of daughters in old-age support. First, massive population mobility has altered patrilocal living arrangements, rendering sons no longer reliable supporters. Second, long-standing family planning policies and demographic transitions have altered the gender composition of children within families (Lei 2013), diminishing parents' favoritism toward sons over daughters. More importantly, the improvements in women's educational attainment and economic status have empowered them with the capability and autonomy to support their parents (Xie and Zhu 2009). Furthermore, the modernization process has a dual influence: it weakens the traditional caregiving roles of sons and daughters while reinforcing women's roles as primary caregivers and kin-keepers (Hu 2017). This dual influence may promote not only daughters' comprehensive participation in intergenerational support for older parents as a provider but also their responsibilities of maintaining family ties and resolving family conflicts as a mediator (Cong and Silverstein 2012).¹ In light of this scenario, it is plausible to anticipate that intergenerational relationships may become closer and more homogeneous following older parents' health declines in families with daughters, as compared to families without daughters.

Methodology

Data

We used four waves (2014, 2016, 2018, and 2020) of data from the CLASS. The CLASS is a large-scale, nearly nationally representative, and longitudinal study that provides comprehensive information on Chinese older adults, including physical, mental, and cognitive health, as well as intergenerational relationships with multiple children. The survey covers twenty-eight provinces or autonomous regions and implements a multi-stage stratified random sampling procedure, where counties serve as the primary sampling units and urban communities or rural villages serve as the secondary sampling units.

The CLASS surveyed 11,511, 11,471, 11,418, and 11,398 respondents (aged fifty and above) in the waves of 2014, 2016, 2018, and 2020, respectively. To construct our analytical samples, we first conducted a typological analysis on the four-wave observations of each parent-child (aged eighteen and above) relationship of older parents (109,440 cases in total, referred to as the *parent-child sample*). Next, to track changes in intergenerational relationships, we identified older parents who responded in consecutive follow-up waves (i.e., 2014–2016 [4,553 observations], 2016–2018 [9,642 observations], and 2018–2020 [9,164 observations]) and kept those in multi-child families² (i.e., 2014–2016 [2,694 observations], 2016–2018 [6,346 observations], and 2018–2020 [6,285 observations]).³ We combined these three sets of follow-up data and obtained a mixed sample of 8,310 older parents with 15,325 person-period observations (referred to as the *parent-period sample*) with indicators identifying both initial and ending years of waves. We then merged the *parent-period sample* with the initial and ending years of parent-child relationship types derived from the *parent-child sample*. Finally, we excluded respondents with missing values in indicators of interest (3,029 older parents [person-period = 7,397] dropped).⁴ Our final sample (referred to as the *parent sample*) comprised 5,281 older parents with 7,928 person-period observations.

Measures

Health decline

We measured older parents' health declines regarding three types of health statuses: physical, mental, and cognitive health. Physical health was captured by the self-rated health, measured with a five-point Likert scale (1 = very poor to 5 = very good). Mental health was assessed using the nine-item Center for Epidemiological Studies Depression Scale (CES-D), including positive and negative emotions, somatic symptoms, and feelings of worthlessness and idleness. Each item was scored 0 (rarely or none of the time), 1 (some of the time), or 2 (most or all of the time), resulting in a total score ranging from 0 to 18. Higher scores indicated a higher level of depressive symptoms with positive emotion items reverse-coded. The Cronbach's alpha, capturing internal consistency, for the nine items was 0.75. Cognitive health was assessed using a modified short version of the Mini-Mental State Examination (MMSE) instrument (Folstein, Folstein, and McHugh 1975). The instrument evaluates orientation to time and place (e.g., survey date, neighborhood/village name, National Day date, President's name, and Chinese Zodiac sign), attention and calculation skills (via the Serial Sevens test), and registration and recall abilities (through immediate and delayed recall of three Chinese nouns). A composite score was derived from sixteen dichotomous items (true/false), ranging from 0 to 16, with higher scores indicating better cognitive performance.

We prospectively defined three types of health declines—physical (self-rated health), mental (depressive symptoms), and cognitive (cognitive functioning), based on significant changes of health status between the initial and ending years. Physical health decline was determined as a lower self-rated health score in the ending year compared to the initial year (1 = Yes, 0 = No); mental health decline was identified by at least a change in CES-D score from a lower to a higher quartile over the two-year period (1 = Yes, 0 = No); cognitive health decline was captured by at least a change in MMSE score from a higher to a lower quartile over the two-year period (1 = Yes, 0 = No). These relative measures have advantages in accounting for systematic shocks (e.g., the global outbreak of Coronavirus Disease 2019) that affect the overall distribution of

mental or cognitive health in the population, and in adjusting for secular trends, cohort effects, and potential differences in scale or response styles across waves, allowing for consistent comparisons over time and across individuals. However, relative measures may have disadvantages in classifying individuals as experienced health declines even with small changes that cross a quartile threshold, while overlooking larger changes that do not. For robustness, we also re-examined the results based on two alternate measures capturing absolute changes.⁵ Moreover, we reconstructed these relative measures using varying percentiles to examine the elasticity of health declines on intergenerational relationship transitions.⁶

Intergenerational relationship in a multi-child family

We assessed intergenerational relationships in three dimensions, comprising a total of nine indicators—emotional affinity (three indicators), functional exchange (four indicators), and associational connection (two indicators), to capture the multi-dimensional and ambivalent natures of intergenerational relationships. Table 1 provides details on the measurement of these indicators. Specifically, the indicators of emotional affinity included self-rated closeness with each child (rated on a scale of 1–3), self-rated emotional indifference from each child (rated on a scale of 1–4), and self-rated excessive help required by each child (rated on a scale of 1–4). The last two indicators reflect the conflicting emotional aspects of parent–child relationships. We recoded the scores of the last two indicators so that a higher score indicates greater emotional affinity. The indicators of functional exchange comprised the frequency of economic support (money, food, and gifts in Renminbi or Chinese Yuan, rated on a scale of 1–9) over the past year (from each child to the parent and vice versa), and the frequency of housework support (rated on a scale of 1–5) over the past year (from each child to the parent and vice versa). The indicators of associational connection included contact frequency through in-person meetings (rated on a scale of 1–5) or online contact frequency (rated on a scale of 1–5) over the past year.

