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# When Family Ties Do Not Translate into Support: Family Support Deficits and Later-Life Well-being in China

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# When Family Ties Do Not Translate into Support: Family Support Deficits and Later-Life Well-being in China

**Abstract**

Population ageing has intensified interest in how older adults access support as family structures and intergenerational arrangements change. Although family ties are important sources of later-life support, their presence does not necessarily indicate that supportive behaviors are realized. This study introduces family support deficit (FSD), defined as the non-realization of selected support behaviors within existing adult-child relationships, and examines its longitudinal association with life satisfaction among older adults in China.

Using four waves of the China Family Panel Studies (2016, 2018, 2020, and 2022), we analyzed 22,201 person-wave observations from 10,078 adults aged 60 years or older. Individual fixed-effects models assessed whether within-person changes in the Family Support Deficit Index (FSDI) were associated with changes in life satisfaction, and whether this association varied across support domains or by formal welfare coverage.

Higher FSDI scores were associated with lower life satisfaction within individuals ($b = -0.033$, $SE = 0.011$, $p = .003$), although the magnitude was small. Financial, caregiving, and emotional interaction deficits all had negative coefficients, but none reached conventional statistical significance when modeled simultaneously. Formal welfare coverage did not significantly moderate the FSDI association ($b = 0.029$, $SE = 0.019$, $p = .133$).

By distinguishing family relationship availability from realized support behaviors, this study extends research on intergenerational support and later-life well-being. The findings suggest that support environments should be assessed beyond family structure alone, while recognizing that FSD should not be interpreted as a measure of unmet need.

**Keywords** Family support deficit; Intergenerational support; Later-life well-being; Support realization; Formal welfare; China

## 1. Introduction

Population ageing is reshaping the organization of care, support, and intergenerational relationships across societies. As longevity increases and family structures become smaller and more geographically dispersed, a central question in ageing research is how older adults can access the relational resources needed to maintain well-being in later life. Family relationships remain a central component of informal support systems, particularly in societies where family-based care continues to play an important role (Agree & Glaser, 2009; Silverstein & Bengtson, 1994). However, the existence of family ties does not necessarily indicate that supportive functions are realized. Recent research on intergenerational relationships has increasingly moved

beyond the simple presence of family members toward examining how different forms of support and relational exchanges shape later-life outcomes (Silverstein et al., 2025).

Life satisfaction represents an important dimension of later-life well-being and reflects individuals' overall evaluation of their lives (Diener et al., 1985). Although ageing-related changes in health and functional ability may challenge well-being, later-life outcomes are shaped by multiple relational, personal, and institutional resources (Diener et al., 1985; Bowling, 2005). Among these resources, family relationships remain particularly important because they may provide economic, instrumental, and emotional support throughout later life. Understanding when and how family relationships generate actual support resources is therefore essential for explaining variations in older adults' life satisfaction, particularly in societies experiencing rapid demographic and family transitions.

Families provide older adults with multiple forms of support, including financial assistance, caregiving, and emotional connection. Intergenerational support has long been considered an important mechanism through which older adults maintain security, autonomy, and psychological well-being (Silverstein & Bengtson, 1994; Cong & Silverstein, 2008). However, family relationships and support behaviors represent different dimensions of social reality. Structural indicators, such as the presence of adult children, coresidence, or contact frequency, capture potential support networks but do not necessarily reveal whether supportive exchanges are actually realized.

The distinction between family relationships and realized support is consistent with the social convoy model, which conceptualizes social relations in terms of both their structural characteristics and the functions they provide across the life course (Kahn & Antonucci, 1980; Antonucci et al., 2014). From this perspective, social relationships constitute potential sources of support, but their contribution to well-being depends partly on whether they provide meaningful relational functions. Accordingly, the existence of adult-child relationships may indicate the availability of potential support resources, but does not necessarily demonstrate that specific supportive behaviors are observed.

This distinction has become increasingly important as demographic and social transformations reshape family-based care arrangements. Declining fertility, increased geographic mobility, migration, and changing household structures may weaken the previously assumed link between family membership and everyday support provision (Tian & Xu, 2020). Contemporary research on intergenerational relationships further emphasizes that support should be examined according to its type, direction, and relational context rather than solely through the existence of family ties (Silverstein et al., 2025). This issue is particularly relevant in China, where filial norms remain influential while family structures continue to transform. In this context, older adults with similar

family structures may nevertheless experience different levels of realized support, highlighting the need to examine how family relationships are translated into actual supportive behaviors.

Despite growing recognition of multidimensional family support, existing research has frequently relied on indicators of family availability rather than whether supportive behaviors actually occur. Measures such as family size, number of children, coresidence, or contact frequency provide valuable information about potential support environments but may overlook older adults who maintain family relationships while receiving limited financial assistance, caregiving, or emotional interaction. Conversely, the absence of a specific support behavior does not necessarily indicate unmet needs, because support provision depends on health conditions, economic circumstances, living arrangements, preferences, and alternative sources of assistance.

To address this conceptual limitation, this study introduces the concept of family support deficit (FSD), which captures the gap between existing adult-child relationships and observed support behaviors. Building on the distinction between relationship availability and support realization, FSD refers to situations in which selected forms of support are not observed despite the continued existence of intergenerational relationships. Importantly, FSD does not represent unmet needs, inadequate family relationships, or dissatisfaction with family ties; rather, it identifies the extent to which potential family-based resources are not translated into observable supportive exchanges. By distinguishing family availability from support realization, FSD provides a framework for understanding why older adults with similar family structures may experience different levels of later-life well-being.

