



Predictive Effect of Neighborhood Disadvantage on Depressive Symptoms Among Chinese Middle-Aged and Older Adults: Social Support and Children's Marital Status as Intervening Factors

Taixiang Duan¹ · Daniel T. L. Shek²

Received: 14 February 2026 / Accepted: 27 July 2026
© The Author(s) 2026

Abstract

Depressive symptoms among Chinese middle-aged and older adults have risen substantially in recent years, yet how neighborhood and family factors relate to mental health remains insufficiently understood in China. Using survey data from 1,177 respondents in Chengdu, this study examines associations between neighborhood disadvantage and depressive symptoms, with attention to the mediating role of social support and moderating role of children's marital status. Results indicate that neighborhood disadvantage is associated with higher depression, and instrumental and emotional support appear to mediate this association. Children's marital status moderates the relationship: unmarried sons are linked with amplified negative effects of neighborhood disadvantage on parental mental health, reflecting unique cultural dynamics of filial piety in China. These findings suggest that community-level structural disadvantage intersects with family pressures to shape psychological well-being in aging populations.

Keywords Neighborhood disadvantage · Depressive symptoms · Social support · Children's marital status

✉ Daniel T. L. Shek
daniel.shek@polyu.edu.hk
Taixiang Duan
duantaixiang@163.com

¹ Institute for Social Governance, Law School, Southwest Petroleum University, Chengdu, China

² Department of Applied Social Sciences, Hong Kong Polytechnic University, Hong Kong, China

Introduction

Between 2013 and 2020, the average prevalence of depressive symptoms among urban Chinese residents aged 45 and above increased from 30.27% to 37.79%, which was estimated to affect over 60 million people by 2030 (Li et al., 2025). This trend underscores the urgency of understanding the determinants of depressive symptoms among middle-aged and older adults. Neighborhoods serve as the primary living environment where older adults spend most of their daily lives, however, previous research in China has largely neglected the influence of neighborhood contexts on depressive symptoms in this demographic. In the PsycINFO database, studies examining how neighborhoods influence depressive symptoms within the Chinese context remain particularly scarce. A search using the terms “Chinese,” “depression,” and “neighborhood” yielded only 1 citation for journal articles in PsycINFO on June 14, 2026, and this sole study focused on adolescents rather than middle-aged and older adults.

The ecological systems perspective (Bronfenbrenner, 1979, 1999; Bronfenbrenner & Morris, 2007) provides a theoretical framework for understanding how human development is shaped by multiple nested environmental systems. Research has revealed that disadvantaged neighborhoods contribute to increased depressive symptoms among older adults (Kim, 2010), and family also serves as an important system influencing adults’ mental health. In China, the family functions as a close-knit system: helping one’s child get married is considered the last and most important parental duty (Shek & Ma, 2010). Hence, unmarried children are often regarded as a source of psychological strain (Chen & Tong, 2021), and children’s marital status becomes a critical predictor of elderly quality of life (Greenfield & Marks, 2006; Jin & Guo, 2011). Although studies have emphasized the direct predictive role of disadvantaged neighborhoods or unmarried children in depressive symptoms, scientific studies examining their interactive effects remain limited.

Social support serves as a protective factor that reduces the negative impact of neighborhood disadvantage on psychological distress (Joshi et al., 2017; Mair et al., 2010). However, previous research has not identified which specific types of social support—emotional, informational, or instrumental—play a role, nor has it examined social support’s role under conditions of neighborhood-family interaction. Therefore, this study examines: (1) the interaction effects of neighborhood disadvantage and children’s marital status on depressive symptoms; (2) the mediating role of different types of social support in the relationship between neighborhood disadvantage and depressive symptoms; and (3) the moderated mediation effect of children’s marital status on the relationship between neighborhood disadvantage and depressive symptoms among middle-aged and older adults. In light of the ongoing aging of the Chinese population, this study employed survey data collected in Chengdu, China, to investigate these relationships, thus filling a critical research gap and offering policymakers evidence-based insights for developing culturally responsive elderly care interventions.

Neighborhood Disadvantage and Depressive Symptoms in Middle-Aged and Older Adults

Since the 1980s, China's market-oriented housing reforms have exacerbated neighborhood-level poverty resulting from wealth disparities (Ye et al., 2010). Neighborhood disadvantage caused by poverty includes low income, high unemployment rates, limited educational opportunities, inadequate housing, limited access to medical services, and inadequate social support systems (Kawachi & Berkman, 2001; Sampson et al., 2002; Sampson, 2012). Scholars have described the adverse social effects of concentrated disadvantaged populations as "neighborhood effects" (Sharkey & Faber, 2014; Wilson, 1987), which encompass the impact of residential neighborhoods on individual health (Barnett et al., 2018; Liu et al., 2021).

Wilson (1987) argued that neighborhood disadvantage significantly influences individuals' mental health, which has been explained in terms of conservation or inequitable distribution of resources (Hobfoll, 1989; Holmgreen et al., 2017). For middle-aged and older adults, disadvantaged neighborhoods are often associated with economic hardship, unstable living environments, a lack of security, limited access to medical services, and poor housing conditions (Mouratidis, 2020). Pearlin et al. (2005) argued that structural disadvantages would filter down to chronic stressors at the individual level, progressively compromising mental health. Drawing on current theory and evidence, we proposed the following hypothesis:

Hypothesis 1: Neighborhood disadvantage would be associated with more depressive symptoms in Chinese middle-aged and older adults.

The Mediating Role of Social Support

Although many studies have shown that neighborhood disadvantage positively influences residents' mental health (Kim, 2010; Li, 2023), it remains unclear how the lack of structural resources affects the mental health of older adults, particularly with respect to different types of social support. The social support theories proposed by Cassel (1976) and Cobb (1976) help explain how neighborhood disadvantage penetrates spatial structures and becomes integrated into individual psychology, thus revealing the mechanisms of neighborhood effects. In other words, neighborhood disadvantage affects older people's mental health through social support (Cramm et al., 2013). As older people typically spend most of their time in their neighborhoods (Cramm et al., 2013; Ren et al., 2024), those living in disadvantaged neighborhoods often face difficulties accessing resources related to aging and health. Cohen and Wills (1985) also emphasized that social support acts as "a vitamin" for health, benefiting individuals regardless of their stress level. In advantaged neighborhoods, individuals receive resources through social support, which enhances their emotional, instrumental, and informational support and reduces depression (Hu et al., 2018; Kawachi & Berkman, 2001; Wu et al., 2019). Conversely, disadvantaged neighborhoods offer limited social support, leaving older adults lacking the necessary support to face life's challenges, thus trapping them in a vicious cycle of stress and resource

depletion, which can trigger depression. Disadvantaged neighborhoods can also lead to social stigmatization, damaging older adults' self-esteem and social identity, which exacerbates depressive symptoms (Klijs et al., 2017).

Scholars have identified two types of social support that correspond to two pathways to mental health benefits (Choi & Jun, 2020; Cohen & Wills, 1985; Hakulinen et al., 2016). First, social support is operationalized as "countable" resources such as social network size, number of ties, and frequency of participation in organizations or groups to gauge "how many people or organizations are present" – the vitamin's "dosage unit." Second, social support is operationalized as the core "active ingredient," which includes emotional support (e.g., empathy, encouragement, and enhanced self-worth), informational support (e.g., advice, news, and problem-solving solutions), and instrumental support (e.g., money, labor, goods, or other tangible and intangible assistance).

Besides the mediating effect of social support in the predictive effect of neighborhood disadvantage on adult mental health, the "stress-buffering" model (i.e., moderating effect) explains that social support resources are activated only when individuals are exposed to stress, thereby mitigating the impact of disadvantaged neighborhoods on their health (Cohen & Wills, 1985). Hobfoll's (1989) conservation of resources theory posits that individuals cope with life stress by acquiring, maintaining, and protecting resources. In fact, whether explained by the mediating effect or moderating effect model, the declines in mobility and social networks increase older adults' dependence on neighborhood resources with age, thus amplifying neighborhood effects (Chang et al., 2020; Klijs et al., 2017). As such, we asked whether different dimensions of social support (emotional, instrumental, and informational) mediate the impact of neighborhood disadvantage on older adults' depression (Lin et al., 2024). Based on the aforementioned limitations, we proposed the following hypotheses in this study:

Hypothesis 2: The relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults would be mediated by overall social support.