Using the nine indicators mentioned above in our *parent–child sample*, we initially characterized the dyadic parent–child relationship for parents with each of their children. Subsequently, we standardized the nine indicators and adopted the k-means clustering method to identify each individual parent–child relationship type for parents with their multiple children (see fig. 1 for more details). The discerned five intergenerational relationship types were named *alienated*, *stressfully interacting*, *independent*, *beneficially interacting*, and *tight-knit* (labeled from 1 to 5), with higher values indicating greater solidarity of the relationship.

Based on the different parent–child relationship types identified in a multi-child family, we constructed three measures to comprehensively evaluate “within-family differences” of intergenerational relationships: the closest parent–child relationship type (the highest value), the most distant parent–child relationship type (the lowest value), and the index of qualitative variation (IQV) of various types of parent–child relationships (Ward 2008).⁷ We identified these three measures both in the initial year (as main *predictors*) and the ending year (as main *outcomes*), to track changes in intergenerational relationship types before and after older parents’ health declines in a multi-child family.

Covariates

Our analysis considered various socio-economic and demographic characteristics of older parents in the initial year, including age (in years), gender (1 = women, 0 = men), education (in years), marital status (1 = with a spouse, 0 = without a spouse), income (logarithm of annual income), residential area (1 = rural, 0 = urban), *hukou* status (1 = agricultural *hukou*, 0 = nonagricultural *hukou*), and homeownership (1 = yes, 0 = no). To account for the health status at the beginning, a parent’s physical, mental, and cognitive health in the initial year was included in the analysis of their corresponding health decline. To attenuate the interactive effects of physical, mental, and cognitive health, a parent’s CES-D score was controlled for in the analysis of physical health decline, and a parent’s instrumental activities of daily living score (range 0–16, higher scores indicating more difficulties) was controlled in the analysis of mental and cognitive health decline.

Table 1. Measurements of the three dimensions of intergenerational relationship.

Indicators	Source (from the CLASS questionnaires)	Scale
Emotional affinity		
T1. Parents' self-rated emotional closeness toward each child	T1. "Overall, do you feel close to this child emotionally?"	1 = Not close 2 = Fair 3 = Close 1 = Often 2 = Sometimes 3 = Occasionally 4 = Never
T2. Parents' self-rated emotional concern toward each child	T2. "Do you think that this child showed less care for you?"	
T3. Parents' self-rated emotional comfort toward each child	T3. "Do you think that this child requested too much help and support (money, assistance, babysitting, or housework) over the past 12 months?"	
Functional exchange		
T4. Economic support from each child to parents	T4. "Did this child send money, food or gifts to you (or your living spouse) over the past 12 months, and how much were these items worth?"	1 = 0 2 = 1–199 3 = 200–499 4 = 500–999
T5. Economic support from parents to each child	T5. "Did you (or your living spouse) send money, food or gifts to this child over the past 12 months, and how much were these items worth?"	5 = 1,000–1,999 6 = 2,000–3,999 7 = 4,000–6,999 8 = 7,000–11,999 9 = 12,000 and above
T6. Housework support from each child to parents	T6. "How often did this child help you with housework over the past 12 months?"	1 = Almost never 2 = Several times a year 3 = At least once a month 4 = At least once a week 5 = Almost every day
T7. Housework support from parents to each child	T7. "How often did you help this child with housework over the past 12 months?"	
Associational connection		
T8. Frequency of in-person meetings with each child	T8. "How often did you meet with this child over the past 12 months?"	1 = Almost never 2 = Several times a year 3 = At least once a month 4 = At least once a week 5 = Almost every day
T9. Frequency of online contact with each child	T9. "How often did you contact this child online (through phone, WeChat, and other means of telecommunication) over the past 12 months?"	

CLASS, China Longitudinal Aging Social Survey.

Our analysis also accounted for the characteristics of children because their characteristics and life-course events could concurrently impact both the health declines of older parents and their intergenerational relationships (Swartz 2009; Torres et al. 2021). We included the ages of the eldest and youngest child (in years), the highest educational attainment among the children (in years), the marital status of children (1 = at least one child in divorce or widowhood, 0 = none of the children in divorce or widowhood), and the work status of children (1 = at least one child not employed, 0 = all children employed). The latter two measures not only reflect children's socio-economic status but also capture potential negative life events such as divorce, widowhood, or unemployment. Additionally, the initial year (2014, 2016, and 2018) of each observed period was included to control for period effects. For the outcome of the IQV of parent-child relationships, we also included both the IQV and the mean of parent-child relationship types in the initial year because the changes in the IQV may be positively associated with them.

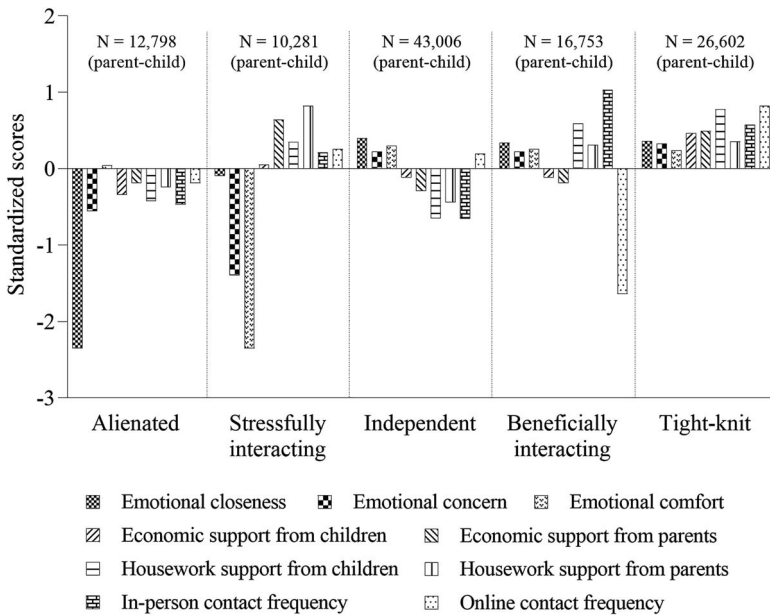


Figure 1. Types of intergenerational relationships. Notes: Our analysis was computed using the k-means clustering, including 21,072 parent samples and 109,440 parent-child samples across four waves (2014, 2016, 2018, and 2020) of the China Longitudinal Aging Social Survey (CLASS).

Analytical strategy

We examined how older parents' health declines are associated with changes in parent-child relationships in multi-child families. First, we employed the k-means clustering to identify intergenerational relationship types based on the aforementioned nine indicators (see fig. 1 and Table 1). Subsequently, we created three measures of intergenerational relationships to capture the diversity of parent-child relationships in multi-child families—the closest type, the most distant type, and the IQV of types.

