

Separated Kin: Location of Multiple Children and Mental Health Trajectories of Older Parents in Rural China

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ABSTRACT

Objective: This study examines the longitudinal association between the location of multiple children and depressive symptoms of older parents in rural China, where massive rural-to-urban migration has profoundly altered the family life of the aging population.

Methods: Using seven waves of panel data from the Longitudinal Study of Older Adults in Anhui Province (2001-2018, $N = 8,253$) and multilevel growth curve models, this study compares mental health trajectories of old parents across different compositions of local and migrant children over an 18-year time period.

Results: The results show that older parents with a greater share of adult children who had migrated away not only scored worse mental health on average, but also experienced a more rapid increase in depressive symptoms across ages, after accounting for other covariates. Further, older adults who had their most children migrated away for a longer period of time suffered from the steeper rate of increase in depressive symptoms as they got older.

Conclusions: We suggest that it is not the geographic locality of a single child but the location of multiple children that matters for parental mental health in later life.

Keywords: Intergenerational proximity; multiple children; rural China; depressive symptoms

Introduction

As the processes of urbanization and globalization have intensified across the world, a burgeoning literature has documented the impact of emigration on the health of family members left behind in emigrant communities (Arias, 2013; Baldock, 2000; Liang, 2016; Lu, 2010). Compared with the well-documented negative impact of rural-urban migration on left-behind children and spouses (Chang et al., 2011; Chen et al., 2015; Tong et al., 2015), the impact on left-behind older parents is not conclusive (Kuhn et al., 2011; Song, 2017b). Increasing intergenerational geographic location may be associated with better well-being of older adults by adding more resources to families while it may be also harmful to parents by disrupting the traditional way of familial elder support (Böhme et al., 2015; Connelly & Maurer-Fazio, 2016). This question is especially important in developing countries where both market and institutional eldercare are not well-developed and adult children are culturally expected to take the major responsibility of old age support.

This study focuses on China, which represents the largest aging population as well as one of the fastest-growing aging countries in the world (United Nations, 2019). According to the 2020 census, there were 190.6 million Chinese aged 65 years and older, or 13.5% of the entire population (National Bureau of Statistics of China, 2021). Depression among older adults in China has been rising and studies have consistently reported that rural older adults have higher levels of depressive symptoms than their urban counterparts (Chen et al., 2005; Li et al., 2016). Among many reasons accounting for older adults' depressive symptoms, such as socioeconomic status, physical health, and social environments (Lei et al., 2014; Wang et al., 2018), there has been a great deal of attention to the importance of family relations for mental health in later life (Silverstein et al., 2006; Tang et al., 2020). Adult children are important members of older

adults' lives, and thus it is curial to examine how intergenerational relationships are related to older parents' mental health.

During the last three decades, China has experienced the largest rural-to-urban migration in human history (Liang, 2016). A recent report from the National Bureau of Statistics of China estimated that about 277 million people have migrated from villages to cities in search of work, often leaving their family members behind (National Bureau of Statistics of China, 2016). In the context of massive rural-urban migration, this study focuses on one key dimension of intergenerational relationships, intergenerational proximity, and explores how the location of multiple children is associated with the trajectories of depressive symptoms of older parents, accounting for other aspects of intergenerational interactions and sociodemographic characteristics. Using seven waves of longitudinal data that span 18 years (2001-2018), this study compares trajectories of depressive symptoms of older adults across different compositions of local and migrant children, and further examines how the persistence in a certain composition category could affect the mental health of older adults.

Children's Location and Well-being of Older Parents: Theoretical Considerations and Empirical Evidence

Broadly there are two theoretical frameworks that may help predict the relationship between children's location and the well-being of older parents: the family disruption model and the new economics of labor migration model. According to the family disruption model, changes in family structure bring negative consequences for individuals' well-being (Gilman et al., 2003). In social contexts with strong filial piety (such as China), adult children are expected to coreside or reside close to their older parents. The migration of adult children disrupts this family

arrangement which may results in adverse health consequences. Similarly, classical aging studies keeping in line with family modernization theory point to the “detachment” of older parents from their adult children as a result of increasing geographic distance (Shanas et al., 1968).

Several studies have found negative effects of children’s migration on parental health. A study in Indonesia finds that adult children’s migration disrupts traditional way of family interactions and increases the parents’ stressors, and as a result, left-behind older parents are more susceptible to psychological distress and depressive symptoms than those with all local children (Lu, 2012).