Hypothesis 2a: The relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults would be mediated by instrumental support.

Hypothesis 2b: The relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults would be mediated by informational support.

Hypothesis 2c: The relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults would be mediated by emotional support.

The Moderating Role of Children's Marital Status

The concept of "life links" emphasizes how changes in close relationships (Elder et al., 2003), such as those with parents, children, and spouses, can affect an individual's mental health. Specifically, adult children's marital status can influence parents' men-

tal health in several ways. First, it constitutes a form of social pressure. In China, unmarried children at the socially expected age are often stigmatized and labeled “leftover men/women” (Ji, 2015; Jin & Guo, 2011). This social stigma creates social stress for both individuals and their parents, who may face criticism from neighbors and extended family networks (Wei et al., 2008). Therefore, parents’ perception of their children’s unmarried status can threaten their sense of parental achievement. Second, deviation from the common social expectations creates stress for the parents. From a cultural perspective, Chinese parents often have strong family expectations, including perpetuating the family lineage. The fear of ending the family line can cause significant distress (Liu, 2006). Third, there are practical concerns involved in families with aging parents and unmarried adult children. Confucian cultural norms emphasize filial piety, expecting married children (especially sons) to take care of their aging parents. Therefore, unmarried adult children may create financial and emotional insecurity for aging parents (Silverstein et al., 2002, 2006; Tao et al., 2021). As unmarried adult children also consume family resources, they are commonly labeled as “ken lao zu” (consumption of elderly tribe) in China, a concept distinct from Western culture.

Although no scientific study has directly demonstrated that children’s marital status moderates the relationship between neighborhood disadvantage and psychological distress in middle-aged and older adults, studies have revealed that older people are embedded in family and neighborhood systems and situated at their “intersection” (Roy, 2018), where they may experience independent or cumulative oppression and disadvantage, within or between these systems. Research has shown that neighborhood effects can vary with family characteristics and circumstances (Sharkey & Faber, 2014). For example, for families in disadvantaged neighborhoods due to economic stress, the costs of children and marriage (e.g., dowries), and resource scarcity (e.g., post-marriage housing, wedding ceremonies), may experience involuntary single family status (Tan, 2023; Wei et al., 2008).

Additionally, research has rarely examined how children’s marital status can prompt older adults to adjust the composition of their social support networks, thereby influencing their mental health. When support from children is limited or intergenerational relationship conflicts arise due to their marital status, Gumede and Xaba (2025) suggested that family members may seek other sources of social support, such as other family members (siblings), friends, neighbors, or neighborhood services. They may obtain emotional, instrumental, or informational support to compensate for their children’s insufficient support (Chang et al., 2020; Lei, 2013). Moreover, the ability to seek and use alternative support may be influenced by the level of neighborhood disadvantage. Researchers explained the negative impact of unmarried children on their parents’ mental health using the stress process model in “connected lives” in the Chinese context (Chen & Tong, 2021; Dong et al., 2025). They found that unmarried sons beyond the expected age significantly harm their parents’ mental health, unlike daughters. They also revealed that children’s marital status affects parents’ psychological distress through intergenerational conflicts, rather than through a reduction in economic support from unmarried sons. To deeply understand the relationship between residential disadvantage and depression in middle-aged and elderly adults, our study proposed that compared with parents whose children are married, middle-aged and older adults with a single child, be it a son or a daughter,

exhibit significantly higher depressive symptoms. Therefore, this study underscored the pervasive and gender-blind weight of unfinished intergenerational duty in China's family culture. We proposed the following hypotheses in this study:

Hypothesis 3: Adult children's marital status would be related to depressive symptoms in middle-aged and older adults

Hypothesis 4: Adult children's marital status would moderate the relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults

Method

Data and Variables

We obtained data from a project titled "Research on Neighborhood Effects of Residential Spatial Differentiation and Its Governance in Megacities" in the Chinese mainland (i.e., secondary data analysis). In July 2022 and February/March 2023, probability proportional to size sampling was used to randomly select 16 streets and 32 communities in Chengdu, accounting for the city's administrative divisions, economic development, and population distribution characteristics. Within each community, 50 households were randomly chosen to participate in a questionnaire survey, completed by family members familiar with their household's economic situation. The procedures of the study and the process of voluntary participation were explained to potential participants both verbally and through a printed informed consent form. All respondents gave their written informed consent before completing the survey.

Of the 1,600 questionnaires distributed, 1,540 were completed (a 96.25% response rate). The demographic characteristics of the respondents, including education level, average years of schooling, and urban/rural population, closely resembled those obtained in the seventh Chengdu population census. Consequently, the survey data were considered representative and of high quality.

As we focused on the relationship between neighborhood disadvantage, children's marital status, and psychological well-being in older adults, the analysis was restricted to respondents aged 45 to 90. Additionally, after excluding five respondents without children, the final sample included 1,177 respondents.

Measures

Depression The key dependent variable was depressive symptoms using the short version of the Center for Epidemiologic Studies Depression Scale developed by Radloff (1977), which contains eight items (e.g., "I felt depressed;" "I felt that everything I did was an effort"). The respondents rated the frequency of these symptoms over the past week on a 4-point scale, ranging from 1 (*rarely or none of the time, less than 1 day*) to 4 (*most or all of the time, 5–7 days*). Items 4 and 6 were reverse-scored, and total scores ranged from 8 to 32, with higher scores indicating more severe depressive symptoms.

In the current study, the Cronbach's alpha for the depression scale was 0.816, indicating good internal consistency. Previous studies have shown that the Chinese C-ESD possesses good psychometric properties (Chen & Mui, 2014; Chen et al., 2024).

Neighborhood Disadvantage Following previous studies (Harding, 2009), we constructed a neighborhood disadvantage index based on five indicators: the proportion of residents with a college degree or higher, urban household registration, nonmanual workers, residential stability, and high-income households. This index ranged from 0 to 1, with higher values indicating better neighborhood socioeconomic contexts. We then divided this index into tertiles: neighborhoods with values between 0.66 and 1 were coded as 1 (least disadvantaged, reference category), those between 0.33 and 0.66 were coded as 2 (medium disadvantaged), and those between 0 and 0.33 were coded as 3 (most disadvantaged). We created tertiles partly to align with previous research (Wodtke et al., 2011) and because research has suggested that neighborhood effects follow a nonlinear trajectory (Alvarado, 2016).

Social Support Social support was measured using the Social Support Scale from the Chinese ISSP Social Network and Social Resources module. The scale comprises five items capturing three support dimensions: instrumental support (items a and b), informational support (item d), and emotional support (items c and e) (Table S1). Following Joye et al. (2019), rather than dichotomizing responses into a simple “presence or absence of support,” we employed nonlinear principal component analysis (NLPCA) to extract the dimensional structure of social support, thereby preserving information on the intensity and relative importance of different support sources. Results showed that the five items load clearly onto three dimensions, accounting for 63.56% of the total explained variance. NLPCA is also able to achieve the best possible scaling of response categories, assigning the same rescaled value to respondents who selected the same option (e.g., “close family member”). However, since the rescaled values include negative numbers and are not readily interpretable, we transformed them into a 0–10 scale, with higher values indicating greater social support (Joyce et al., 2019).

Children's Marital Status Based on the demographic characteristics of the respondents' children, we categorized children's marital status into three types: married children, unmarried sons, and unmarried daughters. We distinguished between unmarried sons and daughters because sons' marriage is considered a continuation of the family lineage, and their marital status can have different psychological impacts on their parents (Chen & Tong, 2021).