Building on this framework, the present study examines whether changes in family support deficits are associated with changes in later-life well-being. Using four waves of the China Family Panel Studies (CFPS) from 2016, 2018, 2020, and 2022, we construct a longitudinal panel of older adults and apply individual fixed-effects models to examine within-person associations between family support deficits and life satisfaction (Xie & Hu, 2014). Specifically, this study addresses three questions: (1) whether changes in FSD correspond to changes in life satisfaction; (2) whether a broader pattern of deficits across multiple family support domains provides additional explanatory value beyond isolated support domains; and (3) whether formal welfare coverage moderates the association between family support deficits and later-life well-being.

This study makes three contributions. First, it advances research on intergenerational support by shifting analytical attention from family availability to support realization. By distinguishing family relationships from realized support behaviors, it extends previous approaches that have often emphasized structural indicators of family availability while paying less attention to whether supportive functions are actually realized (House et al., 1988; Thoits, 2011). Second, it provides longitudinal evidence using nationally representative panel data and individual fixed-effects

models to examine how within-person changes in family support deficits relate to changes in later-life well-being. Third, it contributes to discussions on changing family-based welfare arrangements by examining whether formal welfare coverage buffers the consequences associated with unrealized family support. Although the empirical analysis focuses on China, the conceptual distinction between family ties and realized support is relevant to societies where families continue to play important roles in later-life support provision.

## 2. Theoretical Framework and Hypotheses

### 2.1 Family Support Deficit: From Family Ties to Support Realization

Family relationships have traditionally been regarded as an important source of support throughout later life. The intergenerational solidarity perspective conceptualizes parent–adult child relationships as multidimensional bonds involving structural connections, interaction, emotional closeness, normative obligations, and functional exchanges (Bengtson & Roberts, 1991). Among these dimensions, functional solidarity reflects the extent to which intergenerational relationships provide practical and emotional resources that may contribute to older adults' security, adaptation, and psychological well-being (Silverstein & Bengtson, 1997). Empirical research using Chinese samples has likewise shown that intergenerational support and adult children's characteristics are closely associated with older adults' well-being, although the strength and pathways of these associations vary across different forms of support and family contexts (Zheng et al., 2023; Jiang et al., 2024).

However, the existence of family relationships does not necessarily indicate that supportive resources are actually available or realized. Social support research has long distinguished between the structural existence of social relationships and the functional realization of support exchanges (House et al., 1988; Thoits, 2011). This distinction is also central to the social convoy model, which views individuals as embedded in evolving networks of social relationships across the life course and emphasizes both the structural characteristics of these relationships and the functions they provide (Kahn & Antonucci, 1980; Antonucci et al., 2014). From this perspective, the presence of adult children represents a potential source of support, but family membership alone does not establish that financial, instrumental, or socioemotional support is actually realized.

This structural–functional distinction is particularly important in contemporary ageing societies. Demographic change, geographic mobility, declining fertility, migration, and evolving intergenerational arrangements may weaken the correspondence between family membership and everyday support provision. Recent evidence from China suggests that although intergenerational relationships remain important for older adults' well-being, the link between family connections and actual support outcomes is not always straightforward (Zheng et al., 2023; Tan et al., 2023).

Understanding later-life support therefore requires moving beyond whether family relationships exist toward examining whether those relationships generate observable supportive exchanges.

Building on this perspective, this study introduces the concept of family support deficit (FSD) to capture the gap between family relationship availability and realized support behaviors. FSD refers to situations in which selected support behaviors are not observed despite the continued existence of adult-child relationships. Specifically, it identifies the non-realization of financial assistance, caregiving support, or emotional interaction within existing intergenerational relationships.

The term "deficit" refers specifically to a deficit in support realization rather than a deficit in individual need, family relationships, or relational quality. Existing family ties may contain potential supportive resources, but these resources are not always converted into observable exchanges. FSD therefore captures the extent to which potentially available family-based resources are not reflected in observed support behaviors. This conceptualization does not imply that all absent support behaviors represent inadequate family relationships, dissatisfaction with family ties, or unmet needs.

This distinction is particularly important because the absence of a specific support behavior may have different meanings under different circumstances. No financial transfer may reflect economic independence rather than financial hardship, and no caregiving may reflect the absence of current care needs rather than unavailable assistance. Similarly, infrequent interaction does not necessarily indicate poor relationship quality. FSD should therefore be interpreted as a behavioral indicator of support non-realization rather than as a direct measure of deprivation or unmet need.

The conceptual contribution of FSD lies in linking the distinction between relationship structure and support function to observable intergenerational support behaviors. Rather than assuming that family availability is equivalent to accessible support, FSD makes it possible to examine whether existing adult-child relationships generate observable support across different domains. This distinction provides a framework for understanding why older adults with broadly similar family structures may nevertheless experience different support environments and levels of later-life well-being.

Accordingly, we propose:

Hypothesis 1 (H1): Higher levels of family support deficit are associated with lower levels of later-life well-being among older adults.

2.2 Multidomain Family Support Deficit as Restricted Access to Family Resources: A Conservation of Resources Perspective

While the social convoy perspective helps explain why the existence of family relationships should be distinguished from the support functions they provide, Conservation of Resources

(COR) theory offers a complementary explanation for why broader restrictions in access to family-based resources may be associated with later-life well-being. COR theory proposes that individuals seek to acquire, maintain, and protect resources that are valuable for adaptation and psychological stability, and that reduced well-being may emerge when access to valued resources becomes constrained (Hobfoll, 1989).

From a COR perspective, family relationships may provide several forms of potentially valuable resources in later life. Financial assistance can contribute to economic security, caregiving support may facilitate everyday functioning and adaptation to health limitations, and emotional interaction may reinforce social connectedness and relational security (Cohen & Wills, 1985; Uchino, 2004). These forms of support represent analytically distinct resource pathways rather than interchangeable indicators of a single underlying construct.