Evidence from rural China also shows that having children migrated to the urban area significantly increases the probability of the left-behind parents being in poor health. And the negative impact of children’s migration on parental well-being is much stronger in impoverished villages than in wealthier communities (Song, 2017b). Even in some developed countries, like the Irish, international migration of adult children may also negatively impact parental well-being, which is often shown as depressive symptoms and loneliness feelings (Mosca & Barrett, 2016). Taken together, the disruption model and empirical evidence across the world lead us to expect the following:

Hypothesis 1a: Older parents with a greater share of migrant children relative to local children have worse mental health than those with more children living nearby.

However, it is also possible that older parents may benefit from children’s migration. The new economics of labor migration model suggests that migrants share risks and resources with the left-behind families and the migration decision is often considered as a mutually beneficial arrangement between migrant family members and those who are left behind (Kuhn et al., 2011). Based on this theoretical framework, if children’s migration is a part of the household strategy to maximize family well-being, then increasing geographical distance may not necessarily be a

barrier to maintain contact or a close relationship (Cong & Silverstein, 2011; Guo et al., 2012). Studies have found that left-behind parents in rural China receive more financial support from migrant children than local children (Cong & Silverstein, 2011) and they also benefit from reciprocated intergenerational transfers through caregiving for grandchildren left behind (Cong & Silverstein, 2008). Remittance from migrant children increases the economic well-being of the household and this could, in turn, buffers the negative effects of migration (Lu et al., 2012). Therefore, we have an alternative hypothesis about the positive effect of children's migration on mental health of older parents:

Hypothesis 1b: Older parents with a greater share of migrant children relative to local children have better mental health than those with more children living nearby.

Finally, most previous studies on children's location and parental health often used cross-sectional design or longitudinal data with short intervals, and thus failed to track the health implications of migration over a long period of time. Indeed, migration effects on family members left behind may differ between short- and long-term migration. Both the family disruption model and the new economics of labor migration model indicate the importance of separation duration in influencing older parents' health, although they point to different predictions with regard to the direction of the effect. Applying the cumulative disadvantage theory (Dannefer, 2003) to the family disruption model, the adversities associated with the family disruption may pile up and have long-term persistent or cumulative consequences for older parents' mental health. By contrast, the new economics of labor migration model suggests that although the family disruption process may be stressful for a short time which may temporarily hurt mental health of older parents, as time passes, both the children and parents would be more settled and adjusted to the new arrangement than before. Given the above

consideration, we once again have two competing hypotheses regarding the duration of children's migration:

Hypothesis 2a: Parents with a greater share of migrant children relative to local children for a longer period of time takes a heavier toll on the mental health of older parents.

Hypothesis 2b: Parents with a greater share of migrant children relative to local children for a longer period of time takes a lesser toll on the mental health of older parents.

Covariates

Previous research revealed that individual sociodemographic characteristics and family relationships are associated with depressive symptoms among Chinese older adults, including gender, marital status, education, income, physical health, number of adult children, and intergenerational relationships. Older women had higher depression scores than older men, and being unmarried, having a lower education level and income were all found to be related to an increased risk of depression (Lei et al., 2014). Physical health declines were also positively associated with increases in depression during late life (Song, 2017b). Additionally, we also considered family characteristics which may be associated with Chinese older adults' mental health. As the Chinese proverb "the more children, the more fortune" goes, parents tend to be better off with more adult children (Guo, 2014). Receiving financial, instrumental, and emotional support from adult children was also found to influence the psychological well-being of older parents (Lin & Chen, 2018; Silverstein et al., 2006).

The Current Study

This study tries to extend previous literature in two major aspects. First, existing studies have mainly looked at proximity in individual child-parent dyads, highlighting for example whether having at least one migrant child is associated with adverse health outcomes (Ao et al., 2016; Song, 2017a), without taking into consideration the location of other children within families. We extend the existing line of research by looking at the intergenerational proximity as a composition of all children's locations in which some have migrated away whereas others still live with or close to older parents, with presumably mixed implications for parental mental health. Second, many previous studies have only used cross-sectional data by which it may ignore the long-term effect of children's migration on parental well-being (Lu et al., 2012; Song, 2017b). This study uses longitudinal data that span 18 years to examine both the mental health trajectories of old parents and the effect of duration of children's migration on parental mental health.