Demographic Characteristics We collected information on gender, age, marital status, years of schooling, household registration status, citizenship, total family size, and family SES in regression analyses. Gender was coded as 0 = female and 1 = male; marital status was coded as 0 = divorced/widowed and 1 = married; household registration status was coded as 0 = rural and 1 = urban; citizenship was coded as 0 = citizen and 1 = migrants; and family SES was measured by respondents' self-reported social class, with values ranging from 1 to 5, where higher values indicate higher family SES. We summarized the descriptive statistics for all variables in Table 1. Nota-

Table 1 Descriptive statistics of the main variables

	Full sample (N = 1177)		Son (N = 840)		Daughter (N = 710)	
	Mean/Freq	SD/Percent	Mean/Freq	SD/Percent	Mean/Freq	SD/Percent
Depressive symptoms	12.33	3.514	12.28	3.479	12.17	3.621
Neighborhood disadvantage						
Least disadvantaged	86	7.31%	56	6.67%	55	7.75%
Medium disadvantaged	611	51.91%	425	50.60%	369	51.97%
Most disadvantaged	480	40.78%	359	42.74%	286	40.28%
Social support						
Instrumental support	4.970	1.098	4.943	1.154	4.999	1.140
Informational support	1.569	0.922	1.492	0.741	1.562	0.876
Emotional support	6.020	1.125	6.067	1.171	6.059	1.119
Children's marital status						
Married children	856	72.73%	646	76.90%	583	82.11%
Unmarried son	194	16.48%	194	23.10%		
Unmarried daughter	127	10.79%			127	17.89%
Gender						
Female	681	57.86%	461	54.88%	462	65.07%
Male	496	42.14%	379	45.12%	248	34.93%
Age	57.38	6.433	57.76	6.391	57.45	6.389
Marital status						
Divorced/Widowed	172	14.61%	132	15.71%	107	15.07%
Married	1005	85.39%	708	84.29%	603	84.93%
Years of schooling	9.111	3.496	9.033	3.467	9.243	3.405%
Household registration						
Rural	294	24.98%	213	25.36%	171	24.08%
Urban	883	75.02%	627	74.64%	539	75.92%
Citizenship						
Citizens	978	83.09%	702	83.57%	587	82.68%
Migrants	199	16.91%	138	16.43%	123	17.32%
Family size	3.562	1.554	3.345	1.611	3.045	1.446
Family SES	2.383	0.808	2.390	0.828	2.344	0.810

bly, respondents with unmarried sons reported slightly higher depressive symptoms compared to those with married children, suggesting a potential association between children's marital status and parental mental health.

Models to be Tested

The data were analyzed using Stata 18. First, we used ordinary least squares regression to estimate the impact of neighborhood disadvantage on depressive symptoms among middle-aged and older adults. Using stepwise regression, we sequentially examined the mediating effects of social support across three dimensions (i.e., instrumental, informational, and emotional support) on the relationship between neighborhood disadvantage and depressive symptoms.

Subsequently, we analyzed the moderating role of children's marital status in this relationship. To better illustrate these interaction effects, we conducted subgroup analyses based on children's gender to highlight heterogeneous results across different groups. Finally, we explored the moderated mediation effects of children's marital status, examining whether it moderates the indirect relationship between neighborhood disadvantage and depressive symptoms through social support. Additionally, given that neighborhood effects may vary in different neighborhoods and that depressive symptoms among senior citizens within the same neighborhood may be correlated, we clustered standard errors at the neighborhood level in our regression models. Finally, we used structural equation modeling (SEM) to examine the pathways from neighborhood disadvantage attributes to depressive symptoms to triangulate the findings.

Results

The Impact of Neighborhood Disadvantage on Depressive Symptoms

Table 2 presents multiple regression results of the impact of neighborhood disadvantage on depressive symptoms in middle-aged and older adults. Model 1 showed that neighborhood disadvantage was positively associated with depressive symptoms in middle-aged and older adults.

Models 2–4 showed that instrumental and emotional support were significantly negatively associated with depressive symptoms, while informational support was only marginally significant ($p < 0.10$). When instrumental, informational, and emotional support were entered separately in Models 5, 6, and 7, the coefficient of neighborhood disadvantage on depressive symptoms decreased in each case. Model 8, which included all three support types, further attenuated the coefficient to 0.760. These stepwise results suggest that instrumental, informational, and emotional support may mediate the relationship between neighborhood disadvantage and depressive symptoms.

To formally test these mediating effects, we conducted the KHB mediation analysis. The results (Table S2) showed that all three types of social support had significant indirect effects in the association between neighborhood disadvantage (most disadvantaged group) and depressive symptoms. The indirect effects of instrumental support (indirect effect=0.104, 95% CI [0.065, 0.236]), informational support (indirect effect=0.143,

Table 2 The impact of neighborhood disadvantage on depressive symptoms in middle-aged and older adults

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Neighborhood disadvantage (0 = Least disadvantaged)								
Medium disadvantaged	0.590** (0.188)				0.560** (0.180)	0.531** (0.189)	0.561** (0.193)	0.531** (0.183)
Most disadvantaged	0.934*** (0.246)				0.830** (0.239)	0.791** (0.237)	0.809** (0.261)	0.760** (0.242)
Instrumental support		-0.184* (0.086)			-0.182* (0.086)			-0.201* (0.083)
Informational support			0.329+ (0.165)			0.320+ (0.165)		0.332+ (0.168)
Emotional support				-0.248** (0.083)			-0.244** (0.083)	-0.251** (0.083)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	14.118*** (1.510)	16.121*** (1.480)	14.581*** (1.494)	16.526*** (1.530)	15.062*** (1.575)	13.592*** (1.597)	15.479*** (1.620)	16.017*** (1.851)
N	1177	1177	1177	1177	1177	1177	1177	1177
adj. R ²	0.078	0.079	0.081	0.082	0.080	0.082	0.083	0.091

(1) Clustered standard errors in parentheses

(2) Standard errors are adjusted for 32 clusters in neighborhoods

(3) Significance levels: + < 0.10, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

95% CI [0.025, 0.110]), and emotional support (indirect effect=0.125, 95% CI [0.064, 0.113]) were all statistically significant, as their 95% bootstrap confidence intervals did not include zero. These findings suggest that instrumental, informational, and emotional support may serve as pathways through which neighborhood disadvantage is associated with depressive symptoms among middle-aged and older adults.

Moderating Effect of Children's Marital Status on the Predictive Relationship Between Neighborhood Disadvantage and Depressive Symptoms

Table 3 presents the moderating effect of children's marital status on the relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults. Model 1 showed that neighborhood disadvantage and children's marital

Table 3 The moderating effect of children's marital status on the relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults

	(1) Full sample	(2) Full sample	(3) Son	(4) Son	(5) Daughter	(6) Daughter
Neighborhood disadvantage (0=Least disadvantaged)						
Medium disadvantaged	0.590* (0.255)	0.131 (0.236)	0.519 (0.307)	0.016 (0.283)	0.704** (0.235)	0.637* (0.243)
Most disadvantaged	0.929** (0.308)	0.623* (0.275)	0.920* (0.337)	0.495 (0.307)	1.135** (0.345)	1.124** (0.348)
Children's Marital Status (0=Married children)						
Unmarried son	2.129*** (0.297)	0.770*** (0.119)	2.160*** (0.329)	0.666*** (0.182)		
Unmarried daughter	1.629*** (0.294)	1.041 (0.773)			1.463*** (0.312)	1.274+ (0.705)
Medium disadvantaged × Unmarried son		1.643*** (0.373)		1.762*** (0.423)		
Medium disadvantaged × Unmarried daughter		0.783 (0.825)				0.327 (0.755)
Most disadvantaged × Unmarried son		1.241* (0.513)		1.414* (0.579)		
Most disadvantaged × Unmarried daughter		0.405 (0.887)				-0.004 (0.815)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	11.633*** (1.515)	11.988*** (1.546)	12.219*** (1.758)	12.695*** (1.788)	12.913*** (1.765)	12.930*** (1.781)
N	1177	1177	840	840	710	710
adj. R ²	0.128	0.127	0.110	0.114	0.092	0.094

(1) Clustered standard errors in parentheses

(2) Standard errors are adjusted for 32 clusters in neighborhoods

(3) Significance levels: + < 0.10, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

status were significantly associated with depressive symptoms. Compared with those with married children, the respondents with unmarried sons had significantly higher depressive symptoms ($B=2.129$, $p < 0.001$), as did those with unmarried daughters ($B=1.629$, $p < 0.001$). This indicates that neighborhood stress and family stress significantly affect depressive symptoms in middle-aged and older adults. Model 2 included the interaction terms between neighborhood disadvantage and children's marital status, revealing that the impact of these variables on depressive symptoms was substantially reduced. The interaction term between medium disadvantaged neighborhoods and unmarried sons was significantly associated with higher depressive symptoms ($B=1.643$, $p < 0.001$), as was that between the most disadvantaged neighborhoods and unmarried sons ($B=1.241$, $p < 0.05$). However, there was no significant interaction effect between neighborhood disadvantage and unmarried daughters.