Recent studies of older adults in China similarly indicate that financial assistance, caregiving, and emotional interaction are associated with different aspects of psychological and social well-being (Jiang et al., 2024; Liu & Bai, 2024). Much of this literature, however, has focused on the benefits of received support or examined individual support domains separately. Less attention has been paid to whether the breadth of support non-realization across several domains may provide additional information about older adults' family resource environments.

Older adults may draw on several forms of family support simultaneously when responding to later-life challenges. When support is not realized in one domain, other family-based or external resources may remain available. In contrast, when support is not observed across a broader range of domains, older adults may have access to fewer family-based resource pathways, potentially increasing vulnerability to economic, functional, and psychological challenges.

Importantly, this multidomain perspective does not imply a simple additive, interactive, or synergistic effect among support deficits. The Family Support Deficit Index (FSDI) captures the breadth of support domains in which observable support is not realized. A broader pattern of support non-realization may indicate more restricted access to family-based resources than the absence of support in only one domain, without requiring the assumption that the domains have equal effects or that resource loss accumulates mechanically over time.

This interpretation is consistent with COR theory in emphasizing the importance of access to multiple resources, but the present study does not directly measure cumulative resource loss over time. Nor does it establish whether deficits across different support domains interact with one another. Accordingly, FSDI should be interpreted as a multidomain indicator of restricted support realization rather than as evidence of a cumulative resource-loss mechanism.

The multidomain perspective also provides a rationale for examining whether the overall FSDI association can be attributed to a single dominant support domain. If the association between

FSDI and well-being is not clearly driven by financial, caregiving, or emotional interaction deficits considered individually, this would be consistent with the possibility that the breadth of support non-realization provides information beyond any one isolated domain. Such evidence, however, should be interpreted as support for a multidomain pattern rather than proof of cumulative or synergistic effects.

Accordingly, we propose:

Hypothesis 2 (H2): A broader pattern of family support deficits across multiple support domains is associated with lower levels of later-life well-being among older adults.

2.3 Formal Welfare as an Institutional Buffer

Family-based resources are embedded within broader institutional arrangements that shape how older adults manage later-life challenges. Welfare regime perspectives emphasize that responsibility for later-life security and care is distributed across families, markets, and states, with different societies relying on different combinations of familial and institutional support arrangements (Esping-Andersen, 1999). The consequences associated with limited family support may therefore depend partly on whether alternative institutional resources are available.

In rapidly ageing societies, formal welfare systems have become increasingly important sources of economic protection, healthcare access, and care-related support. Public pensions, health insurance, long-term care programs, and formal services may provide alternative pathways through which older adults obtain resources that would otherwise be supplied partly through families. Recent research in China suggests that although intergenerational support remains central to older adults' well-being, demographic change and shifting family structures have increased the importance of institutional arrangements in later-life security (Zheng et al., 2023; Wang & Ngok, 2024).

Evidence from China also suggests that formal welfare and family support do not necessarily operate as simple substitutes. Long-term care insurance and other formal care arrangements may reshape family caregiving and intergenerational financial exchanges rather than eliminate family involvement altogether (Wang & Liu, 2024). More broadly, previous research has suggested that formal and informal support may substitute for, complement, or specialize in different functions depending on the institutional and family context.

Formal welfare may be particularly effective in addressing material vulnerabilities, including income insecurity, medical expenses, and access to formal services. However, institutional resources may be less able to reproduce relational functions embedded in family relationships, such as companionship, emotional connection, trust, and belonging. Formal and informal resources may therefore overlap in some areas while remaining functionally distinct in others.

From a COR perspective, formal welfare can be understood as an alternative resource reservoir that may reduce the extent to which broader family support deficits are associated with lower well-being. When support is not realized across multiple family support domains, pensions, health insurance, or other institutional resources may partially compensate for restricted access to family-based resources. Nevertheless, because formal and informal support provide partly distinct forms of assistance, welfare coverage may not necessarily offset the association between limited family support realization and later-life well-being.

This issue is particularly relevant in China, where family responsibility remains deeply embedded in later-life support arrangements while formal welfare institutions continue to expand. Examining whether formal welfare coverage moderates the association between family support deficits and well-being therefore provides a way to assess whether institutional resources alter the consequences associated with limited realization of family support.

At the same time, the present study measures the breadth of formal welfare coverage rather than the generosity, adequacy, accessibility, or quality of specific welfare benefits. The proposed buffering effect should therefore be understood as an empirical hypothesis rather than an assumption that formal welfare necessarily substitutes for or compensates for family support.

Accordingly, we propose:

Hypothesis 3 (H3): Formal welfare coverage moderates the association between family support deficit and later-life well-being, such that the negative association between broader family support deficits and well-being is weaker among older adults with greater welfare coverage.

## 3. Data and Methods

### 3.1 Data Source and Analytical Sample

This study uses data from the China Family Panel Studies (CFPS), a nationally representative longitudinal survey designed to capture social, economic, demographic, and health-related changes among Chinese individuals and households. CFPS provides detailed information on family relationships, intergenerational exchanges, socioeconomic conditions, and subjective well-being, making it suitable for examining how changes in family support environments are associated with later-life outcomes.

We used multiple waves of CFPS data to construct an unbalanced panel dataset of older adults. The analytical sample was restricted to respondents who were aged 60 years or older and had at least one living adult child, because family support deficits are conceptually defined based on the gap between existing family relationships and realized support behaviors. Respondents without valid information on key variables were excluded.