Methods

Sample

We used data from an ongoing longitudinal study, “the Well-Being of Older Adults in Anhui Province,” conducted jointly by the University of Southern California and Xi'an Jiaotong University in China. The survey location, Anhui Province in China, was chosen specifically for its relatively high density of older adults and a high level of out-migration of working-age adults. Data were collected from a random sample of older adults living in 72 villages within Chaohu, a primarily agricultural municipal district with massive out-migration. The total population in Chaohu was 3.9 million in 2010 and among them, 2.3 million were living in rural districts (Chaohu Bureau of Statistics, 2015). Since 2000, the rural population has declined about 1

million, most of which were due to the rural-to-urban labor migration (Chaohu Bureau of Statistics, 2015).

The survey was originally fielded in April 2001 ($N = 1,715$; response rate 95%) and follow-up surveys were conducted in 2003 ($N = 1,391$), 2006 ($N = 1,067$), 2009 ($N = 1,174$), 2012 ($N = 936$), 2015 ($N = 1,243$), and 2018 ($N = 1,234$) with added respondents and replenished sample. The primary reason for sample attrition during the seven waves was mortality (36.1%). The current study used all these seven waves of the survey but restricted analyses to older adults who had at least one adult child.¹ On average, an individual was observed about three times in the panel and had 3.75 adult children within families. With low missing rates across seven waves of the survey (under 2%) on the dependent and/or independent variables, we did not impute any missing data and used listwise deletion (see the recommendation by Lynch et al., 2016), resulting in an analytic sample of 8,253 person-year records.

Measures

The mental health of older adults was assessed by depressive symptoms and they were measured by a subset (nine items) from the Center for Epidemiologic Studies-Depression (CES-D) scale (Radloff, 1977). Three items indicated feelings of positive affect (feeling happy, enjoying life, feeling pleasure), two items indicated feelings of negative affect (feeling lonely, feeling upset), two items indicated feelings of marginalization (feeling useless, having nothing to do), and two items indicated somatic symptoms (having a poor appetite, having trouble sleeping). We coded the frequency with which the participant had experienced each symptom in the past week as 0 (rarely or none of the time), 1 (some of the time), or 2 (most of the time). After the coding of

¹ In an exploratory analysis, we further restricted analytical sample to older parents who had at least two or three adult children, and results were largely identical.

positive affect items had been reversed, the nine items were summed, which produced a depressive symptom score ranging from 0 to 18, with a higher score indicating more depressive symptoms. Previous studies show that the CES-D scale has good reliability and validity and is suitable for studying older adults in rural China (Cong & Silverstein, 2008; Tang et al., 2020).

The location of multiple children was measured as a categorical variable indicating the different composition of local and migration children. Consistent with previous studies using the same dataset (Cong & Silverstein, 2011; Guo et al., 2009), migrant children were defined as those who lived in different counties or cities from their parents, whereas local children were defined as those who lived with parents or lived within the same city/county. Based on different combinations of local and migration children, respondents were categorized into four distinct groups: 1) those with all local children (reference); 2) those with more local than migrant children; 3) those with a greater or equal number of migrant children relative to local children²; and 4) those with all children migrated away. Moreover, to examine how persistence in a certain category affects older parents, we operationalized the duration of multiple children's location using the number of waves they were involved in certain groups across seven waves of the survey (0-7 waves, see Chen et al., 2015 and Song, 2017a for examples of similar methods for measuring family members' migration duration in the context of China).

This study controlled for both older parents' sociodemographic characteristics and their relationships with adult children. Basic demographic covariates included age (in years), gender (1=female), marital status (1=married), and the number of adult children. Socioeconomic resources were measured by two variables: whether older adults received any formal education

² Parents with the same number of migrant and local children were combined with those with more sharing of migrant children into the same category because preliminary analyses yielded very similar results for these two groups.

and family income (from work and pension, logged). Consistent with previous research on the mental health of older adults in China (Li et al., 2016; Lin & Chen, 2018; Song et al., 2021), we also controlled for functional limitations reported by older adults performing daily activities. They were measured by asking respondents to indicate their level of difficulty (none = 0, some = 1, cannot do = 2) in performing 10 tasks of activities of daily living (ADL) and 5 tasks of instrumental activities of daily living (IADL). We summed up 10 items ($\alpha = .94$) to indicate ADL difficulties (0-20) and 5 items ($\alpha = .92$) to indicate IADL difficulties (0-10).