Model 3 revealed that unmarried sons were significantly positively correlated with depressive symptoms ($B=2.160$, $p < 0.001$). Model 4 showed that the interaction term between neighborhood disadvantage and sons' marital status was statistically significant. The respondents from medium disadvantaged neighborhoods with unmarried sons had significantly higher depressive symptoms ($B=1.762$, $p < 0.001$), as did those from the most disadvantaged neighborhoods ($B=1.414$, $p < 0.05$).

Model 5 indicated that unmarried daughters were also positively correlated with depressive symptoms ($B=1.463$, $p < 0.001$). Model 6 showed that the interaction term between neighborhood disadvantage and daughters' marital status was not statistically significant. These results support the findings of Model 2, indicating that family stress related to having an unmarried son positively moderates the impact of neighborhood disadvantage on depressive symptoms in middle-aged and older adults.

The Moderated Mediation Effect of Children's Marital Status on the Relationship Between Neighborhood Disadvantage and Depressive Symptoms

Table 4 presents the moderated mediation effect of children's marital status on the relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults. Model 1 showed that the interaction term between neighborhood disadvantage and children's marital status was significantly positively correlated with depressive symptoms. Instrumental support remained significantly negatively correlated with depressive symptoms and the coefficient changed from -0.182 ($p < 0.05$) in Model 5 of Table 2 to -0.208 ($p < 0.05$). This suggests a greater mediating effect of instrumental support between neighborhood disadvantage and depressive symptoms.

Model 3 showed that the interaction term between neighborhood disadvantage and children's marital status was significantly positively correlated with depressive symptoms. Emotional support remained significantly negatively correlated with depressive symptoms, although the coefficient changed from -0.244 ($p < 0.01$) in Model 7 of Table 2 to -0.226 ($p < 0.01$). This suggests a weaker mediating effect of emotional support between neighborhood disadvantage and depressive symptoms.

Unlike instrumental support, if middle-aged and older adults with unmarried sons and living in moderately and most disadvantaged neighborhoods receive the same level of emotional support, the effect of reducing depressive symptoms through emotional support would be somewhat diminished.

Model 4 in Table 4 showed that the interaction term between neighborhood disadvantage and children's marital status, as well as instrumental and emotional support, was all significantly associated with depressive symptoms. These findings indicate that instrumental and emotional support play a significant mediating role between neighborhood disadvantage and depressive symptoms; children's marital status moderates the effects of neighborhood disadvantage on depressive symptoms.

Table 4 The moderated mediation effect of children's marital status on the relationship between neighborhood disadvantage and depressive symptoms in middle-aged and older adults

	(1)	(2)	(3)	(4)
Neighborhood disadvantage (0=Least disadvantaged)				
Medium disadvantaged	0.777*** (0.109)	0.781*** (0.131)	0.773*** (0.136)	0.794*** (0.133)
Most disadvantaged	1.242 (0.792)	1.021 (0.747)	1.023 (0.728)	1.220 (0.721)
Children's Marital Status (0=Married children)				
Unmarried son	0.161 (0.239)	0.106 (0.230)	0.127 (0.231)	0.134 (0.222)
Unmarried daughter	0.640* (0.272)	0.580* (0.262)	0.598* (0.283)	0.571* (0.264)
Medium disadvantaged × Unmarried son	1.668*** (0.367)	1.630*** (0.374)	1.638*** (0.372)	1.651*** (0.365)
Medium disadvantaged × Unmarried daughter	0.590 (0.839)	0.710 (0.797)	0.755 (0.784)	0.467 (0.774)
Most disadvantaged × Unmarried son	1.218* (0.507)	1.255* (0.513)	1.236* (0.504)	1.225* (0.494)
Most disadvantaged neighborhood × Unmarried daughter	0.268 (0.898)	0.435 (0.860)	0.436 (0.855)	0.320 (0.834)
Instrumental support	-0.208* (0.089)			-0.227** (0.079)
Informational support		0.305+ (0.178)		0.319+ (0.164)
Emotional support			-0.226** (0.084)	-0.225** (0.083)
Control variables	Yes	Yes	Yes	Yes
Constant	13.023*** (1.591)	11.502*** (1.629)	13.315*** (1.672)	13.982*** (1.860)
N	1177	1177	1177	1177
adj. R ²	0.131	0.131	0.132	0.141

(1) Clustered standard errors in parentheses

(2) Standard errors are adjusted for 32 clusters in neighborhoods

(3) Significance levels: + < 0.10, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Analyses based on Structural Equation Modeling

To reinforce the findings based on the multiple regression analyses, SEM was used to understand the impact of neighborhood disadvantage on depressive symptoms in older adults, as well as the mediating role of social support and the moderating role of children's marital status in one single model. As shown in Fig. 1, the model demonstrated good fit to the data: RMSEA=0.016 (below the recommended threshold of 0.08), CFI=0.969 (exceeding the recommended cutoff of 0.9), and SRMR=0.011 (below the recommended threshold of 0.05).

The SEM results indicated that neighborhood disadvantage positively predicted depressive symptoms among older adults through both direct and indirect pathways. Compared with advantaged neighborhoods, older adults living in middle-level and disadvantaged neighborhoods exhibited relatively higher levels of depressive symp-

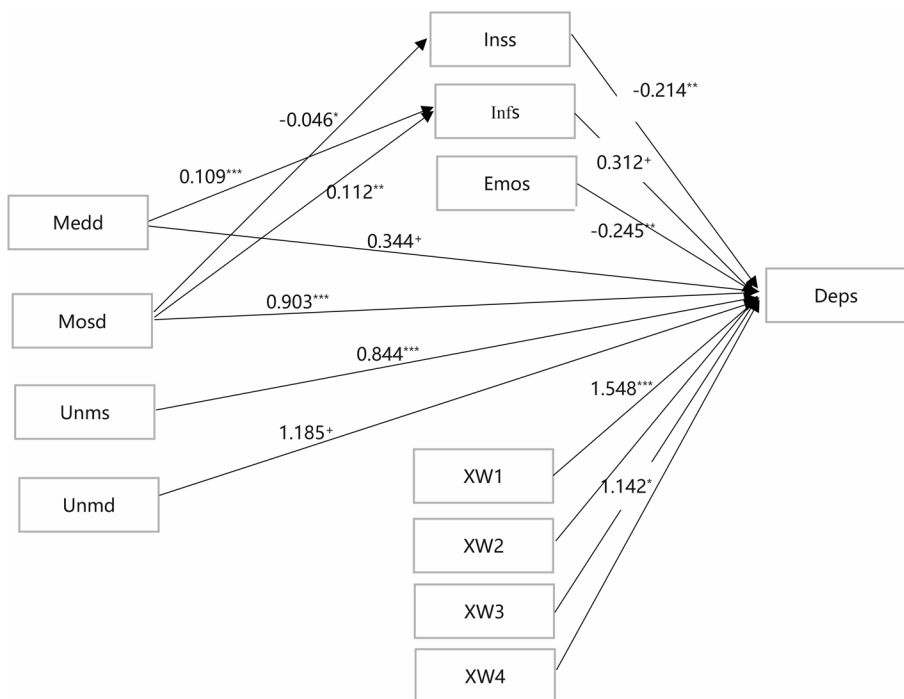


Fig. 1 Structural equation model analysis results. Notes: Deps: Depressive symptoms; Inss: Instrumental support; InfS: Informational support; Emos: Emotional support; Medd: Medium disadvantaged; Mosd: Most disadvantaged; Unms: Unmarried son; Unmd: Unmarried daughter; XW1: Medium disadvantaged × Unmarried son, XW2: Medium disadvantaged × Unmarried daughter, XW3: Most disadvantaged × Unmarried son, XW4: Most disadvantaged neighborhood × Unmarried daughter. Values are coefficients. Only paths with significant coefficients are shown. To reduce clutter, the paths from the control variables are not shown, but they were included in the analysis. Control variables are gender, age, marital status, years of schooling, household registration status, and citizenship, total family size and family SES. Model fit indices: RMSEA=0.016, CFI=0.969, SRMR=0.011. Significance levels: + < 0.10, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

toms. Furthermore, neighborhood disadvantage influenced depressive symptoms by affecting the instrumental and informational support received by middle-aged and older adults. Specifically, compared with advantaged neighborhoods, the instrumental support received by older adults in disadvantaged neighborhoods was significantly lower. This lack of instrumental support made it difficult to buffer the negative impact of depressive symptoms. However, the significantly greater informational support received by middle-aged and older adults in middle-level and disadvantaged neighborhoods did not mitigate depressive symptoms. On the contrary, it made them worse.