The longitudinal structure of CFPS allows us to examine whether within-person changes in family support deficits are associated with corresponding changes in later-life well-being while controlling for time-invariant individual characteristics.

### 3.2 Measures

#### 3.2.1 Later-life Well-being

Later-life well-being was measured using respondents' reported life satisfaction. Following previous studies using CFPS data, respondents were asked to evaluate their overall satisfaction with life on a five-point scale ranging from 1 ("very dissatisfied") to 5 ("very satisfied"). Higher values indicate greater levels of subjective well-being.

#### 3.2.2 Family Support Deficit Index

Family support deficit (FSD) was operationalized as the non-realization of selected observable support behaviors from adult children among older adults who had at least one living adult child. The measure therefore captures whether potentially available intergenerational support was observed, rather than whether respondents experienced unmet needs or judged their support to be inadequate. In contrast, unmet care need generally refers to a situation in which a need for care or services exists but is not adequately met (Kim et al., 2024).

Three dimensions of family support deficit were identified based on available CFPS measures:

(1) Financial support deficit indicates the absence of financial transfers or monetary assistance from adult children.

(2) Caregiving support deficit indicates the absence of practical assistance or caregiving support provided by adult children.

(3) Emotional interaction deficit indicates the absence of regular emotional interaction or contact with adult children.

For each dimension, respondents were coded as experiencing a support deficit when the corresponding support behavior was absent. Because support may be provided by any member of the family network, support was considered available if at least one adult child provided the relevant form of assistance. This approach captures whether the family network generated an observable support resource rather than evaluating support behavior at the individual child level.

The Family Support Deficit Index (FSDI) was constructed by summing the three domain-specific indicators, ranging from 0 to 3. Higher values indicate that support was not observed in a greater number of domains. The index is treated as a formative indicator of multidomain support non-realization rather than as a reflective scale, because its component indicators represent distinct support functions that jointly define the breadth of support non-realization (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). Accordingly, FSD should not be

interpreted as objective deprivation, unmet need, poor family relationships, or evidence that a respondent desired each form of support that was not observed.

### 3.2.3 Formal Welfare Coverage Index

Formal welfare coverage was measured using indicators of institutional protection available to older adults. Specifically, we constructed the Formal Welfare Coverage Index (FWCI) based on respondents' coverage of major formal welfare programs, including pension and health insurance participation.

The FWCI reflects the breadth of formal welfare protection available to individuals. It does not capture the intensity, generosity, or quality of welfare services but represents the extent to which older adults are covered by formal institutional resources.

### 3.2.4 Covariates

Time-varying covariates included marital status, years of education, self-rated health, and urban residence. Married or cohabiting respondents were coded as 1, higher self-rated health scores indicated better health, and urban residence was coded as 1. Age was included in the pooled OLS and random-effects models but was not separately estimated in the fixed-effects models because it is perfectly collinear with individual and survey-wave fixed effects. Gender and other time-invariant characteristics were absorbed by the individual fixed effects.

## 3.3 Analytical Strategy

First, descriptive statistics were calculated to summarize sample characteristics and distributions of key variables. To examine the association between family support deficit and later-life well-being, we estimated individual fixed-effects models:

$$Well - being_{it} = \beta FSD_{it} + \gamma X_{it} + \alpha_i + \lambda_t + \epsilon_{it}$$

where $i$represents individuals and $t$represents survey waves. The individual fixed effects ($\alpha_i$) control for time-invariant characteristics, while wave fixed effects ($\lambda_t$) account for common temporal changes. The coefficient of interest captures whether within-person changes in family support deficit are associated with within-person changes in life satisfaction.

For Hypothesis 2, we examined whether the association between family support deficit and later-life well-being reflected the breadth of support non-realization across multiple domains. The FSDI captures the number of domains in which support was not observed. Additional models including domain-specific deficits were estimated to assess whether the overall association was attributable to a single support domain or was more consistent with a multidomain pattern. Supplementary categorical specifications further examined whether the association differed across FSDI levels.

For Hypothesis 3, moderation models were estimated by introducing an interaction term between FSDI and FWCI:

$$Well - being_{it} = \beta_1 FSD_{it} + \beta_2 FWCI_{it} + \beta_3 (FSD_{it} \times FWCI_{it}) + \gamma X_{it} + \alpha_i + \lambda_t + \epsilon_{it}$$

A significant interaction coefficient would indicate that formal welfare coverage modifies the association between family support deficits and later-life well-being. Marginal effects were further estimated to illustrate the association between FSD and well-being at different levels of formal welfare coverage.

Several robustness analyses were conducted. Alternative specifications of FSD, including proportion-based and categorical measures, were examined. Additional analyses explored whether specific welfare components produced different patterns of association. Other robustness checks, including alternative outcome specifications and subgroup analyses, are reported in the Supplementary Materials.

## 4.Results

### 4.1 Sample Characteristics and Within-Person Variation

Table 1 presents the descriptive statistics of the analytical sample. The final sample consisted of 10,078 older adults aged 60 years or above, contributing 22,201 person-wave observations across the 2016, 2018, 2020, and 2022 waves of the China Family Panel Studies (CFPS). All respondents had at least one adult child and complete information on the focal variables included in the main models.

As shown in Table 1, the mean level of life satisfaction was 4.127 (SD = 0.960) on a five-point scale. The mean Family Support Deficit Index (FSDI) was 1.044 (SD = 0.828), indicating that older adults experienced, on average, the absence of observable family support behaviors in approximately one of the three assessed domains. Among the three dimensions, caregiving support deficit was the most prevalent (57.8%), followed by financial support deficit (41.8%) and emotional interaction deficit (4.8%). Formal welfare coverage was relatively widespread, with the mean Formal Welfare Coverage Index (FWCI) reaching 1.697 (SD = 0.520); pension coverage and health-insurance coverage were 76.8% and 92.9%, respectively.