Intergenerational relationships were measured using three variables: offspring monetary support, offspring instrumental support, and intergenerational emotional closeness. Monetary support was measured by the total amount of money parents received from their children during the previous year. Instrumental support was measured as whether parents received any help in either household tasks or personal care from their offspring during the previous year. Emotional closeness was measured by three questions adapted from the “Affectual Solidarity Inventory” (Gronvold, 1988), including “Taking everything into consideration, how close do you feel to (this child)?”; “How much do you feel that (this child) would be willing to listen when you need to talk about your worries and problems?”; and “Overall, how well do you and (this child) get along together?” These items were coded as 0 (not at all close/not at all/not at all well), 1 (somewhat close/somewhat/somewhat well), or 2 (very close/very much/very well). We summed them into a scale ranging from 0 to 6 for each child ($\alpha = .91$), and then calculated mean scores across children.³

Analytical Strategies

³ In our preliminary analysis, we tried maximum, minimum, and mean scores and the results are largely similar.

To take advantage of seven waves of longitudinal data, this study estimated age-based growth curve models (Fitzmaurice et al., 2011) to predict the mental health trajectory of older adults. Growth curve modeling can distinguish the within (level-1) and between (level-2) individual heterogeneities in estimating health trajectories using the panel structure of the data. One important problem of previous literature on children's migration and parental health not yet well-addressed is the issue of "self-selection bias" whereby parents with better health are more likely to have migrant children, making it difficult to establish causal linkage between children's migration and parental health (Kuhn et al., 2011). The growth curve models take into account the unobserved heterogeneity across individuals - which is often a source of selection bias - by allowing individuals to serve as their own controls (Fitzmaurice et al., 2011). Growth curve models also allow for unbalanced data as they effectively utilize all available observations to estimate trajectories, regardless of the attrition status (Raudenbush & Bryk, 2002). Following prior studies conducting similar growth curve analyses (Chen et al., 2019; Song, 2017a), we addressed the potential bias due to attrition and death by entering two dummy variables indicating the deceased and loss to follow up.

This study begins with a change trajectory model of depressive symptoms of older adults using age as the analysis time metric.⁴ The key independent variable, composition of local and migrant children and other time-varying variables, was also added here. We incorporated the interaction of the location of children with age in level 1 to examine how the rate of changes in depressive symptoms may vary across different compositions of local and migrant children. The level-1 model can be specified as follows:

⁴ We conducted additional sensitivity analyses to examine the functional shape of age trajectory of depressive symptoms with different parametrizations (linear, quadratic, and cubic). We found that a linear measure of age provided the best fit to the data (results available upon request).

$$Y_{ij} = \beta_{0i} + \beta_{1i} Age_{ij} + \beta_{2i} Composition_{ij} + \beta_{3i} Age_{ij} * Composition_{ij} + Z_{ij}A + e_{ij} \quad (1)$$

Where Y_{ij} represents the dependent variable (i.e., depressive symptoms of individual i at wave j , and $j = 1, 2 \dots 7$ indexes the longitudinal data waves 1 to 7). Age was centered on 74 so that the intercept reflected the level of depressive symptoms at the average age of 74. Time-varying covariates (e.g., income) indicated by Z_{ij} were included at the level-1 model.

Level-2 sub-models were estimated for between individual differences in change, where the intercept and coefficients are further modeled as dependent variables. All time-constant covariates (e.g., gender) were included at level 2 to predict intercept and age slope (indicated as X_0 and X_1 respectively). The level-2 model can be specified as follows:

$$\beta_{0i} = \gamma_{00} + X_0B_0 + u_{0i} \quad (2)$$

$$\beta_{1i} = \gamma_{10} + X_1B_1 + u_{1i} \quad (3)$$

Growth curve models in this study consist of two major steps. First, this study is interested in examining whether the composition of local and migrant children predicts the intercept (i.e., average level of depressive symptoms) and the slope (rate of change in depressive symptoms). Second, this study further models whether older parents in a certain composition category for a longer period of time are particularly vulnerable to an accelerated rate of mental health decline. We used the Bayesian information criterion (BIC) as an indicator of global goodness of fit. Because older parents from the same villages may share similar features which are associated with their mental health (such as economic conditions of villages, see Song et al., 2021), we further clustered the standard errors by villages to allow for arbitrary within-village correlation.