The SEM results also indicated that neighborhood disadvantage predicted depressive symptoms in older adults by interacting with adult children's marital status. Compared with older adults with married children, those with unmarried sons reported significantly higher depressive symptoms, and having unmarried daughters also affected depressive symptoms to some extent. Meanwhile, the interaction effects showed that the impact of middle-level and disadvantaged neighborhoods on depressive symptoms was further amplified by having an unmarried son (see Fig. 1).

Discussion

Using representative survey data from Chengdu, China, we examined the association between residential disadvantage and mental health in middle-aged and older adults. Our findings provide support for the conjecture that neighborhood disadvantage is closely linked to higher risk of mental health problems within this population (Kim, 2010; Lund et al., 2018). We further examined the potential mechanisms through which adverse neighborhood conditions influence psychological well-being among middle-aged and older adults. Our findings support the hypothesized mediating role of social support, particularly instrumental support, in the association between neighborhood disadvantage and depressive symptoms. Additionally, we observed significant associations between neighborhood disadvantage and depressive symptoms, as well as between children's marital status and depressive symptoms. Notably, children's marital status moderated the relationship between neighborhood disadvantage and depressive symptoms. This pioneering observation supports the cultural influence of neighborhood effects and intergenerational ties on depressive disorder among middle-aged and older adults, which is a unique finding compared with Western findings (Lund et al., 2018; Fingerman et al., 2024).

Several significant observations can be highlighted from the present study. First, the results provide support for the hypothesis of "neighborhood effects" (Van Ham et al., 2012) and for the social determinants of health inequalities. Neighborhood disadvantage harms individual mental health (Joshi et al., 2017; Kim, 2010). In contrast to the neighborhood disadvantages described in Western literature, which are attributed to the cumulative effects of long-term poverty driven by market forces and racial segregation, Chengdu's neighborhood disadvantages are primarily attributable to short-term institutional drivers. Land system reforms—including the Centralized Resettlement Policies and the Rural Residential Land Withdrawal Policy—abruptly transitioned farmers, who had historically depended on agriculture, into urban residency. This shift engendered a profound transformation in both their hukou

(household registration) status and their community living environment. In terms of livelihoods, this transition proved particularly challenging for middle-aged and older adults, whose extensive rural backgrounds left them lacking the cultural competencies and practical skills necessary for urban life. As for residential aspects, these groups coalesced into “resettlement compounds” and “urban villages”—residential enclaves commonly characterized by substandard infrastructure, a lack of age-inclusive facilities, and limited access to public services. This dual predicament—institutional exclusion and spatial disadvantage—leads to prolonged exposure to a stressful ecological environment. This study examined the significant issue of neighborhood disadvantage and its impact on psychological health in Chengdu, a large Chinese inland city, thereby complementing the existing literature and offering insights into the effects of neighborhood disadvantage on the psychological well-being of middle-aged and older adults within the Chinese cultural context.

Second, the mediation analysis supports the role of social support as a mechanism linking neighborhood disadvantage to depressive symptoms among middle-aged and older adults. Notably, this mediating pathway was only observed at higher levels of neighborhood disadvantage, suggesting that the buffering function of social support becomes more salient as contextual adversity intensifies. These findings underscore the importance of considering the level of neighborhood disadvantage when evaluating the protective role of social support in later life.

Moreover, this work provided evidence that residents in moderately and highly disadvantaged neighborhoods reported greater exposure to informational support; however, those in the most disadvantaged areas received significantly less instrumental support. This suggests that while instrumental support may reduce depressive symptoms in the Chinese context (Lu et al., 2020), its protective effect is substantially attenuated in disadvantaged neighborhoods due to its limited availability. That is, if senior citizens living in moderately and most disadvantaged neighborhoods have equal access to instrumental support, the effect of reducing depressive symptoms through instrumental support will be greater. This echoes the findings of previous studies, which have shown that the mental health of parents was positively impacted by instrumental support in medium disadvantaged and most disadvantaged neighborhoods (Cong & Silverstein, 2008).

Consistent with findings from Western scholarship, the mental health effects of informational support among older adults are moderated not only by the quality and credibility of the information received but also by its successful integration into accessible, contextually appropriate caregiving resources (Small, 2009). This study reveals that older adults residing in moderately and socioeconomically disadvantaged neighborhoods—despite reporting higher exposure to informational support—exhibit significantly elevated depressive symptoms. These results underscore a pronounced neighborhood context-dependency in the efficacy of informational support: its psychological impact is shaped by the synergistic influence of local cultural norms, the density and trust embedded in social networks, and the spatially grounded practices governing information access and interpretation within specific community settings.

In disadvantaged neighborhoods, middle-aged and older adults face systemic barriers—including low digital literacy, limited institutional trust, and fragmented

service infrastructures—that impede equitable access to authoritative policy information in health care, social welfare, and long-term care. Consequently, information asymmetry persists, increasing susceptibility to misinterpretation. Meanwhile, the elderly living in such communities are associated with a higher propensity to reject various digital information channels, including government apps, WeChat groups, and so on. Therefore, information that is not necessarily correct by word of mouth is more likely to be disseminated, which can easily cause group anxiety among middle-aged and older adults. However, older adults in advantaged communities benefit from a robust infrastructure of age-friendly facilities—including universal-design access rooms, community dining halls, day care centers, public parks, and professional social service organizations—that collectively enable the effective implementation of information-supported elder care. This infrastructure helps resolve the “information abundant but action limited” paradox by bridging informational inputs with tangible, on-the-ground support. Moreover, thoughtfully designed public spaces—such as community gardens and pedestrian-friendly networks—in high-quality neighborhoods serve not only functional purposes but also act as contextual anchors that foster interpersonal trust and social cohesion among older adults, thereby extending the reach and psychological utility of informational support beyond basic service coordination to broader mental health promotion.

Third, this study supported the hypothesis that residents living in medium disadvantaged neighborhoods—and who have unmarried sons—exhibit significantly higher levels of depressive symptoms compared with residents from the least disadvantaged neighborhoods. That supports the notion that in the Chinese social context, children’s marriage is viewed by older adults as an “unfinished task” in their life course. Therefore, children’s marital problems, especially having an unmarried son, exacerbate the distress of elderly groups. These findings are largely consistent with the results of the multiple regression analysis. In the most disadvantaged neighborhoods, those with unmarried sons exhibit significantly higher depressive symptoms.

Neighborhood disadvantages profoundly reshape individual life opportunities through intergenerational transmission at the family level. As Western research reveals, children who grow up in disadvantaged communities need to confront the disadvantaged living environment of their parents and the lack of opportunities for self-development (Gilligan et al., 2018; Mare, 2011). In China, social stratification, marketization, and the interweaving of marriage institutions have raised the marriage threshold for men in disadvantaged communities (Yu & Xie, 2019). According to China’s patrilocal family system, parents need to pay a high bride price and housing expenses in exchange for their son’s marital competitiveness (Feldman et al., 2007; Nie & Wang, 2007). Meanwhile, the marriage squeeze further raises the age of first marriage for men in disadvantaged communities. When parents in disadvantaged communities cannot help their sons get married, it means that parents still have an unfulfilled life mission and will suffer psychologically.