Next, we employed multinomial logit models to investigate changes in the types of intergenerational relationships in multi-child families from the initial to the ending years. The multinomial logit model is suitable for analyzing nonlinear probability models with multiple categories (Breen, Karlson, and Holm 2018). These models were used to estimate the coefficients that depict the transitions of the closest and most distant types of intergenerational relationships (i.e., the two categorical outcomes) from the initial to the ending year. The multinomial logit model was specified as follows:

$$\log\left(\frac{\Pr(\text{Type}_{i,t} = j)}{\Pr(\text{Type}_{i,t} = 1)}\right) = \alpha_j + \beta_{j,1} \times \text{Type}_{i,t-1} + \sum_{k=2}^N \beta_{j,k} \times X_{i,k} \quad (1)$$

In equation (1), $\text{Type}_{i,t-1}$ refers to the closest (most distant) types of intergenerational relationships in the initial year for parent i ; $\text{Type}_{i,t}$ refers to the closest (most distant) type of intergenerational relationship in the ending year for parent i ; j denotes the status of the closest (most distant) type of intergenerational relationships, ranging from 2 to 5 (baseline status = 1); $X_{i,k}$ represents covariates and $\beta_{j,k}$ refers to their coefficients; α_j represents an intercept. The outcome in this equation is the closest (most distant) type of intergenerational relationship in the ending year, and the main predictor is the closest (most distant) type of intergenerational relationship in the initial year.

Because interpreting the coefficients of a multinomial logit model can be challenging, we converted them (i.e., log-relative-risk) to marginal effects to estimate the transition probabilities (Breen, Karlson, and Holm 2018), with all covariates controlled at their sample mean values (Zimmer et al. 1998).⁸ The equation for the marginal transition probabilities was specified as follows:

$$b_{j,(t-1) \rightarrow t}^{ME} = \hat{\Pr}(\text{Type}_t = j) \times \left[b_{j,(t-1) \rightarrow t}^{\log} - \sum_{m=1}^5 \hat{\Pr}(\text{Type}_t = m) \times b_{m,(t-1) \rightarrow t}^{\log} \right] \quad (2)$$

In equation (2), $b_{j,(t-1) \rightarrow t}^{ME}$ refers to the probability of the closest (most distant) type belonging to status j (labeled from 1 to 5) in the ending year, and it also indicates the marginal transition probability from the initial to the ending year; $b_{j,(t-1) \rightarrow t}^{\log}$ is derived from the coefficient $\beta_{j,1}$ in equation (1); $\hat{\Pr}(\text{Type}_t = j)$ and $\hat{\Pr}(\text{Type}_t = m)$ are the predicted probabilities of belonging to the status j and m in the ending year; $\sum_{m=1}^5 \hat{\Pr}(\text{Type}_t = m) \times b_{m,(t-1) \rightarrow t}^{\log}$ represents weighted average of coefficients across five categories, and $b_{m,(t-1) \rightarrow t}^{\log}$ is also derived from the coefficient in equation (1) (i.e., $\beta_{j,1}$) with status m ranging from 1 to 5.

To compare the differences in the changes of intergenerational relationship types between parents with health declines and those without such declines, we stratified our analytical samples by health decline status (yes or no), conducted multinomial logit models, separately, to estimate their coefficients (following equation 1), and then transformed the coefficients into marginal transition probabilities (following equation 2). Specifically, we estimated the probability matrices that capture the transitions of intergenerational relationship types from the initial to the ending year, influenced by three different types of health declines (physical, mental, and cognitive), respectively. By comparing the different transition probability matrices, we could investigate how health declines are associated with changes in the types of intergenerational relationships.

To examine whether the intergenerational relationships across multiple adult children become more heterogeneous or homogeneous after an older parents' health decline, we utilized a difference model to estimate the effect of a health decline on the IQV. The specification estimated by the ordinary least square approach follows:

$$\text{Difference}_{i,(t-1) \rightarrow t} = \alpha + \beta_1 \times \text{Decline}_{i,(t-1) \rightarrow t} + \sum_{k=2}^N \beta_k X_{i,t-1} + \varepsilon_{i,(t-1) \rightarrow t} \quad (3)$$

In equation (3), $\text{Difference}_{i,(t-1) \rightarrow t}$ denotes the difference in the IQV between the ending and initial year for parent i ; $\text{Decline}_{i,(t-1) \rightarrow t}$ denotes the dummy indicator of health decline from the initial to ending year for parent i ; $X_{i,t-1}$ refers to the covariates in the initial year; $\varepsilon_{i,(t-1) \rightarrow t}$ is the error term. If β_1 is positive, a decline in older parents' health is associated with an increase in the IQV.

In order to examine whether the changes in intergenerational relationships following older parents' health declines differ by family gender structure, we stratified our analytical samples into two—families with at least one daughter and families without daughters, and reran the multinomial logit models and difference models, respectively. By comparing the different transition probability matrices or changes in IQV, we could reveal whether the associations between health declines and changes in intergenerational relationships differ by family gender structure.

Results

Intergenerational relationship patterns in multi-child Chinese families

Figure 1 shows the distribution of the five types of parent-child relationships. The five types are *alienated* (11.7 percent), *stressfully interacting* (9.4 percent), *independent* (39.3 percent), *beneficially interacting* (15.3 percent), and *tight-knit* (24.3 percent). The alienated type exhibited low emotional affinity, functional exchange, and associational connections. The stressfully interacting type maintained certain associational connections but featured low emotional affinity and

imbalanced functional exchanges with high parental economic and housework support. The independent type presented high emotional affinity but low functional exchange with associational connections primarily maintained online. The beneficially interacting type exhibited high emotional affinity, low economic exchange, and high housework exchange with associational connections primarily maintained through in-person contact. The tight-knit type presented high emotional affinity, functional exchange, and associational connections.

Table 2 displays the descriptive statistics of older parents in multi-child families. The average change in the IQV was -0.014 , indicating a small decrease in variation. For the closest parent-child relationships, tight-knit types accounted for around 38.8 percent of the sample in the initial year, while the respective share increased to around 46.7 percent in the ending year. For the most distant parent-child relationships, independent types accounted for approximately 47.3 percent of the sample in the initial year, and the corresponding share decreased to nearly 42.7 percent in the ending year. In terms of health decline, 18.2 percent, 29.9 percent, and 18.5 percent of older parents exhibited a decrease in self-rated health, an increase in depressive symptoms, and a decline in cognitive functioning, respectively.