Results

Table 1 displays characteristics of older parents by the location of multiple children. The results show that older parents with all local children had the highest level of depressive symptoms, followed by those with more local than migrant children, more or equal number of migrant children relative to local children, and all migrant children. Note, these differences may be due to variations in sociodemographic characteristics and intergenerational relationships across four groups of older adults. For example, older parents with all local children were significantly older than those who had migrant children; and age is a strong predictor for depressive symptoms. In addition, in comparison to older parents with all local children, all other groups tended to have, on average, higher education and income levels, less functional limitations, more adult children, and they were more likely to be married. Consistent with previous studies (Guo et al., 2009; Lin & Chen, 2018), older parents with higher proportions of migrant than local children tended to receive extra financial and emotional support from their children which also contributed to their low levels of depressive symptoms. In terms of duration for the location of multiple children, on average, parents had a mixture of local and migrant children for a longer time than those with all local or all migrant children.

-Table 1 about here-

Figure 1 shows changes in this composition of local and migrant children across seven waves of the survey from 2001 to 2018. There is a clear trend of increasing children's migration status within rural Chinese families. In the first two waves (2001 and 2003), more than 60% of the older parents had fewer migrant children or no migrant children within their families, but as the urbanization intensified in China, this proportion had declined progressively, and in the latest wave (2018), only about 30% of respondents had all or more local than migrant children.

-Figure 1 about here-

Results from growth curve models predicting the effect of multiple children's location on the mental health of older parents are shown in Table 2. Model 1 shows that when controlling for sociodemographic characteristics and intergenerational relationships, parents with more migrant than local children are, on average, 0.167-0.227 points higher in depressive symptoms than those with no migrant children. But the coefficients are only marginally significant ($p < .10$). The significant interaction effect of age and a greater or equal number of migrant children relative to local children in Model 2 suggests that more children's migration leads to a more rapid increase in depressive symptoms of older parents. In other words, they are disadvantaged in mental health trajectories compared with those without any migrant children.

-Table 2 about here-

To aid interpretation, we display mental health trajectories for older parents with all local children (reference group) and those having more or equal number of migrant children relative to local children in Figure 2 by using the coefficients in Model 2 of Table 2, holding all other variables at their mean and modes. Figure 2 shows a clear disadvantage in trajectories of depressive symptoms for older adults with more or equal number of migrant children relative to local children. Before the age 70, there were no significant differences (overlapping confidence intervals) between two groups of older adults. However, as they got older, especially after age 75, older parents with a more or equal number of migrant children experienced a sharp rise in depressive symptoms, while those with all local children nearly kept the same across ages.

-Figure 2 about here-

Findings for other covariates in Table 2 are mostly consistent with previous studies. Women tended to report worse mental health than men. There were significant mental health

advantages for people with higher household income and who received any formal education. Consistent with previous studies emphasizing the beneficial effect of children's migration on left-behind older parents through the role of remittance or emotional support from adult children (e.g., Knodel & Saengtienchai, 2007), this study also finds positive effects of offspring monetary support and intergenerational closeness on parental mental health.

Although preceding results clearly suggest that older parents with a greater or equal number of migrant children relative to local children are disadvantaged in their mental health trajectories compared with parents with all local children, further investigation is made in terms of how the duration of being in this category matters for parental well-being. Table 3 presents the results from growth curve models predicting the effect of duration of being in certain location categories on older parents' depressive symptoms. As the significant interaction effect in Panel C shows, having more or equal number of migrant children relative to local children for a longer period of time leads to an increasingly disadvantaged mental health trajectory compared with parents with fewer migrant children in all waves.

-Table 3 about here-

Discussion

Research on international and internal migration both focus more on the outcomes for emigrants at their destination than the consequences for the family members left behind in the emigrant communities (Antman, 2010; Lu, 2010). Among this left-behind population, with the rapid aging worldwide, a critical public policy concern is the health implications of adult children's migration for the left-behind older parents. As the volume of rural-to-urban migration increases astoundingly over the last two decades in China, changes in both parents' and adult children's lives are common and frequent. Using longitudinal data spanning a period of 18 years from 2001

to 2018, this paper provides evidence of how the location of multiple children could be associated with mental health trajectories of older parents, and further explores the long-term impact of children's migration on older parents left behind in rural China where the rural-urban migration is prevalent.