Additionally, our research also found that parents in disadvantaged communities do not become psychologically depressed because their daughters are unmarried, which seems to confirm the deep social and psychological continuation of the Patrilocal Residence System, parents do not have the obligation to raise funds for their daughters’ marriages, and daughters rarely face the dilemma of “marriage squeeze.”

As the popular proverb reminds us, “daughters are spilled water,” destined to flow outward at the time of marriage and relinquish their rights on the natal home, suggesting that parents structurally undervalue daughters’ old-age support, as gendered norms regard caregiving as a male duty and render daughters’ contributions optional or unseen. In the patrilineal calculation of cultural obligations, a daughter’s continued singlehood is interpreted as a suspended rather than a failed life course transition. Consequently, a daughter’s singlehood remains a non-salient life course event, imposing no psychological burden on the older generation.

Can this psychological distress be alleviated at the neighborhood level? This is where our study differs from previous research, as we not only link neighborhood disadvantage to children’s marital status based on the life course principle but also extend the operationalization of social support from child support (e.g., economic and emotional support, caregiving, quality of intergenerational relationship) to a broader range of social support, including support from family, friends, and the community.

In China, the safety net prioritizes the family, with relatives forming the inner circle and neighbors serving as a reserve. When an adult child remains single beyond the expected age, the inner circle often shrinks, and parents may avoid informal conversations out of embarrassment. Culture disrupts the support pathway: what should be a shelter turns into a public stage, and the message changes depending on who is listening. People in advantaged neighborhoods practice polite distancing, with marital status going almost unnoticed. In disadvantaged neighborhoods, news travels fast, making a child’s single status a prime subject of gossip. Therefore, the neighborhood context does not change the amount of help offered; it changes the level of shame. The more “off-script” the child’s love life is, and the closer the neighborhood ties, the more parents feel judged, and the faster their descent into depression. Therefore, in China, a child’s marriage is more than a family matter; it is a public symbol of the parents’ social status and their success in raising their child. When a son in particular remains single, the household is labeled “failed parenting” or “incomplete,” triggering in older adults an immediate mixture of shame, self-blame, and fear of social judgment. This emotional reaction does not require any mediating social support; it directly fuels depressive symptoms, amplified under the gaze of neighbors. It is worth noting that, in China, different types of communities have different attitudes toward children’s marital status and how they deal with this information. Parents from advantaged neighborhoods have a more open attitude toward their children’s marriage. Therefore, their children’s marital status does not cause them psychological distress. Even if they do experience psychological distress, they have better resources to cope with it in old age, such as fewer stressful events, a better living environment, and more diverse social support, which reduces its negative effect.

Our study has theoretical and practical implications. Theoretically, it links intergenerational ties throughout the life course to neighborhood effects, elucidating the relationships between neighborhood disadvantage, children’s marital issues, and parental mental health, and addressing how structural disadvantages at the neighborhood level are transmitted to the individual level. Although neighborhood disadvantage and intergenerational ties are often studied separately, our research examines them together, identifies differences in the mediating role of social support, and considers gender expectations regarding children’s marriage in the Chinese cultural con-

text. This provides a more nuanced and contextually rich understanding of the life course of elderly groups in China, at the neighborhood, family, and individual levels. Additionally, we elucidate how adverse neighborhood- and family-related factors interact synergistically to exert cumulative pressures on middle-aged and older parents. Our proposed moderated mediation model provides an integrative theoretical framework for examining both the direct and indirect associations between neighborhood disadvantage and elderly groups' psychological well-being—a contribution that advances current scientific understanding.

Practically, our study has important implications for policymakers and service providers. First, to address the challenges posed by China's aging population in terms of elderly care, local governments and organizations should collaborate to provide affordable housing, improve the physical environment of neighborhoods, and renovate poorly designed facilities, thereby reducing social spatial imbalances between neighborhoods and normalizing neighborhood segregation in China by providing more public resources and facilities to the most disadvantaged neighborhoods (Wan & Su, 2016). Second, to address the intergenerational accumulation of neighborhood poverty, particularly in relation to children's marital status, the number of public marriage service institutions could be increased in low-income neighborhoods. Measures could also be taken to alleviate housing and marriage pressures on young people in these neighborhoods, with a focus on unmarried men. Third, given the significant weakening of family care functions compounded by neighborhood poverty, especially under China's "4-2-1" family structure (four grandparents, two parents, and one child) resulting from the one-child policy implemented in the 1980s, which increased the care burden on the middle generation (Fu et al., 2025; Zhang & Goza, 2006), it is crucial to promote dual-purpose elderly care policies in disadvantaged neighborhoods to strengthen the link between family and neighborhood. This would involve positioning the "family" as the primary caregiving unit and the "neighborhood" as a resource hub, thereby creating a continuous care circuit that keeps people close to their homes and families, transforming loose neighborhood ties into a robust mutual assistance network, and achieving functional complementarity and emotional reciprocity between family and neighborhood in elderly care.

Despite its innovative and pioneering nature, our study has several limitations. First, although our stratified sampling method ensured good representativeness of Chengdu, cultural differences may exist between Chengdu and northern or coastal cities, which necessitates caution when generalizing our findings on depressive symptoms in Chinese middle-aged and older adults. Second, our use of cross-sectional data collected at a single time point precludes any causal inference, despite our rigorous mediation and moderated mediation analyses. Furthermore, although we controlled for demographic and socioeconomic variables, unobserved confounders (e.g., prior residential history) may influence the observed associations. Finally, the mechanisms through which neighborhood disadvantage affects psychological well-being in middle-aged and older adults may be more complex. Our study examined the mediating role of social support and the moderating effect of children's marital status but ignored other potential mechanisms. Future research should explore these mechanisms in a multidimensional way to reveal the complex impact of neighborhood disadvantage on depressive symptoms within this population.

Conclusions

Our study revealed how neighborhood disadvantage is associated with individual mental health through social support, a pattern consistent with evidence from Western settings. In the Chinese cultural context, characterized by strong filial piety and intergenerational solidarity, neighborhood disadvantage is closely linked to intergenerational family relationships. Specifically, children's marital status moderates the association between neighborhood disadvantage and the mental health of middle-aged and older parents. Furthermore, children's marital status strengthens the association between neighborhood disadvantage and depressive symptoms through instrumental support but mitigates this effect through emotional support.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11482-026-10657-9>.

Acknowledgements The preparation of this paper was supported in part by The Hong Kong Polytechnic University (ZZUE and W02W). This research was supported by Sichuan Province Philosophy and Social Science Planning Project (25SH135; SCJJ25ND106), Chengdu Philosophy and Social Science Planning Project (2024CS106), and Cultivation Project, Southwest Petroleum University (2024RW054).

Author Contributions T.X. Duan acquired the data and conducted the study, analyzed the data, and draft the initial version; D.T.L. Shek revised and refined the paper and analyses. All authors reviewed the manuscript.

Funding Open access funding provided by The Hong Kong Polytechnic University. The preparation of this paper was supported in part by The Hong Kong Polytechnic University (ZZUE and W02W). This research was supported by Sichuan Province Philosophy and Social Science Planning Project (25SH135; SCJJ25ND106), Chengdu Philosophy and Social Science Planning Project (2024CS106), and Cultivation Project, Southwest Petroleum University (2024RW054).

Data Availability We obtained data from a project titled “Research on Neighborhood Effects of Residential Spatial Differentiation and Its Governance in Megacities,” which was supported by the National Social Science Fund of China.

Declarations

Ethics Approval and Informed Consent The study was based on an existing open access data set with anonymous participant identity. Informed consent was obtained in the original study in accordance with Declaration of Helsinki.