Because the main analyses rely on individual fixed-effects (FE) models, identification depends on within-person changes over time rather than differences between individuals. Therefore, we further examined temporal variation among respondents with at least two valid observations. As reported in Table 2, 6,793 respondents contributed multiple observations. During the observation period, life satisfaction changed for 67.2% of these respondents, while FSDI changed for 67.5%, suggesting substantial within-person variation for estimating longitudinal associations. Financial support deficit and caregiving support deficit changed for 45.0% and 46.5% of multiwave respondents, respectively. In contrast, emotional interaction deficit showed less variation, changing for only 8.9% of respondents.

The relatively limited temporal variation of emotional interaction deficit is important for interpreting subsequent estimates, as coefficients associated with less frequently changing variables may be estimated with lower precision. The within-person variation analysis therefore supports the use of FE models while also clarifying the empirical constraints of specific support domains.

**Table 1** Descriptive Statistics of Analytical Variables

| Variable | Mean | SD | Minimum | Maximum |
|---|---|---|---|---|
| Life satisfaction | 4.127 | 0.960 | 1 | 5 |
| Family Support Deficit Index (FSDI) | 1.044 | 0.828 | 0 | 3 |
| Financial support deficit | 0.418 | 0.493 | 0 | 1 |
| Caregiving support deficit | 0.578 | 0.494 | 0 | 1 |
| Emotional interaction deficit | 0.048 | 0.214 | 0 | 1 |
| Formal Welfare Coverage Index (FWCI) | 1.697 | 0.520 | 0 | 2 |
| Pension coverage | 0.768 | 0.422 | 0 | 1 |
| Health-insurance coverage | 0.929 | 0.257 | 0 | 1 |
| Married or cohabiting | 0.848 | 0.359 | 0 | 1 |
| Years of education | 5.299 | 4.615 | 0 | 19 |
| Self-rated health | 2.530 | 1.228 | 1 | 5 |
| Urban residence | 0.485 | 0.500 | 0 | 1 |
| Age | 68.120 | 6.190 | 60 | 98 |

**Note.** The analytical sample includes 10,078 individuals and 22,201 person-wave observations. FSDI ranges from 0 to 3 and FWCI ranges from 0 to 2. Binary variables are coded as 0/1. Higher self-rated health scores indicate better health.

**Table 2** Within-person variation in the core variables among respondents with at least two observations (n = 6,793)

| Variable | Within-person SD | Changed at least once, n | Changed, % |
|---|---|---|---|
| Life satisfaction | 0.650 | 4,564 | 67.2 |
| Family Support Deficit Index (FSDI) | 0.532 | 4,582 | 67.5 |
| Financial support deficit | 0.327 | 3,055 | 45.0 |
| Caregiving support deficit | 0.333 | 3,159 | 46.5 |
| Emotional interaction deficit | 0.144 | 605 | 8.9 |
| Formal Welfare Coverage Index (FWCI) | 0.364 | 3,084 | 45.4 |
| Pension coverage | 0.295 | 2,537 | 37.3 |
| Health-insurance coverage | 0.188 | 1,041 | 15.3 |

**Note.** The analysis is restricted to 6,793 respondents with at least two valid observations. The within-person standard deviation measures temporal variation around each respondent's own mean. "Changed at least once" indicates that a respondent had at least two different values during the observation period. The denominator for the percentage changed is 6,793. Financial support deficit, caregiving support deficit, emotional interaction deficit, pension coverage, and health-insurance coverage are binary variables.

### 4.2 Family Support Deficit and Later-life Well-being

Before examining the association between family support deficit and later-life well-being, we compared pooled ordinary least squares (OLS), random-effects (RE), and individual fixed-effects (FE) specifications. The Hausman test rejected the null hypothesis that individual effects were

uncorrelated with the explanatory variables ($\chi^2$ = 150.16, p < .001), supporting the use of FE models as the primary specification. All models included survey-wave fixed effects and individual-clustered robust standard errors.

The results of the main regression models are presented in Table 3. In the pooled OLS and RE models, FSDI was negatively associated with life satisfaction (OLS: b = −0.073, p < .001; RE: b = −0.063, p < .001). After controlling for all time-invariant individual characteristics through FE estimation, the association remained statistically significant but was attenuated (b = −0.033, SE = 0.011, p = .003). This indicates that, within the same older adult, increases in the number of support domains in which observable family support was not realized were associated with small declines in life satisfaction.

The magnitude of the FE coefficient was smaller than those estimated from OLS and RE models, suggesting that some between-person differences in family background, socioeconomic circumstances, health, or other stable characteristics contributed to the cross-sectional association. However, the FE estimate remained negative and statistically significant after accounting for such time-invariant heterogeneity. These findings are consistent with H1, indicating that a greater breadth of family support deficits is longitudinally associated with lower later-life well-being.

Among the covariates, improvements in self-rated health showed a robust positive association with life satisfaction in the FE model (b = 0.065, SE = 0.009, p < .001). Other time-varying covariates included in the model did not reach statistical significance at the conventional 5% level.