This paper offers a clear contribution to the literature by examining the mental health trajectory of older adults across different compositions and local and migrant children. Consistent with the family disruption model, older parents with a greater share of adult children who had migrated away not only scored worse mental health on average, but also experienced a more rapid increase in depressive symptoms across ages after accounting for other covariates (consistent with Hypothesis 1a). This finding adds to the literature by paying attention to the location of multiple children. We go beyond the simple dichotomy of left-behind versus non-left-behind parents in previous literature (Guo et al., 2009; Lu, 2012) to disentangle the processes of children's migration within families and their complex associations with parental mental health. This study suggests that it is not the geographic locality of a single child but the location of multiple children that matters for parental mental health in later life, shedding new light on the intergenerational proximity and parental well-being. In line with previous findings of negative health consequences of family separation (Chen et al., 2015; Tong et al., 2015), we underscore the detrimental effect of the geographic separation from adult children on the mental health of older parents.

Moreover, older parents who had their most children migrated away for a longer period of time suffered from the steeper rate of increase in depressive symptoms as they got older, and the longer the separation, the more detrimental the health consequences (supporting Hypothesis 2a). In addition to further support the family disruption model, the adverse associations of

children's long-term migration also provide new evidence to support the cumulative disadvantage theory (Dannefer, 2003), suggesting a cumulative effect of children's migration on parental mental health. So instead of focusing on the association between children's location and parental health in a cross-sectional design, this study echoes recent calls to examine the longitudinal associations between intergenerational proximity and older parents' well-being from a life course perspective (Fingerman et al., 2020; Kolk, 2017; Zhang et al., 2020). Although it is beyond the scope of this paper, future research should continue to explore potential explanations for the link between the location of multiple children and parental mental health. Previous studies on multiple children show substantial differences in the level of support and exchanges between older parents and their multiple children (Wang et al., 2020; Ward et al., 2009). The within-family variation in intergenerational proximities may represent the existence of weak family ties, which is linked to worse mental health among older parents.

This study, however, is not without limitations. The first limitation is in the representativeness of the data used in this study. Although the sampling district is a representative place of out-migration rural districts, the results of this study may not be generalized to all Chinese villages, considering China's large territory and its geographical diversity in terms of cultures and social security systems. Second, several important attributes of both migrant children and left-behind elders, like gender and grandchildren, may also affect the linkage between children's migration and parental health. These factors deserve further investigation. Third, although we have used multiple indicators to control for sociodemographic characteristics and intergenerational relationships that may account for depressive symptoms in later life, data limitation prohibited the inclusion of some potential important covariates. For example, social networks have been found to be closely associated with mental health in later life

(e.g., Tang et al., 2020), but these measures were only available in two most recent waves of the survey. Future studies using this new information should further explore whether and how social relationships beyond children (e.g., extended kin and friends) may compensate for the absence of migrant children and help older adults maintain better mental health.

Despite these limitations, this study has carried important policy implications. As the process of urbanization and globalization has intensified all over the world, the well-being of the left-behind population has become a critical policy concern in the emigrant communities. It is unlikely that the trend of rural-urban migration will be reversed in the foreseeable future. Given the complexity and heterogeneity of children's migration patterns and intergenerational relationships, social policies should be designed to cater the different needs of parents, considering the location of their multiple children. Also, this study identifies that among left-behind older parents, those with a greater share of migrant children for a longer period of time are more vulnerable to depression and effective intervention strategies should be designed to help them. Instead of re-asserting adult children's filial responsibilities of caring for older parents, government policies should move beyond family support to promote a stronger social network and more active social participation and interaction among older adults in the local communities. However, the root of disadvantages of the left-behind population lies in the rigid rural-urban division in China. Therefore, policies and programs that aim to reduce socioeconomic differences between rural and urban areas, such as revitalizing the rural economy, improving village infrastructure, and expanding pension coverage among the rural population, should be helpful to draw migrants back to their hometowns and improve the mental health of left-behind older parents, and older adults as a whole.

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Table 1. Descriptive Statistics of the Analytic Sample by the Location of Multiple Children, 2001-2018 (*N* of person-years = 8,253)