Competing interests As the corresponding author is a Chief Editor of ARQOL, an Associate Editor has been invited to take care of the editorial process and make an independent editorial decision.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Alvarado, S. E. (2016). Delayed disadvantage: Neighborhood context and child development. *Social Forces*, 94(4), 1847–1877. <https://doi.org/10.1093/sf/sow020>
- Barnett, A., Zhang, C. J. P., Johnston, J. M., & Cerin, E. (2018). Relationships between the neighborhood environment and depression in older adults: A systematic review and meta-analysis. *International Psychogeriatrics*, 30(8), 1153–1176. <https://doi.org/10.1017/S104161021700271X>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.
- Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 3–28). American Psychological Association. <https://doi.org/10.1037/10317-001>
- Bronfenbrenner, U., & Morris, P. A. (2007). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of child psychology* (pp. 793–828). Wiley. <https://doi.org/10.1002/9780470147658.chpsy0114>
- Cassel, J. (1976). The contribution of the social environment to host resistance: The fourth Wade Hampton Frost lecture. *American Journal of Epidemiology*, 104(2), 107–123. <https://doi.org/10.1093/oxfordjournals.aje.a112281>
- Chang, Q., Peng, C., Guo, Y., Cai, Z., & Yip, P. S. F. (2020). Mechanisms connecting objective and subjective poverty to mental health: Serial mediation roles of negative life events and social support. *Social Science & Medicine*, 265, 113308. <https://doi.org/10.1016/j.socscimed.2020.113308>
- Chen, D., & Tong, Y. (2021). Marriage for the sake of parents? Adult children's marriage formation and parental psychological distress in China. *Journal of Marriage and Family*, 83(4), 1194–1211. <https://doi.org/10.1111/jomf.12749>
- Chen, H. J., & Mui, A. C. (2014). Factorial validity of the Center for Epidemiologic Studies Depression Scale short form in older population in China. *International Psychogeriatrics*, 26(1), 49–57. <https://doi.org/10.1017/S1041610213001701>
- Chen, J., Sun, J., Lv, Y., Hu, S., Cheng, W., Zhao, X., Zheng, Y., Wu, X., & Lv, L. (2024). The Chinese version of the 8-item Center for Epidemiologic Studies Depression Scale: Longitudinal psychometric syntheses with 10-year cohort multi-center evidence in an adult sample. *General Hospital Psychiatry*, 91, 204–211. <https://doi.org/10.1016/j.genhosppsych.2024.11.008>
- Choi, B., & Jun, H. J. (2020). The buffering effects of social capital on inequalities in subjective well-being among older people. *Social Indicators Research*, 160(2–3), 565–583. <https://doi.org/10.1007/s12050-020-02352-5>
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38(5), 300–314. <https://doi.org/10.1097/00006842-197609000-00003>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310–357. <https://doi.org/10.1037/0033-2909.98.2.310>
- Cong, Z., & Silverstein, M. (2008). Intergenerational support and depression among elders in rural China: Do daughters-in-law matter? *Journal of Marriage and Family*, 70(3), 599–612. <https://doi.org/10.1111/j.1741-3737.2008.00508.x>
- Cramm, J. M., van Dijk, H. M., & Nieboer, A. P. (2013). The importance of neighborhood social cohesion and social capital for the wellbeing of older adults in the community. *The Gerontologist*, 53(1), 142–152. <https://doi.org/10.1093/geront/gns052>
- Dong, X., Ng, N., Jacobsson, L., & Santosa, A. (2025). Tying the knot for parents: How adult children's marital choices impact parental depression in China. *Innovation in Aging*, 9(5), igaf022. <https://doi.org/10.1093/geroni/igaf022>
- Elder, G. H. Jr., Johnson, M. K., & Crosnoe, R. (2003). The emergence and development of life course theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 3–19). Springer. https://doi.org/10.1007/978-0-306-48247-2_1
- Feldman, M. W., Tuljapourkar, S., Li, S., Jin, X., & Li, N. (2007). Son preference, marriage, and intergenerational transfer in rural China. In A. H. Gauthier, C. Y. C. Chu, & S. Tuljapourkar (Eds.), *Allocating public and private resources across generations: Riding the age waves* (1st ed., Vol. 3, pp. 139–162). Springer. <https://doi.org/10.1007/978-1-4020-4481-6>
- Fingerman, K. L., Zhou, Z., & Gao, S. (2024). Intergenerational ties in late life. *Current Opinion in Psychology*, 55, 101743. <https://doi.org/10.1016/j.copsyc.2023.101743>

- Fu, Y., Ke, X., & Li, Y. (2025). Intergenerational relationships and depressive symptoms among older adults: The moderating role of unmet home- and community-based care needs. *Applied Research in Quality of Life*, 20(4), 1703–1730. <https://doi.org/10.1007/s11482-025-10493-3>
- Gilligan, M., Karraker, A., & Jasper, A. (2018). Linked lives and cumulative inequality: A multigenerational family life course framework. *Journal of Family Theory & Review*, 10(1), 111–125. <https://doi.org/10.1111/jftr.12244>
- Greenfield, E. A., & Marks, N. F. (2006). Linked lives: Adult children's problems and their parents' psychological and relational well-being. *Journal of Marriage and Family*, 68(2), 442–454. <https://doi.org/10.1111/j.1741-3737.2006.00263.x>
- Gumed, D., & Xaba, F. (2025). Exploring the role of social support in coping with challenges faced by stepmothers: A case study in South Africa using the social support theory. *Social and Health Sciences*, 23(1), Article 18676. <https://doi.org/10.25159/2957-3645/18676>
- Hakulinen, C., Pulkki-Råback, L., Jokela, M., Ferrie, J. E., Aalto, A. M., Virtanen, M., Kivimäki, M., Vahtera, J., & Elovainio, M. (2016). Structural and functional aspects of social support as predictors of mental and physical health trajectories: Whitehall II cohort study. *Journal of Epidemiology & Community Health*, 70(7), 710–715. <https://doi.org/10.1136/jech-2015-206165>
- Harding, D. J. (2009). Collateral consequences of violence in disadvantaged neighborhoods. *Social Forces*, 88(2), 757–784. <https://doi.org/10.1353/sof.0.0281>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Holmgren, L., Tirone, V., Gerhart, J., & Hobfoll, S. E. (2017). Conservation of resources theory: Resource caravans and passageways in health contexts. In C. L. Cooper, & J. C. Quick (Eds.), *The handbook of stress and health: A guide to research and practice* (1st ed., pp. 443–457). Wiley Blackwell. <https://doi.org/10.1002/9781118993811.ch27>
- Hu, H., Cao, Q., Shi, Z., Lin, W., Jiang, H., & Hou, Y. (2018). Social support and depressive symptom disparity between urban and rural older adults in China. *Journal of Affective Disorders*, 237, 104–111. <https://doi.org/10.1016/j.jad.2018.04.076>
- Ji, Y. (2015). Between tradition and modernity: Leftover women in Shanghai. *Journal of Marriage and Family*, 77(5), 1057–1073. <https://doi.org/10.1111/jomf.12220>
- Jin, X., & Guo, Q. (2011). Intergenerational economic support of unmarried male in rural area. *Northwest Population*, 32(4), 38–42.
- Joshi, S., Mooney, S. J., Rundle, A. G., Quinn, J. W., Beard, J. R., & Cerdá, M. (2017). Pathways from neighborhood poverty to depression among older adults. *Health & Place*, 43, 138–143. <https://doi.org/10.1016/j.healthplace.2016.12.003>
- Joye, D., Sapin, M., & Wolf, C. (2019). *Measuring social networks and social resources: An exploratory ISSP survey around the world* (GESIS-Schriftenreihe, 22). GESIS – Leibniz-Institut für Sozialwissenschaften. <https://doi.org/10.21241/ssnar.62256>
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health*, 78(3), 458–467. <https://doi.org/10.1093/jurban/78.3.458>
- Kim, J. (2010). Neighborhood disadvantage and mental health: The role of neighborhood disorder and social relationships. *Social Science Research*, 39(2), 260–271. <https://doi.org/10.1016/j.ssresearch.2009.08.007>
- Klijs, B., Mendes de Leon, C. F., Kibele, E. U. B., & Smidt, N. (2017). Do social relations buffer the effect of neighborhood deprivation on health-related quality of life? Results from the LifeLines Cohort Study. *Health & Place*, 44, 43–51. <https://doi.org/10.1016/j.healthplace.2017.01.001>
- Lei, L. (2013). Sons, daughters, and intergenerational support in China. *Chinese Sociological Review*, 45(3), 26–52. <https://doi.org/10.2753/CSA2162-055450302>
- Li, K., Wang, P., Wang, L., Wang, Z., Xu, C., Zhao, X., Zhang, H., & Hu, Y. (2025). Spatiotemporal evolution of the prevalence of depressive symptoms among older adults—China, 2013–2020. *China CDC Weekly*, 7(21), 732–736. <https://doi.org/10.46234/ccdcw2025.120LIN>
- Li, Y. (2023). Neighborhood environment and depressive symptoms of older adults in urban and rural China: A model of social capital. *Innovation in Aging*, 7(Supplement_1), 1087. <https://doi.org/10.1093/geroni/igad104.3493>
- Lin, T., Wang, Q., Tan, Z., Zuo, W., & Wu, R. (2024). Neighborhood social environment and mental health of older adults in China: The mediating role of subjective well-being and the moderating role of green space. *Frontiers in Public Health*, 12, 1502020. <https://doi.org/10.3389/fpubh.2024.1502020>
- Liu, S. (2006). Son preference and fertility in China: Some reconsiderations. *Population Research*, 30(3), 2–9. <https://doi.org/10.3969/j.issn.1000-6087.2006.03.001> (In Chinese).

