Ageing & Society **29**, 2009, 1085–1104. © Cambridge University Press 2009
doi:10.1017/S0144686X0900871X Printed in the United Kingdom

The impact of out-migration on the inter-generational support and psychological wellbeing of older adults in rural China

MAN GUO*, MARIA P. ARANDA* and MERRIL SILVERSTEIN†

ABSTRACT
This paper examines the impact of the out-migration of adult children on older parents' inter-generational support and psychological wellbeing in rural China. The sample comprised 1,237 older Chinese people aged 60 or more years in the rural province of Anhui, China, who completed baseline and follow-up questionnaires in 2001 and 2003, respectively. The differences between older parents with and without migrant children in 2001 in their support and psychological wellbeing in 2003 were examined using independent *t*-tests, as were changes over the two years in support and wellbeing. Multiple regression models were used to examine the impact of baseline out-migration on the psychological wellbeing of older parents at follow-up. The results showed that, compared to parents without migrant children in 2001, the parents of migrants had significantly more monetary support, less instrumental support, and a lower level of depression in 2003. Such differences may be attributed to different support resources and health status, but the regressions revealed that when the positive effect of inter-generational support was taken into account, older parents with more migrant children tended to have significantly more depression and lower life satisfaction. The findings point to the importance of continued inter-generational support after out-migration in maintaining parental wellbeing.

KEY WORDS – out-migration, elderly parents, inter-generational support, psychological wellbeing, rural China.

Introduction

Massive rural-to-urban migration and population ageing are reshaping the face of China. The volume of Chinese rural-to-urban migration more than quadrupled from 34 million in 1989 to 147 million in 2005 (Cai 2002; National Statistics Bureaus of China 2006), the later total being roughly

* School of Social Work, University of Southern California, Los Angeles, USA.
† Davis School of Gerontology and Department of Sociology, University of Southern California, Los Angeles, USA.

one-quarter of the Chinese rural population (Goodkind and West 2002). At the same time, the Chinese population is ageing rapidly both absolutely and relatively. The share of the population aged 65 or more years will increase from seven per cent in 2000 to about 20 per cent in 2040 (United Nations Organisation 2005), and it is projected that by 2050, 31 per cent of the Chinese, or 437 million people, will be older people, twice the number of children (Zhang 2007). Given that more than 64 per cent of the Chinese live in rural areas and that many young people move to cities, population ageing is most marked in the country areas (National Statistics Bureaus of China 2001).

Together, the two trends exacerbate the age-structure imbalances of China's rural areas. It is estimated that the number of rural older people with migrant children reached over 18 million in 2000 (Du *et al.* 2004). As families, especially adult children, play a crucial role in providing various forms of support for Chinese older people (Chi and Chou 2001; Whyte 2003; Xu 2001), the exodus of the young (especially young men) from rural areas has led to growing concern over the support and well-being of older people left behind (Silverstein, Cong and Li 2006). The geographical separation of adult children and elderly parents is a structural barrier and impedes close inter-generational exchange (King and Vullnetari 2006; Mallee 2000; Wilson 2002). Older parents left behind may also experience reduced psychological wellbeing through feelings of loneliness and abandonment in the absence of children (Du *et al.* 2004). In addition, since pension systems have not yet been extended to rural areas and support from local government is not available for most older people in rural China (Xu 2001), the combination of out-migration and ageing also exerts pressures on the health care and social insurance systems.