Parental health decline and changes in intergenerational relationships

Figure 2 illustrates the changes in intergenerational relationship types following older parents' health declines. Specifically, Panel A (B) shows the transition probability matrices for the closest (the most distant) intergenerational relationship. In each panel, the three columns present matrices for the types of physical, mental, and cognitive health declines, separately. The two 5×5 transition probability matrices in each column under each panel was estimated using multinomial logit models and probability transformed techniques specified in equations (1) and (2), adjusted for covariates, based on stratified samples by health decline status (yes or no). For each matrix, the vertical (horizontal) axis indicates the type of parent-child relationship in the initial (ending) year. In Panel A, the closest type became more intimate, following a decrease in self-rated health or cognitive functioning. Specifically, after a physical health decline, the alienated, stressfully interacting, independent, and beneficially interacting types had a probability of 50.1 percent, 50.5 percent, 37.3 percent, and 49.9 percent, respectively, to transit to the tight-knit type. Additionally, after a cognitive health decline, the alienated, stressfully interacting, independent, and beneficially interacting type had a probability of 50.9 percent, 55.4 percent, 42.6 percent, and 50.8 percent, respectively, to transit to the tight-knit type. However, the closest relationship type was more likely to maintain their original type (i.e., higher probabilities in the diagonal) with a mental health decline.

Panel B shows the results of the most distant relationship. Following a decline in physical or cognitive health, intergenerational relationship types demonstrate both independence (i.e., more independent) and divergence (i.e., closer or more alienated). For instance, after a physical health decline, the alienated type had the highest probability (35.7 percent) of shifting to the independent type, followed by remaining alienated (25.4 percent) or transitioning to the tight-knit type (16.0 percent). A similar pattern could be observed for the transitions of the stressfully interacting, independent, and beneficially interacting type. After a physical health decline, the tight-knit type had the highest probability (39.4 percent) of remaining tight-knit, followed by transitioning to the independent (25.6 percent) or the alienated (12.6 percent) type. However, the most distant relationship type was more likely to maintain their original type after a mental health decline.

Figure 3 depicts the estimated coefficients of three types (Panels A–C) of health decline on the changes in IQV. The coefficients were estimated using the difference model, specified in equation (3). The results show that a decline in self-rated health ($b = 0.022$, $P < .05$) or cognitive functioning ($b = 0.042$, $P < .001$) of older parents significantly increased the IQV. However, there was no significant association between the intensification of depressive symptoms in older parents and changes in the IQV ($b = -0.007$, $P > .05$).

To sum up, the closest type of parent-child relationship tends to become more intimate, while the most distant type tends to become more independent or divergent (i.e., closer or more

Table 2. Descriptive statistics of older parents aged fifty and above from 2014, 2016, 2018, and 2020 waves of the China Longitudinal Aging Social Survey (CLASS).

Measures	Definition	Mean (SD) or per cent
Intergenerational relationships		
The closest type initial (%)	The closest parent–child relationship in the initial year	
Alienated		4.490
Stressfully interacting		8.073
Independent		31.206
Beneficially interacting		17.470
Tight-knit		38.761
The closest type ending (%)	The closest parent–child relationship in the ending year	
Alienated		5.197
Stressfully interacting		7.934
Independent		28.406
Beneficially interacting		11.718
Tight-knit		46.746
The most distant type initial (%)	The most distant parent–child relationship in the initial year	
Alienated		14.051
Stressfully interacting		12.487
Independent		47.339
Beneficially interacting		8.274
Tight-knit		17.848
The most distant type ending (%)	The most distant parent–child relationship in the ending year	
Alienated		16.599
Stressfully interacting		12.071
Independent		42.684
Beneficially interacting		6.244
Tight-knit		22.402
Δ Variation	The change in the index of qualitative variation across multiple types of parent–child relationships	−0.014 (0.290)
Health declines		
Physical health decline	1 = downgrade in self-rated health (1–5 level)	0.182 (0.386)
Mental health decline	1 = increase in CES-D (0–18 score) by one quartile or above	0.299 (0.458)
Cognitive health decline	1 = decrease in MMSE (0–16 score) by one quartile or above	0.185 (0.388)
Covariates (in the initial year)		
Age	Self-reported age (in years)	69.831 (6.501)
Gender	1 = women	0.480 (0.500)
Education	Educational years	5.958 (4.077)
Marital status	1 = married	0.764 (0.425)
Individual income	Annual individual income (log)	8.549 (1.816)
Residential area	1 = rural area	0.417 (0.493)
Agricultural hukou	1 = agricultural hukou	0.524 (0.499)
Homeownership	1 = yes	0.934 (0.248)
Self-rated health	1–5 level	3.372 (0.879)
Depressive symptoms	0–18 CES-D score	7.035 (3.124)
Cognitive functioning	0–16 MMSE score	13.797 (2.677)
IADL	0–16 score	0.664 (1.763)
Child age max	Self-reported age of the eldest child	46.047 (7.527)
Child age min	Self-reported age of the youngest child	40.151 (7.093)
Child marital status	1 = at least one child divorced and widowed	0.034 (0.182)

(continued)

Table 2. Continued.

Measures	Definition	Mean (SD) or per cent
Child education max	The longest educational years of children	10.913 (3.018)
Child work status	1 = at least one child did not work	0.365 (0.481)
Year (%)	Survey year	
2014		10.608
2016		39.960
2018		49.432
Variation of relationship	The index of qualitative variation of types of parent–child relationships	0.242 (0.293)
Average type of relationship	The mean of multiple types of parent–child relationships	3.388 (1.081)
Family gender structure		
Child composition	1 = at least one daughter	0.832 (0.374)
Persons (n)		5,281
Person-years (N)		7,928

CES-D, Center for Epidemiological Studies Depression Scale; IADL, instrumental activities of daily living; MMSE, Mini-Mental State Examination.