**Table 3** Longitudinal Associations between Family Support Deficit, Formal Welfare Coverage, and Later-life Well-being

| Variable | (1) OLS | (2) RE | (3) FE | (4) FE + interaction |
|---|---|---|---|---|
| Family Support Deficit Index | -0.073*** | -0.063*** | -0.033** | -0.083* |
| (FSDI) | (0.008) | (0.008) | (0.011) | (0.036) |
| Formal Welfare Coverage Index | 0.071*** | 0.049*** | -0.002 | -0.033 |
| (FWCI) | (0.013) | (0.013) | (0.017) | (0.026) |
| Married or cohabiting | 0.104*** | 0.105*** | 0.045 | 0.045 |
| | (0.022) | (0.022) | (0.075) | (0.075) |
| Years of education | -0.012*** | -0.010*** | 0.000 | 0.001 |
| | (0.002) | (0.002) | (0.009) | (0.009) |
| Self-rated health | 0.142*** | 0.123*** | 0.065*** | 0.065*** |
| | (0.006) | (0.005) | (0.009) | (0.009) |
| Urban residence | 0.025† | 0.031* | 0.072 | 0.072 |
| | (0.015) | (0.015) | (0.054) | (0.054) |
| Age | 0.013*** | 0.012*** | — | — |
| | (0.001) | (0.001) | | |
| FSDI × FWCI | — | — | — | 0.029 |
| | | | | (0.019) |
| Individual fixed effects | No | No | Yes | Yes |
| Wave fixed effects | Yes | Yes | Yes | Yes |
| Observations | 22,201 | 22,201 | 22,201 | 22,201 |
| $R^2$ / within $R^2$ | 0.081 | 0.070 | 0.074 | 0.074 |

**Note.** Cluster-robust standard errors at the individual level are reported in parentheses. All models include survey-wave fixed effects. OLS and RE models include age; age is not separately estimated in FE models because it is perfectly collinear with individual and wave fixed effects. †p < .10. *p < .05. **p < .01. ***p < .001.

### 4.3 Beyond Individual Domains: The Multidomain Pattern of Family Support Deficits

The Family Support Deficit Index (FSDI) was designed to capture the breadth of support non-realization across three family support domains. To assess whether its overall association with life satisfaction was primarily attributable to one specific domain or reflected a broader pattern across domains, we estimated fixed-effects models in which financial support deficit, caregiving support deficit, and emotional interaction deficit were entered simultaneously. The results are presented in Table 4.

Across the domain-specific estimates, all three coefficients were negative. However, none reached conventional statistical significance when modeled simultaneously. Financial support deficit showed a negative but statistically nonsignificant association with life satisfaction (b = −0.029, SE = 0.018, p = .116). Caregiving support deficit was also negative and approached, but did not reach, conventional statistical significance (b = −0.034, SE = 0.018, p = .052). Emotional interaction deficit likewise had a negative coefficient, although the estimate was imprecise because of limited within-person variation (b = −0.048, SE = 0.044, p = .277).

We further tested whether the estimated associations differed across support domains. Pairwise comparisons indicated no statistically significant differences between financial and caregiving support deficits (p = .829), financial and emotional interaction deficits (p = .688), or caregiving and emotional interaction deficits (p = .777). The joint equality test likewise failed to detect differences among the three coefficients (F(2, 10,077) = 0.09, p = .917).

Taken together, these results indicate that the association between the overall FSDI and life satisfaction cannot be clearly attributed to any single support domain. Instead, the findings are consistent with a broader multidomain pattern in which the extent of support non-realization across several domains may provide information beyond that captured by any one domain considered separately. However, the analysis does not establish additive, interactive, or synergistic effects across support domains, nor does it directly measure cumulative resource loss over time. The results should therefore be interpreted as evidence of a multidomain pattern rather than as proof of a cumulative resource-loss mechanism.

The limited within-person variation in emotional interaction deficit also warrants caution. Because relatively few respondents changed status on this measure over time, its independent longitudinal association was estimated with lower precision. The absence of statistical significance should therefore not be interpreted as evidence that emotional interaction plays no role in later-life well-being.

**Table 4** Domain-specific Associations between Family Support Deficits and Later-life Well-being

| Variable | Main model (FE) | Component model (FE) | Interaction model (FE) |
|---|---|---|---|
| FSDI | -0.033**<br>(0.011) | — | -0.083*<br>(0.036) |
| Financial support deficit | — | -0.029<br>(0.018) | — |
| Caregiving support deficit | — | -0.034†<br>(0.018) | — |
| Emotional interaction deficit | — | -0.048<br>(0.044) | — |
| FSDI × FWCI | — | — | 0.029<br>(0.019) |
| Formal Welfare Coverage Index | -0.002<br>(0.017) | -0.002<br>(0.017) | -0.033<br>(0.026) |
| Married or cohabiting | 0.045<br>(0.075) | 0.045<br>(0.075) | 0.045<br>(0.075) |
| Years of education | 0.000<br>(0.009) | 0.001<br>(0.009) | 0.001<br>(0.009) |
| Self-rated health | 0.065***<br>(0.009) | 0.065***<br>(0.009) | 0.065***<br>(0.009) |
| Individual fixed effects | Yes | Yes | Yes |
| Wave fixed effects | Yes | Yes | Yes |
| Observations | 22,201 | 22,201 | 22,201 |
| Within $R^2$ | 0.074 | 0.074 | 0.074 |
| Financial vs. caregiving (p value) | — | 0.829 | — |
| Financial vs. emotional interaction (p value) | — | 0.688 | — |
| Caregiving vs. emotional interaction (p value) | — | 0.777 | — |
| Joint test of equal coefficients | — | F(2, 10,077) = 0.09<br>p = .917 | — |

**Note.** Cluster-robust standard errors at the individual level are shown in parentheses. All models include survey-wave fixed effects, marital status, years of education, self-rated health, and urban residence. Emotional interaction deficit occurred in 4.8% of the pooled sample, and only 8.9% of multiwave respondents changed status, contributing to comparatively limited precision. †p < .10. *p < .05. **p < .01. ***p < .001.