Variables	Total	All local children	# of local > # of migrant children	# of local \leq # of migrant children	All migrant children
Depressive Symptoms	6.124 (3.928)	6.802 (4.028)	6.355* (3.952)	5.792* (3.805)	5.436* (3.810)
<i>Sociodemographic characteristics</i>					
Age	74.166 (7.681)	76.470 (8.185)	75.283* (7.553)	73.397* (7.145)	70.541* (6.543)
Female (%)	52.37	56.96	55.95	49.66*	45.41*
Married (%)	62.83	51.80	58.18*	66.68*	78.69*
Income	5.465 (3.710)	4.288 (3.895)	4.695* (3.833)	6.071* (3.385)	7.196* (2.869)
Formal education (%)	30.03	25.37	27.79	31.85*	36.75*
ADL difficulties	2.870 (4.303)	3.898 (4.843)	3.412* (4.634)	2.241* (3.739)	1.780* (3.443)
IADL difficulties	1.791 (2.717)	2.619 (3.221)	2.152* (2.930)	1.303* (2.213)	0.996* (1.963)
Number of adult children	3.751 (1.525)	3.110 (1.535)	4.536* (1.313)	3.994* (1.391)	2.917* (1.288)
<i>Intergenerational relationships</i>					
Monetary support	6.876 (2.046)	6.075 (2.276)	7.026* (1.609)	7.151* (1.913)	7.249* (2.265)
Instrumental support (%)	27.24	38.33	33.77*	22.75*	9.56*
Emotional closeness	4.583 (1.274)	4.429 (1.393)	4.469 (1.198)	4.633* (1.214)	4.892* (1.270)
<i>Duration of being in certain location categories</i>					
All local children	1.018 (1.546)				
# of local > # of migrant children	1.181 (1.549)				
# of local \leq # of migrant children	1.535 (1.783)				
All migrant children	0.606 (1.156)				

Notes: Values for categorical variables are in percent. The mean values, followed by standard deviations in parentheses, are presented for all other variables. “ADL” indicates activities of daily living, and “IADL” indicates instrumental activities of daily living.

*Indicates statistically significant difference compared to older parents with all local children at the .05 level based on chi-square test or t-test.

Table 2. Growth Curve Models Predicting Depressive Symptoms of Older Parents by the Location of Multiple Children, 2001-2018 (*N* of person-years = 8,253)

	Model 1		Model 2	
	B	(SE)	B	(SE)
Location of multiple children (ref. = all local children)				
# of local > # of migrant children	0.067	(0.112)	0.057	(0.114)
# of local \leq # of migrant children	0.167†	(0.089)	0.170†	(0.089)
All migrant children	0.227†	(0.131)	0.142	(0.138)
Age (centered on the mean)	0.017**	(0.007)	0.004	(0.011)
Location * Age (centered on the mean)				
# of local > # of migrant children			0.010	(0.014)
# of local \leq # of migrant children			0.034**	(0.013)
All migrant children			-0.006	(0.017)
<i>Sociodemographic characteristics</i>				
Female	0.427***	(0.099)	0.432***	(0.099)
Married	-0.538***	(0.102)	-0.538***	(0.102)
Income	-0.036**	(0.013)	-0.038**	(0.013)
Formal education	-0.409***	(0.105)	-0.410***	(0.105)
ADL difficulties	0.318***	(0.017)	0.318***	(0.017)
IADL difficulties	0.041	(0.027)	0.043	(0.027)
Number of adult children	-0.104**	(0.031)	-0.107**	(0.031)
<i>Intergenerational relationships</i>				
Monetary support	-0.121***	(0.019)	-0.122***	(0.019)
Instrumental support	0.131	(0.086)	0.132	(0.086)
Emotional closeness	-0.681***	(0.030)	-0.682***	(0.030)
Died (in 2001-2018)	-0.008	(0.114)	0.001	(0.114)
Loss to follow up (in 2001-2018)	0.096	(0.131)	0.101	(0.131)
Intercept	9.773***	(0.243)	9.814***	(0.243)
Random Effects-Variance Components				
Level 1: Within-person		8.874***		8.865***
Level 2: In intercept		1.438***		1.446***
Level 2: In linear growth rate		0.005**		0.005**
BIC (smaller is better)		42,838		42,825

Note: “ADL” indicates activities of daily living, and “IADL” indicates instrumental activities of daily living.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$ (two-tailed tests)

Table 3. Growth Curve Models Predicting Depressive Symptoms of Older Parents by the Duration of Being in Certain Location Categories, 2001-2018 (*N* of person-years = 8,253)