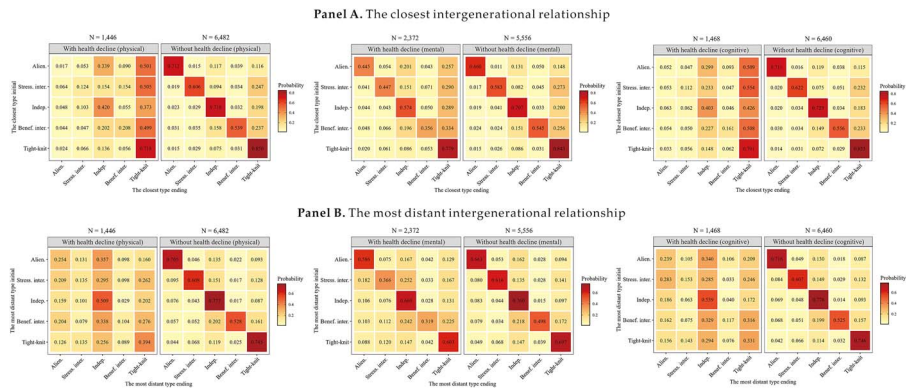


Figure 2. Transition matrices of the closest and most distant types of intergenerational relationships. Notes: Panel A (B) shows the transition probability matrices for the closest (the most distant) intergenerational relationship. The three columns present matrices for physical, mental, and cognitive health declines, respectively. The transition probability matrices in each column under each panel were estimated using multinomial logit models and probability transformed techniques, adjusted for covariates, based on stratified samples by health decline status (yes or no). For each matrix, the vertical (horizontal) axis indicates the type of parent–child relationship in the initial (ending) year.

alienated) following a decline in physical or cognitive health among older parents. Moreover, the IQV tends to increase after a physical or cognitive health decline among older parents. However, there is no clear evidence of significant changes in intergenerational relationships following a mental health decline. As a result, intergenerational relationships are more likely to be affected by physical or cognitive health declines than mental health declines.

Parental health decline and gendered family strategic responses

Figure 4 reveals gendered responses to three types (presented in columns) of older parents' health declines concerning differences in the closest (Panel A) and the most distant (Panel B) types by family gender structure. The findings show that families with at least a daughter had relatively higher transition probabilities compared to families without daughters. For instance, following

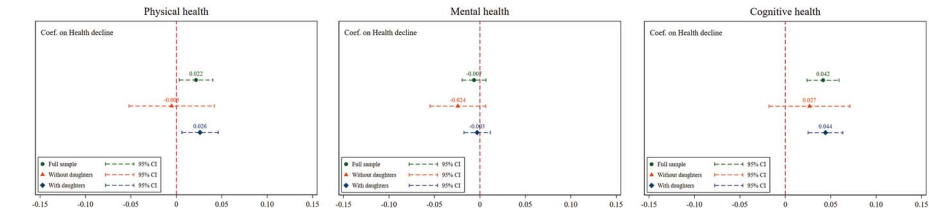


Figure 3. Effects of health declines on changes in the index of qualitative variation of multiple types of parent-child relationships. Notes: The three columns present results for physical, mental, and cognitive health declines, respectively. The coefficients were estimated using the difference model, specified in equation (3). Dotted lines represent 95 percent confidence intervals.

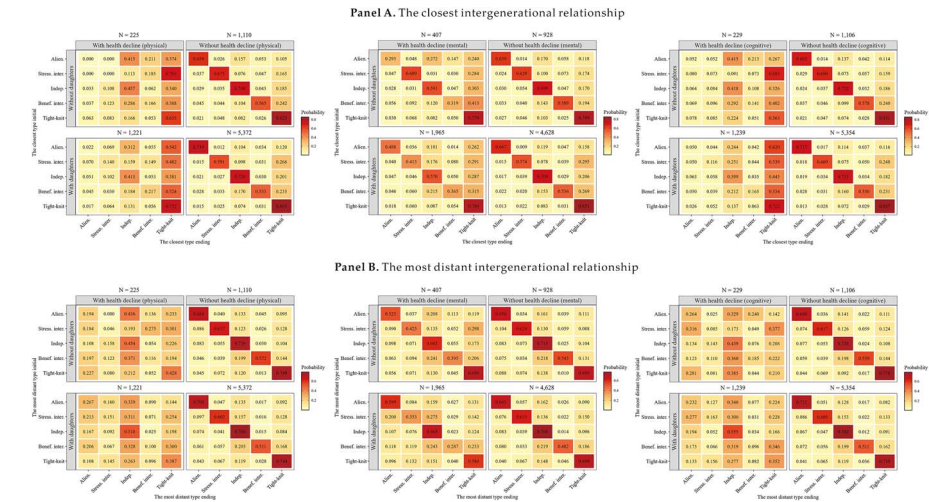


Figure 4. Transition matrices of the closest and most distant types of intergenerational relationships by family gender structure. Notes: Panel A (B) shows the transition probability matrices for the closest (the most distant) intergenerational relationship. The three columns present matrices for physical, mental, and cognitive health declines, respectively. The transition probability matrices in each column under each panel were estimated using multinomial logit models and probability transformed techniques, adjusted for covariates, based on stratified samples by both family gender structure (with daughters or without daughters) and health decline status (yes or no). For each matrix, the vertical (horizontal) axis indicates the type of parent-child relationship in the initial (ending) year.

a physical health decline, the alienated, independent, and beneficially interacting types of the closest relationships in families with a daughter had a higher probability of 54.2 percent, 38.1 percent, and 52.4 percent to transit to the tight-knit type, respectively, compared to families without daughters except for the stressfully interacting type. After a cognitive health decline, the alienated, independent, and beneficially interacting types of the closest relationships in families with a daughter had a higher probability of 62.0 percent, 44.5 percent, and 53.4 percent to transit to the tight-knit type, respectively, compared to families without daughters except for the stressfully interacting type.

Figure 3 also proves that the effects of physical and cognitive health declines on relationship variations were more pronounced in families with at least one daughter, compared to families with sons only. Specifically, in families with at least a daughter, physical and cognitive health declines in older parents increased the IQV by 0.026 ($P < .05$) and 0.044 ($P < .001$) units, respectively. These results contrast with the nonsignificant findings in families without daughters. Moreover, these results echo our previous findings indicating that significant changes in intergenerational

relationships mainly occur during physical and cognitive health declines in older parents. Additionally, the observed rise in the IQV following a physical or cognitive health decline among older parents in families with at least one daughter is likely driven by a notable improvement in the closest intergenerational relationship. Overall, these results suggest that having daughters may foster closer bonds in some intergenerational relationships in response to older parents' health declines, while also increasing the diversity of intergenerational relationships.

Supplementary analysis

To promote our understanding of why the closest and the most distant relationship types have generally become closer following physical and cognitive health declines, and why intergenerational relationships are unresponsive to mental health declines, we delved deeper into the changes in each single dimension of the closest and the most distant intergenerational relationships, when older parents face different types of health declines. Specifically, we estimated the effects of physical, mental, and cognitive health declines among older parents on changes in nine indicators (detailed in Table 1) for discerning the closest and the most distant parent-child relationship types, using equation (3). We also estimated these effects, separately, based on stratified samples by family gender structure.