### 4.4 Formal Welfare Coverage as an Institutional Context

Hypothesis 3 examined whether formal welfare coverage modified the association between family support deficits and later-life well-being. The interaction model reported in Table 3 did not provide statistically significant evidence that formal welfare coverage altered the relationship between FSDI and life satisfaction (b = 0.029, SE = 0.019, p = .133). Thus, H3 was not supported.

To further illustrate the pattern of moderation, conditional associations between FSDI and life satisfaction were estimated across different levels of formal welfare coverage. As reported in Supplementary Table S1, the estimated association became progressively less negative as FWCI increased: the conditional slope of FSDI was −0.083 among individuals with no formal welfare coverage, −0.054 among those with partial coverage, and −0.025 among those with full coverage.

However, because the interaction coefficient was not statistically significant, these differences should be interpreted as descriptive patterns rather than confirmed moderation effects.

Taken together, the findings suggest that the breadth of formal welfare coverage, as measured by pension and health-insurance participation, did not provide statistically detectable evidence of buffering the association between family support deficits and later-life well-being. This result should not be interpreted as indicating that formal welfare is unimportant, but rather that coverage alone may not fully capture the adequacy, accessibility, or functional relevance of institutional resources available to older adults.

**4.5 Robustness and Exploratory Analyses**

Several additional analyses were conducted to examine the robustness and contextual boundaries of the main findings.

First, alternative operationalizations of family support deficit produced results consistent with the primary analysis. When FSDI was specified using the proportion-based measure rather than the original count-based index, the association with life satisfaction remained negative and statistically significant ($b = -0.049$, $SE = 0.013$, $p < .001$). Categorical specifications of FSDI also showed that higher levels of family support deficit were generally associated with lower life satisfaction, although the pattern did not display a strictly monotonic gradient. These results are reported in Supplementary Table S2.

Second, decomposing the Formal Welfare Coverage Index into pension and health-insurance coverage produced no statistically significant direct association for either component, while the FSDI coefficient remained negative and statistically significant. These analyses should be interpreted as robustness checks of the welfare specification rather than as tests of component-specific moderation. The results are also reported in Supplementary Table S2.

Third, additional outcome specifications yielded patterns consistent with the main fixed-effects results. A pooled ordered logit model and a conditional fixed-effects binary logit model both produced negative associations between family support deficit and later-life well-being, further supporting the directional robustness of the main finding. Because these models use different outcome scales and estimation frameworks, coefficient magnitudes were not directly compared across specifications. These results are reported in Supplementary Table S2.

Finally, exploratory analyses examined whether the association between family support deficit and life satisfaction differed between rural and urban older adults. As reported in Supplementary Table S3, the association remained negative in both rural and urban subsamples. However, the interaction between FSDI and urban residence was not statistically significant ($b = 0.014$, $SE = 0.021$, $p = .499$), indicating no statistically detectable urban–rural heterogeneity in the association. These subgroup findings should therefore be interpreted cautiously, as differences in statistical

significance across rural and urban models do not by themselves establish differences in coefficients.

## 5. Discussion

### 5.1 From Family Availability to Support Realization in Later Life

The principal finding of this study is that increases in family support deficit were associated with declines in life satisfaction within the same older adult. This result is consistent with previous evidence linking intergenerational support and family resources to later-life well-being in China (Wu, 2022; Zhan et al., 2025; Zhou et al., 2018), as well as evidence from other settings showing that available social support and social connectedness are associated with more favorable evaluations of later life (Çebi Karaaslan et al., 2026). The magnitude of the association was small, however, indicating that FSD represents one component of the broader set of health, economic, relational, and institutional factors shaping life satisfaction.

The finding also reinforces an important distinction between family availability and support realization. In line with the social convoy model, social relationships should be understood not only in terms of their structural characteristics but also in terms of the functions they provide across the life course (Kahn & Antonucci, 1980; Antonucci et al., 2014). Having adult children therefore indicates the existence of potential relational resources, but does not establish that specific forms of support are actually provided. The present findings extend this structural–functional distinction by showing that changes in the breadth of observable support non-realization within existing adult-child relationships are associated with changes in life satisfaction.

This interpretation is also consistent with evidence that potential support networks and realized support do not always coincide. Research on informal care has shown that older adults' well-being depends not only on whether potential caregivers are available but also on whether care is actually received and fits the individual's circumstances (Abramowska-Kmon et al., 2023). In China, migration, geographic separation, changing household structures, and constraints on caregiving capacity may further weaken the correspondence between the existence of intergenerational ties and the realization of everyday support (Tian & Xu, 2020; Huang & Chang, 2020).

FSD therefore adds a functional dimension to conventional indicators of family structure. Measures such as the number of children, coresidence, or family-network availability remain important for identifying potential sources of support, but they cannot by themselves establish whether financial assistance, caregiving, or emotional interaction is observed. The contribution of FSD lies in making this distinction empirically visible within existing intergenerational relationships.

At the same time, the concept should be interpreted within clear boundaries. FSD measures observable support behaviors rather than subjective need, expectations, support adequacy, or relationship quality. The absence of a particular behavior may reflect a lack of corresponding need, the availability of alternative resources, or preferences regarding support arrangements. Accordingly, the observed association should not be interpreted as evidence that every instance of non-realized support represents deprivation or family failure.

The fixed-effects design further strengthens this interpretation by focusing on within-person change and absorbing stable individual characteristics that may jointly influence family support and well-being. The smaller FE coefficient relative to pooled OLS and random-effects estimates suggests that part of the between-person association reflects stable heterogeneity. Nevertheless, fixed-effects models do not eliminate reverse association, time-varying confounding, or measurement error. The results should therefore be interpreted as longitudinal within-person associations rather than causal effects.