- Liu, Y., Lu, S., Guo, Y., Ho, H. C., Chui, H. K., Webster, C., Chiu, L. H., & Lum, T. Y. S. (2021). Associations between neighborhood environments and depressive symptoms of older adults. *Innovation in Aging*, 5(Supplement_1), 468. <https://doi.org/10.1093/geroni/igab046.1809>
- Lu, N., Spencer, M., Sun, Q., & Lou, V. W. Q. (2020). Family social capital and life satisfaction among older adults living alone in urban China: The moderating role of functional health. *Aging & Mental Health*, 25(4), 695–702. <https://doi.org/10.1080/13607863.2019.1709155>
- Lund, C., Brooke-Sumner, C., Baingana, F., Baron, E. C., Breuer, E., Chandra, P., Haushofer, J., Herrman, H., Jordans, M., Kieling, C., Medina-Mora, M. E., Morgan, E., Omigbodun, O., Tol, W., Patel, V., & Saxena, S. (2018). Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. *The Lancet Psychiatry*, 5(4), 357–369. [https://doi.org/10.1016/S2215-0366\(18\)30060-9](https://doi.org/10.1016/S2215-0366(18)30060-9)
- Mair, C., Roux, D., A. V., & Morenoff, J. D. (2010). Neighborhood stressors and social support as predictors of depressive symptoms in the Chicago Community Adult Health Study. *Health & Place*, 16(5), 811–819. <https://doi.org/10.1016/j.healthplace.2010.04.006>
- Marc, R. D. (2011). A multigenerational view of inequality. *Demography*, 48(1), 1–23. <https://doi.org/10.1007/s13524-011-0014-7>
- Mouratidis, K. (2020). Neighborhood characteristics, neighborhood satisfaction and well-being: The links with neighborhood deprivation. *Land Use Policy*, 99, 104886. <https://doi.org/10.1016/j.landusepol.2020.104886>
- Nie, P. J., & Wang, Z. W. (2007). Intergenerational wealth transfer in rural China: An empirical study based on survey in rural area of Hebei province. *Northwest Population*, 3, 62–68. (in Chinese).
- Pearlin, L. I., Schieman, S., Fazio, E. M., Meersman, S. C., et al. (2005). Stress, health, and the life course: Some conceptual perspectives. *Journal of Health and Social Behavior*, 46(2), 205–219. <https://doi.org/10.1177/002214650504600206>
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3), 385–401. <https://doi.org/10.1177/014662167700100306>
- Ren, Z., Wang, S., He, M., Shi, H., Zhao, H., Cui, L., Zhao, J., Li, W., Wei, Y., Zhang, W., Chen, Z., Liu, H., & Zhang, X. (2024). The effects of living arrangements and leisure activities on depressive symptoms of Chinese older adults: Evidence from panel data analysis. *Journal of Affective Disorders*, 349, 226–233. <https://doi.org/10.1016/j.jad.2024.01.077>
- Roy, C. (2018). Key issues in nursing theory: Developments, challenges, and future directions. *Nursing Research*, 67(2), 81–92. <https://doi.org/10.1097/NNR.0000000000000266>
- Sampson, R. J. (2012). *Great American city: Chicago and the enduring neighborhood effect*. The University of Chicago Press.
- Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing neighborhood effects: Social processes and new directions in research. *Annual Review of Sociology*, 28, 443–478. <https://doi.org/10.1146/annurev.soc.28.110601.141114>
- Sharkey, P., & Faber, J. W. (2014). Where, when, why, and for whom do residential contexts matter? Moving away from the dichotomous understanding of neighborhood effects. *Annual Review of Sociology*, 40(1), 559–579. <https://doi.org/10.1146/annurev-soc-071913-043350>
- Shek, D. T. L., & Ma, C. M. S. (2010). The Chinese family assessment instrument (C-FAI): Hierarchical confirmatory factor analyses and factorial invariance. *Research on Social Work Practice*, 20(1), 112–123. <https://doi.org/10.1177/1049731509355145>
- Silverstein, M., Cong, Z., & Li, S. (2006). Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological well-being. *The Journals of Gerontology: Series B Psychological Sciences*, 61(5), S256–S266. <https://doi.org/10.1093/geronb/61.5.s256>
- Silverstein, M., Conroy, S. J., Wang, H., Giarrusso, R., & Bengtson, V. L. (2002). Reciprocity in parent-child relations over the adult life course. *The Journals of Gerontology: Series B Psychological Sciences and Social Sciences*, 57(1), S3–S13. <https://doi.org/10.1093/geronb/57.1.S3>
- Small, M. L. (2009). *Unanticipated gains: Origins of network inequality in everyday life*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195384352.001.0001>
- Tan, Q. (2023). Parents' influence on children's marital decision: Case study: China. *Cogent Social Sciences*, 9(1), Article 2179433. <https://doi.org/10.1080/23311886.2023.2179433>
- Tao, D., He, L., Hamilton, J., & Xu, D. (2021). Children's marriage and parental subjective well-being: Evidence from China. *China Economic Review*, 70, 101705. <https://doi.org/10.1016/j.chieco.2021.101705>
- Van Ham, M., Manley, D., Bailey, N., Simpson, L., & Maclennan, D. (Eds.). (2012). *Neighborhood effects research: New perspectives*. Springer.

- Wan, C., & Su, S. (2016). Neighborhood housing deprivation and public health: Theoretical linkage, empirical evidence, and implications for urban planning. *Habitat International*, 57, 11–23. <https://doi.org/10.1016/j.habitatint.2016.06.010>
- Wei, Y., Jin, X. Y., & Li, S. Z. (2008). Stress and coping in families with old unmarried male: Evidence from YC county in rural Henan China. *Population & Development*, 14(5), 2–12. <https://doi.org/10.3969/j.issn.1674-1668.2008.05.001> (In Chinese).
- Wilson, W. J. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy* (2nd ed.). The University of Chicago Press.
- Wodtke, G. T., Harding, D. J., & Elwert, F. (2011). Neighborhood effects in temporal perspective: The impact of long-term exposure to concentrated disadvantage on high school graduation. *American Sociological Review*, 76(5), 713–736. <https://doi.org/10.1177/0003122411420816>
- Wu, Y., Lei, P., Ye, R., Sunil, T. S., & Zhou, H. (2019). Prevalence and risk factors of depression in middle-aged and older adults in urban and rural areas in China: A cross-sectional study. *The Lancet*, 394, S53. [https://doi.org/10.1016/S0140-6736\(19\)32389-X](https://doi.org/10.1016/S0140-6736(19)32389-X)
- Ye, J. P., Song, J. N., & Tian, C. G. (2010). An analysis of housing policy during economic transition in China. *International Journal of Housing Policy*, 10(3), 273–300. <https://doi.org/10.1080/14616718.2010.506744>
- Yu, J., & Xie, Y. (2019). The second demographic transition in China. *Population Research*, 43(05), 3–16.
- Zhang, Y., & Goza, F. W. (2006). Who will care for the elderly in China? A review of the problems caused by China's one-child policy and their potential solutions. *Journal of Aging Studies*, 20(2), 151–164. <https://doi.org/10.1016/j.jaging.2005.07.002>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.