Figure 5 presents the estimated coefficients of three types (shown in columns) of health declines on each dimension of the closest (Panel A) and the most distant (Panel B) parent-child types. The results indicate that an older parent's physical or cognitive health decline contributes to improvements in functional exchanges (i.e., economic support and assistance with housework from children) and associational connections (i.e., the frequency of in-person and online contacts) between older parents and their adult children, in both the closest and the most distant parent-child relationships. Additionally, mental and cognitive health declines lead to weakened emotional bonds in the closest parent-child relationships, and all three types of health declines lead to weakened emotional bonds in the most distant parent-child relationships. These findings imply that the move toward greater intimacy in the closest relationships, following a parent's physical or cognitive health decline, is probably driven by enhanced functional exchanges and associational connections, rather than an increase in emotional closeness. Conversely, the shift toward more independence or divergence in the most distant relationships, following a parent's physical or cognitive health decline, results from a complex interplay of dimensions, including both improvements in functional exchanges and associational connections and a deterioration in emotional bonds. Furthermore, although no significant changes were observed in intergenerational relationships types, a mental health decline clearly leads to a significant reduction in emotional closeness and a marginal decrease in financial exchanges between parents and children.

Figure 6A and B presents the estimated coefficients of three types (presented in columns) of health declines on each dimension of the closest (fig. 6A) and the most distant (fig. 6B) parent-child types, respectively, for families with at least one daughter (Panel A) and without daughters (Panel B). Generally, both figure 6A and B indicate that families with at least one daughter are more responsive to physical and cognitive health declines compared to families without daughters. Figures of families with at least one daughter present more significant coefficients (also with a larger magnitude) for most dimensions compared to families without daughters. This finding presents corroborative evidence for our observation in figure 4 that intergenerational relationship types in families with at least one daughter are more likely to transition into a closer type compared to families without daughters. Specifically, in both figure 6A and B, for both the closest and most distant relationship types, we found that among families with at least one daughter, declines in a parent's physical and cognitive health lead to increased economic and housework support from children and more frequent in-person and online contacts. However, among families without daughters, we observed fewer significant changes in these dimensions.

It is important to note that the difference model can only estimate the average changes in each individual dimension across different types of the closest or most distant relationships,

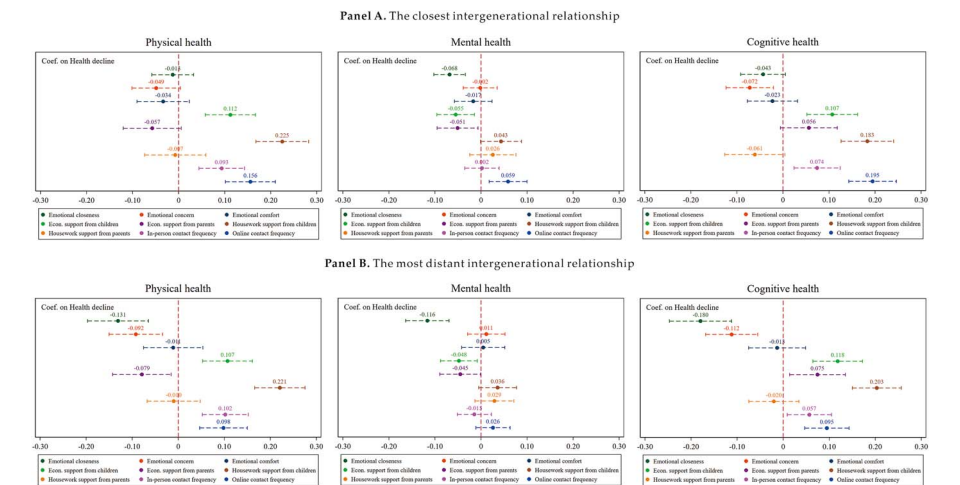


Figure 5. Effects of health declines on changes in different dimensions of the closest and most distant types of intergenerational relationships. Notes: Panel A (B) illustrates the effects of health declines on changes in nine indicators (detailed in Table 1) for the closest (most distant) intergenerational relationships, respectively. The three columns display the estimated coefficients for declines in physical, mental, and cognitive health, respectively. These estimates were derived using the difference model and the same covariates specified in equation (3). Dotted lines indicate 95 percent confidence intervals.

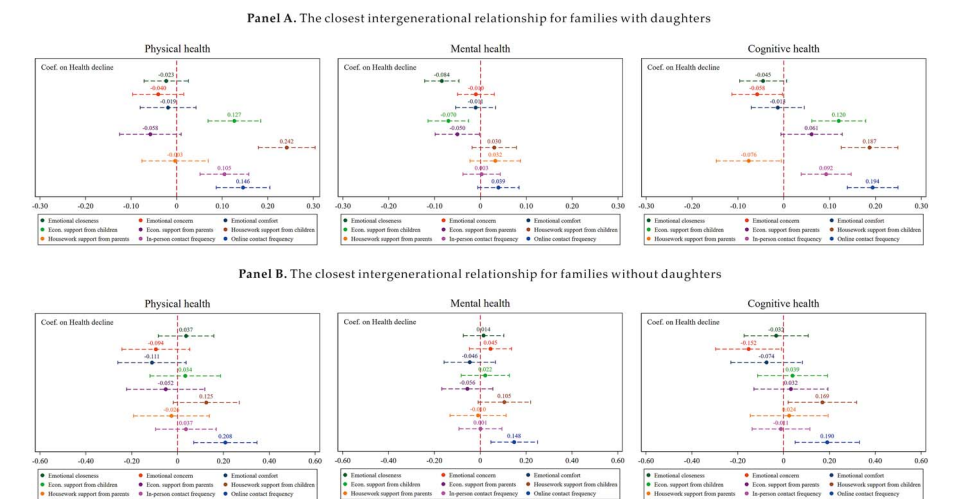


Figure 6. (A) Effects of health declines on changes in different dimensions of the closest intergenerational relationship by family gender structure. Notes: Panels A and B illustrate the effects of health declines on nine indicators (detailed in Table 1) of the closest intergenerational relationship for families with and without daughters, respectively. The three columns display the estimated coefficients for declines in physical, mental, and cognitive health, respectively. These estimates were derived using the difference model and the same covariates specified in equation (3). Dotted lines represent 95 percent confidence intervals.