### 5.2 Multidomain Patterns of Family Support Deficit and Later-Life Well-being

A second contribution of this study is highlighting that family support deficit should be understood as a multidomain pattern rather than as the absence of a single supportive exchange. Family support includes different functions, including financial assistance, practical caregiving, and emotional interaction, which may contribute to later-life adaptation through distinct pathways (House et al., 1988; Silverstein et al., 2006).

In the present study, the overall FSDI was significantly associated with lower life satisfaction, whereas no individual support domain showed an independently significant association when modeled simultaneously. This pattern suggests that the breadth of unrealized support across multiple domains may provide additional information beyond any single support indicator. Previous research has similarly emphasized that older adults' well-being is shaped by multiple intergenerational resources rather than one isolated form of assistance (Zhan et al., 2025; Jahangir et al., 2025).

This interpretation is consistent with the Conservation of Resources (COR) perspective, which proposes that individuals' well-being depends partly on access to valued resources and that resource restrictions may increase vulnerability to stress (Hobfoll, 1989). Financial support may contribute to economic security, caregiving may reduce functional burdens, and emotional interaction may maintain social connectedness. When several forms of family-based support are not observed, older adults may have a narrower range of available relational resources.

However, the findings should not be interpreted as definitive evidence of a cumulative resource-loss mechanism. A significant overall index combined with nonsignificant component coefficients does not demonstrate additive, interactive, or synergistic effects among support

domains. Instead, the results indicate that a broader pattern of absent support behaviors may be associated with life satisfaction, while the relative importance of individual domains requires further investigation.

This distinction is particularly important because the absence of observed support does not necessarily indicate inadequate support. For example, no caregiving may reflect either unavailable assistance or the absence of current care needs, and limited emotional interaction frequency may not fully represent relationship quality. Future studies incorporating functional limitations, subjective needs, support satisfaction, and support quality may provide a more complete understanding of how different support domains interact.

### 5.3 Formal Welfare Coverage and the Relationship Between Institutional and Family Resources

Family support represents an important resource in later life, but it is increasingly embedded within broader systems of formal welfare provision. Previous research has debated whether formal welfare systems substitute for, complement, or redistribute the functions traditionally provided by families (Agree & Glaser, 2009; Ko & Möhring, 2021).

In this study, formal welfare coverage did not significantly moderate the association between FSDI and life satisfaction. Although conditional estimates became less negative at higher levels of welfare coverage, the interaction effect was not statistically significant. Therefore, the findings do not provide evidence that formal welfare coverage, as captured by combined pension and health-insurance participation, systematically buffers the relationship between absent family support behaviors and life satisfaction.

This result does not imply that formal welfare resources are unimportant. Rather, it suggests that the forms of support captured by formal welfare coverage may not fully overlap with the functions provided through family relationships. Pensions and health insurance primarily provide economic protection and risk sharing, whereas family relationships may provide routine assistance, companionship, and emotional connection. These resources may operate through different pathways and may not be directly interchangeable.

Recent research in China similarly suggests that formal services and informal networks interact in complex ways. Home- and community-based services may depend partly on existing informal support networks, while care needs may be met through different combinations of spouses, children, and community resources (Dong et al., 2025; Xu et al., 2026). Thus, welfare coverage alone may not capture whether older adults have access to functionally appropriate support.

Future research should move beyond coverage indicators and examine benefit adequacy, service accessibility, long-term care availability, and the specific functions that formal programs may compensate for or complement.

### 5.4 Implications for Understanding Healthy Ageing in Changing Family Contexts

The findings have implications for research and policy on healthy ageing in societies experiencing demographic and family transitions. Declining fertility, migration, smaller households, and changing intergenerational arrangements have altered how older adults access family-based resources (Tian & Xu, 2020; Huang & Chang, 2020). In this context, the presence of family members alone may provide an incomplete picture of older adults' support environments.

The concept of family support deficit provides an additional perspective by identifying situations in which family relationships exist but observable support behaviors are limited. This approach complements existing research that focuses on family structure, living arrangements, or formal welfare coverage by emphasizing the realization of support within existing relationships.

From a policy perspective, the findings suggest that assessments of older adults' support environments should consider actual support behaviors alongside family structure. However, FSD should not be used as a direct indicator of unmet need because the measure does not capture subjective expectations, support satisfaction, or alternative sources of assistance. Instead, it may serve as one indicator of potential limitations in family-based support resources that should be considered together with health status, financial conditions, functional limitations, and community resources.

More broadly, the study highlights that healthy ageing depends on the interaction between personal resources, family relationships, and institutional environments. Understanding how these resources combine in different social contexts remains an important direction for future research.

## 6. Conclusions and Implications

This study shows that family ties alone do not necessarily translate into realized support among older adults. Using four waves of the China Family Panel Studies and individual fixed-effects models, we found that increases in family support deficits were associated with small declines in life satisfaction within individuals.

By introducing the concept of family support deficit (FSD), this study extends research on ageing and intergenerational relationships by distinguishing family availability from realized support behaviors. The findings suggest that later-life well-being may be shaped not only by the availability of family ties but also by the extent to which support is realized within those relationships.

These findings highlight the importance of assessing older adults' support environments beyond family structure alone. They also caution against assuming that formal welfare coverage necessarily offsets the well-being implications associated with limited realization of family support. Future research should examine whether the adequacy, accessibility, and specific

functions of formal welfare resources interact differently with distinct forms of intergenerational support.

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