	Model 3		Model 4	
	B	(SE)	B	(SE)
Panel A: All local children				
Duration of being in this category	-0.082*	(0.032)	-0.080*	(0.033)
Age (centered on the mean)	0.020**	(0.007)	0.021**	(0.008)
Duration * Age			-0.001	(0.003)
BIC (smaller is better)		42,818		42,827
Panel B: # of local > # of migrant children				
Duration of being in this category	-0.025	(0.033)	-0.026	(0.033)
Age (centered on the mean)	0.017*	(0.007)	0.016*	(0.008)
Duration * Age			0.001	(0.004)
BIC (smaller is better)		42,824		42,832
Panel C: # of local \leq # of migrant children				
Duration of being in this category	-0.007	(0.027)	-0.006	(0.027)
Age (centered on the mean)	0.016*	(0.007)	-0.006	(0.008)
Duration * Age			0.015***	(0.003)
BIC (smaller is better)		42,824		42,810
Panel D: All migrant children				
Duration of being in this category	0.051	(0.041)	0.059	(0.042)
Age (centered on the mean)	0.016*	(0.007)	0.014†	(0.007)
Duration * Age			0.005	(0.005)
BIC (smaller is better)		42,822		42,831

Note: All models control for sociodemographic characteristics of older parents and their relationships with adult children.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$ (two-tailed tests)

Figure 1. Changes in Composition of Local and Migrant Children, 2001-2018 (*N* of person-years = 8,253)

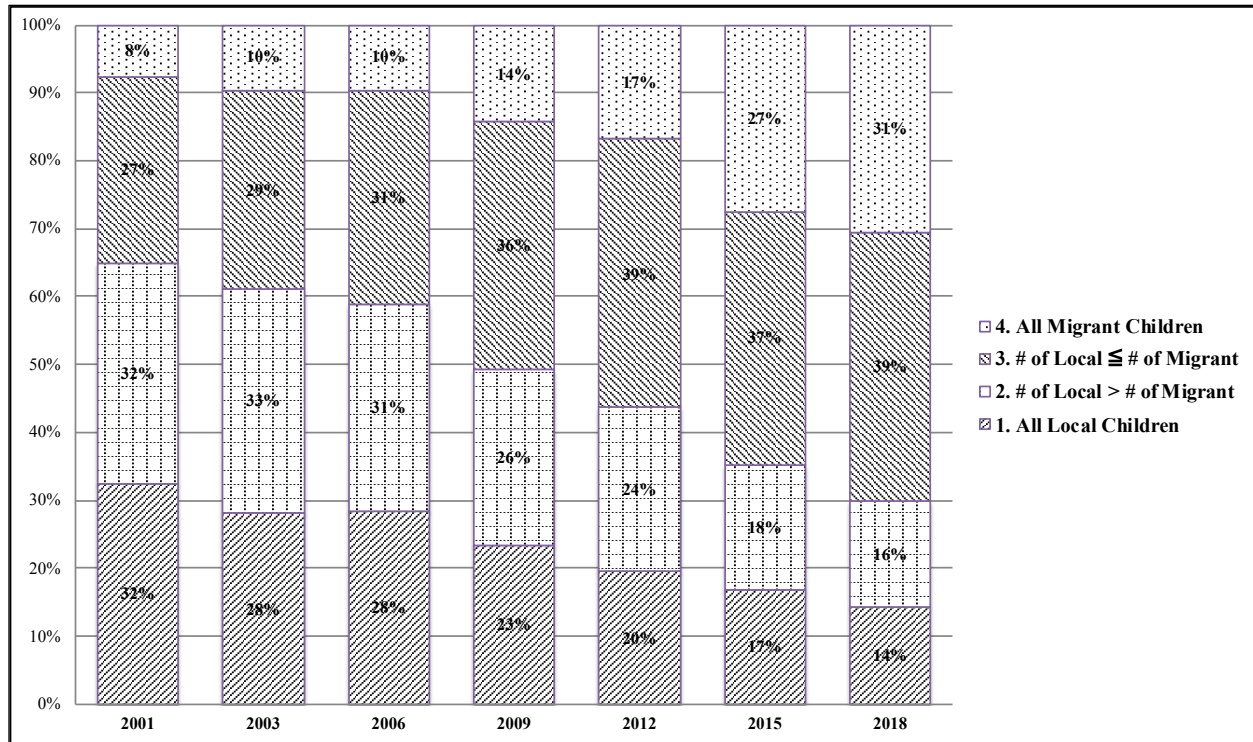


Figure 2. Predicted Trajectories of Depressive Symptoms (with 95% confidence intervals) for Older Parents with All Local Children and More or Equal Number of Migrant Children Relative to Local Children, 2001-2018 (*N* of person-years = 8,253)