thus preventing us from capturing the combined changes in various dimensions. For instance, while we have documented that older parents' health declines may on average increase functional exchanges of the most distant relationship type, we cannot conclude that all transitions between different types of the most distant relationships exhibit an increase in functional exchanges.⁹

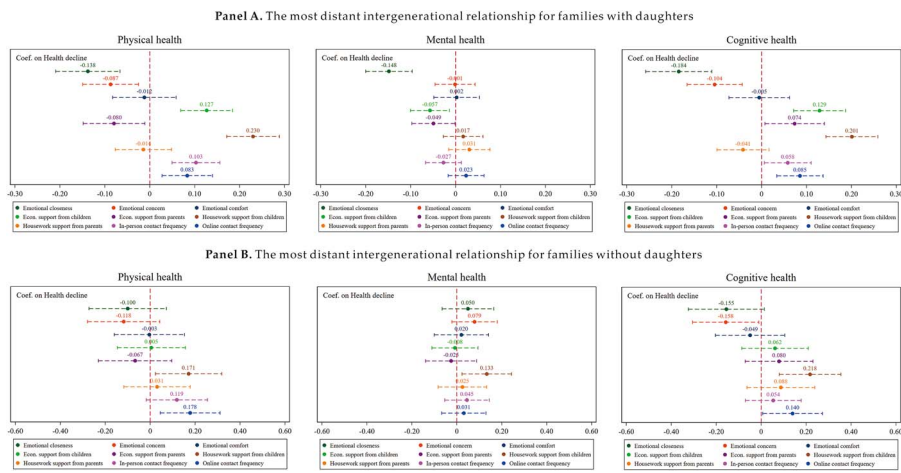


Figure 6. (B) Effects of health declines on changes in different dimensions of the most distant intergenerational relationship by family gender structure. Notes: Panels A and B illustrate the effects of health declines on nine indicators (detailed in Table 1) of the most distant intergenerational relationship for families with and without daughters, respectively. The three columns display the estimated coefficients for declines in physical, mental, and cognitive health, respectively. These estimates were derived using the difference model and the same covariates specified in equation (3). Dotted lines represent 95 percent confidence intervals.

Discussion

Using a nationally representative longitudinal dataset in China, this study investigated the changes in the patterns of intergenerational relationships in multi-child Chinese families following older parents' health declines and whether these changes differ by family gender structure. We adopted a fluid and flexible perspective to dynamically examine the changes in intergenerational relationships and employed a typological approach to comprehensively evaluate intergenerational relationships, retaining their multi-dimensional and ambivalent natures. Situated in a multi-child family context, we captured the varying changes in intergenerational relationship dyads following older parents' health declines. We also investigated families' potential gendered strategies in response to health declines, considering the evolving roles of daughters in old-age care in China. Additionally, we innovatively compared the varied responses of Chinese families to the physical, mental, and cognitive health declines. Our study reveals three key findings as follows.

First, parents' physical and cognitive health declines may lead to closer but more diverse patterns of intergenerational relationships. Specifically, the closest intergenerational relationship type was more likely to transition into the tight-knit one following physical and cognitive health declines, while the most distant type was more likely to demonstrate both independence (i.e., more independent) and divergence (i.e., closer or more alienated). The supplementary analysis suggests that the shift toward greater intimacy of the closest relationship is probably driven by increased functional exchanges and associational connections rather than improved emotional affinity; moreover, a substantial decrease in emotional affinity has been observed in the most distant relationships, indicating the existence of ambivalence. Prior studies have pointed out that caregiving is a complex process, where positive aspects such as fulfillment, and resilience and negative aspects such as emotional, physical, and financial burdens may co-exist and be intertwined (e.g., Lou, Gong, and Zang 2025), contributing to this ambivalence. In addition to the shift toward greater intimacy, the variations in intergenerational relationships have increased as a result of physical and cognitive health declines. This increase in variations is probably driven by a larger increase in the closest relationships than in the most distant relationships. Combining

these findings, we summarize that as the levels of closeness increase while the levels of similarity decrease, the patterns of intergenerational relationships may become more consolidated yet more diverse following parents' physical and cognitive health declines. Our first findings suggest that intergenerational relationships exhibit significant adaptability and flexibility in their structures, functions, and associations in response to older parents' physical and cognitive health declines; different dimensions and, subsequently, the patterns of intergenerational relationships have been actively modified to establish a new family equilibrium.

Second, intergenerational relationships are becoming closer yet more diverse as physical or cognitive health declines, particularly in families with daughters. Specifically, the closest (most distant) intergenerational relationship in families with daughters was more likely to shift into the tight-knit type (independent type) following a physical or cognitive health decline, compared to families without daughters. Supplementary analysis corroborates this finding, indicating that declines in physical and cognitive health result in increased economic and housework support from children, as well as more frequent in-person and online interactions among families with daughters. The significance of daughters in response to parents' health declines may be due to the rising importance of daughters in old-age support in contemporary China (Lei 2013). With the improvement in women's education and economic autonomy as well as a significant shift in gender ideologies, the traditional expectation of sons as old-age supporters is diminishing, while daughters, driven by emotional motivations and constrained by gender roles in caregiving are increasingly assuming a more significant role in taking care of older parents (Xie and Zhu 2009; Cong and Silverstein 2012; Hu 2017).

Third, unlike physical and cognitive health declines, intergenerational relationships are generally unresponsive to mental health declines in Chinese families. This finding aligns with prior evidence showing increased residential proximity to children following parental cardiovascular events (Choi et al. 2015) as well as functional limitations and cognitive impairment (Reyes and Shang 2024), but no significant change after heightened depressive symptoms (Jessee, Bordone, and Hank 2025). Supplementary analysis suggests that mental health declines lead to a significant reduction in emotional closeness, a marginal decrease in economic exchanges, and a slight increase in online-contact frequency; however, these changes have not resulted in significant transitions in intergenerational relationships types. Chinese unique cultural perspectives on mental health may help explain Chinese families' general indifference to mental health declines. In Confucianism, mental health issues are frequently linked to "moral contamination" and "genetic contamination," resulting in guilt and social stigma for both individuals and their families (Yang and Kleinman 2008). Moreover, Confucian culture places a strong emphasis on interpersonal harmony within families and the broader community. Declines in mental health may lead to Chinese parents' inability to meet cultural expectations or exhibit appropriate behaviors as family and community members, disrupting interpersonal harmony (Yang and Kleinman 2008). Due to these social pressure around mental issues, they may be less likely to be recognized as legitimate health concerns. Older parents may frequently conceal their mental issues from their adult children (Lee et al. 2005), and are also less likely to seek professional service and treatment (Lauber and Rössler 2007) motivated by both cultural stigma and a desire to avoid burdening offspring. Under this social context, adult children, even when aware of parental mental health deterioration, often perceive limited capacity to provide meaningful assistance, reflecting both structural barriers to mental health care (Lauber and Rössler 2007) and culturally mediated understandings of filial responsibility. Therefore, intergenerational relationships might be indifferent to mental health declines.

This study is subjective to several limitations. First, it is important to acknowledge that typological approaches represent an abstraction of the intricate intergenerational relationships within multi-child families and may not encapsulate all their nuances. To partially address this issue, this study offers a more specific depiction of parent-child interactions by investigating the changes in different dimensions of intergenerational relationships following older parents' health declines as a supplementary analysis. Second, the study only observes the patterns of relationship

changes, without delving into the intricate processes of coordination and negotiation among family members underlying these changes. Future research could enrich the understanding of the logic and processes of interactions by qualitative methods. Third, to address the missingness issue, we employed multiple imputation using chain equations to fill in the missing values and reran the main models, and most of the main results remain consistent (see Supplementary Appendix part A and Supplementary [figs A1](#) and [A2](#) for more details). Considering that the more disadvantaged have a higher attrition rate, our estimates could be conservative, as these parents are more likely to rely on their children for old-age support. Fourth, due to data limitations, our study could only examine family responses to older parents' health declines within a two-year observation window. Since long-term caregiving burdens can be detrimental to caregivers' mental health (e.g., [Lou, Gong, and Zang 2025](#)), with appropriate data available, we suggest that researchers revisit these examinations in the future. Fifth, families with only one child may respond differently to older parents' health declines because the intergenerational dynamic can be different. To address this selection issue, we have reanalyzed our main results focusing on families with only one child (see Supplementary Appendix part D, [Supplementary Table D1](#), and [Supplementary figs D1](#) and [D2](#) for more details), and the main findings are consistent.

Despite these limitations, the study offers important theoretical and practical insights. It contributes to our understanding of intergenerational relationships by highlighting their adaptive, flexible, and resilient features. These features are embedded within family networks and shaped by broader familial contexts and cultural norms. Families demonstrate agency by identifying and evaluating life events, strategically reconfiguring intergenerational relationships' structures, functions, and associations, and mobilizing latent resources in response to shifting demands, underscoring their fluid and resilient natures as social agents. The findings also suggest that China's long-standing patrilineal model in which sons are presumed to be primary caregivers is giving way to a more negotiated and collaborative arrangement, with daughters increasingly assuming indispensable roles. In light of China's relaxation of its longstanding and stringent one-child policy, developing a comprehensive understanding of intergenerational relationships may further illuminate their potential as vital resources for old-age care, particularly given the limited public long-term care infrastructure and the underdeveloped market for formal care services.

Endnotes

1. The provider role involves offering various forms of support to aging parents, while the mediator role includes significant but often overlooked cognitive and emotional efforts in managing changes across multiple areas—such as living arrangements, financial and caregiving support, and contact frequency.
2. Across four waves of the CLASS survey, multi-child households constitute the predominant (over 74 percent) family structure.
3. The CLASS survey team revised their technological design after 2016; therefore, the attrition rate in the 2014–2016 waves was relatively higher compared to later waves. To address this issue, we adopted a two-wave prospective design (e.g., 2014–2016, 2016–2018, and 2018–2020) rather than longer three-wave (e.g., 2014–2016–2018, 2016–2018–2020) or four-wave (e.g., 2014–2016–2018–2020) designs. This approach yielded 15,325 observations of older parents in multi-child families across two consecutive waves (including cases with missing values), compared to 7,015 for three waves and 1,648 for four waves. To maximize the available data, we combined the three sets of two-wave data into a mixed sample.
4. For robustness, we used multiple imputation by chained equations to address missing values in parent–child relationships, health status, and covariates across the 2014, 2016, 2018, and 2020 waves. The main findings remained consistent with those from the non-imputed datasets (see Supplementary Appendix part A and [Supplementary figs A1](#) and [A2](#), and [Table A1](#) for details).

5. We measured within-person declines in mental and cognitive health using (1) absolute percentage changes in CES-D and MMSE scores, and (2) clinically defined thresholds (CES-D $\geq 6/18$, MMSE $\leq 13/16$) to identify significant depressive symptoms and cognitive impairment (Weissman et al. 1977; Zhang et al. 2020). The results were robust to alternative health decline measures (see Supplementary Appendix part B and [Supplementary figs B1 and B2](#) for details).
6. Beyond shifting to a different type, intergenerational relationships may also show resilience by adapting in some ways while retaining their original type. To examine this, we conducted robustness checks (see Supplementary Appendix part C and [Supplementary figs C1 and C2](#) for details) comparing transition probabilities—specifically, shifts to a new type (higher off-diagonal probabilities) versus stability in the original type (higher diagonal probabilities). Results show that relationships were sensitive to physical and cognitive health declines, often changing type even after minor deterioration. In contrast, they were less sensitive to mental health declines, shifting type only after more severe decline. These robustness findings support our main conclusions.
7. The closest and most distant relationship types were identified based on the typology results for each parent–child dyad. Because relationship type is not continuous, standard deviation is not appropriate for measuring its variation. Instead, we used the IQV, a suitable metric for assessing variability in nominal variables.
8. The average marginal effect (average across individual observations) and the marginal effect at the mean (at covariate means) generally yield similar results, and our tests confirmed strong alignment between them.
9. For the most distant relationships, declines in parent's physical and cognitive health often shift them toward the independent type (marked by low functional exchanges and associational connections), seemingly conflicting with single-dimension analyses reporting increased functional exchanges and associational connections. This discrepancy stems from methodological differences. The single-dimension analysis quantifies average changes in specific dimensions, inherently weighted by transition probabilities. Therefore, the observed average change reflects both the magnitude shift in the focal dimension and the underlying transition probabilities. In contrast, the typological analysis examines the combined changes across all dimensions by comparing transition probabilities. While the two approaches yield seemingly different results, they are complementary: single-dimension analysis captures magnitude changes, while typological analysis reveals multi-dimensional changes.

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Supplementary Material

[Supplementary material](#) is available at *Social Forces* online.

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Conflicts of interest: None declared.

Data availability

The data underlying this article are available in the website of the China Longitudinal Aging Social Survey (CLASS), at <http://class.ruc.edu.cn/English/Home.htm>.

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