Despite the growing concerns over the support and wellbeing of older people in rural areas, recent studies from China and other Asian countries suggest that the negative impact of the massive out-migration on older adults may have been overstated. For instance, some research has found that with the recent rapid economic and social changes, family roles and the commitment among most young adults to provide old-age support for their parents endure (Bongaarts and Zimmer 2002; Keasberry 2001; Knodel *et al.* 2000; Lin 2002; Zimmer and Kim 2002; Zimmer and Kwong 2003). The consistency of inter-generational support through such social changes varies by type of support (*e.g.* economic or instrumental support) (Lin 2002). In terms of the psychological wellbeing of older parents left behind, some researchers suggest that the increasing involvement of the remaining parents in farm work, household chores and grandparenting, in the absence of their migrant children, may provide older people with continuing status and roles, and thus enhance rather than

impair their wellbeing (Becker *et al.* 2003; Chen and Silverstein 2000). To understand more fully this issue, this study investigated how the out-migration of adult children affected over two years the monetary, instrumental and emotional forms of inter-generational support among rural Chinese older people, and also their psychological wellbeing, specifically depression and life satisfaction.

Out-migration and elderly parents in rural areas: empirical findings

Although family spatial separation and its implications for older adults have been investigated since the 1960s (*e.g.* Greenwell and Bengston 1997; Litwak 1960; Smith 1998), most research has been in western countries (Hank 2005; Lin and Rogerson 1995; Rogerson, Weng and Lin 1993). Only in the last decade have studies begun on the relationship between out-migration of adult children and the wellbeing of remaining parents in developing countries. One of the most direct and profound consequences of out-migration is the change in family structure and *living arrangements*. The large-scale out-migration of young adults is believed to reduce average household size in labour-sending areas (Barker 1994; Wang and Li 2005). In China, a relatively high proportion of the rural elderly are found to live alone or in 'empty-nest' and 'skip-generation' households due to large-scale out-migration (Du *et al.* 2004). Because household size and living arrangements are key variables in family support (Keasberry 2001; King and Vullnetari 2006; Wolff and Dimova 2006), such a change challenges the traditional role of the family in elderly care. Studies in China show that since community services are underdeveloped in many rural areas, the needs of elderly parents without nearby children are often under-served, putting them at a risk of declining health (Chen and Silverstein 2000; Silverstein, Cong and Li 2006).

A general theoretical proposition is that out-migration results in diminished informal support resources among the elderly parents who remain. 'Modernisation and ageing theory' also points to a relationship between urbanisation with industrialisation and decreased old-age care, partly as a result of the increased geographical distance between family members, and partly because of a decline in family orientation (Aboderin 2004; Cowgill and Holmes 1972; Kuhn 2005). These propositions focus on one particular aspect of inter-generational support, namely hands-on support or personal care of older parents. Other types of support, such as monetary and emotional transfers, may be affected differently by social changes in general and by out-migration in particular, but are rarely distinguished in these theories. In addition, they tend to overlook the diversity

of local conditions and their relation to family forms and support patterns. As Asian cultures emphasise the collective family and filial obligation, the forces of modernisation, urbanisation and population mobility may not erode support as severely as expected. As seen in the following review of studies in developing countries, a more nuanced picture is emerging of the changes in inter-generational support following out-migration.

The out-migration of adult children changes both the type and extent of family support available to the remaining parents. It could significantly reduce *instrumental support* (*i.e.* hands-on support with personal care and housework) (Du *et al.* 2004), but it has been found that the lack of instrumental support is not related to the psychological wellbeing of the older parents left behind (Silverstein, Cong and Li 2006). In other words, even with less instrumental support, parents with migrant children can maintain good psychological states. Numerous studies of *financial support* received by rural elders consistently have reported that most migrant children compensate for their separation from parents by regularly sending back remittances (Du *et al.* 2004; Keasberry 2001; Zhang and Wu 2003). Factors such as the number of children, children's income, parents' socio-economic status and agriculture-based self-sufficiency associate with the financial support received by the parents who remain (Kreager 2006; Zhang and Wu 2003). Except for a study in rural Albania (King and Vullnetari 2006), where elderly parents reported an enhanced sense of economic *insecurity* following the out-migration of their children, migrant children's remittances are believed to transform positively the lives of families and to enhance the material wellbeing of elderly parents (Du *et al.* 2004; Huang 1997; Knodel and Saengtienchai 2005; Zhang and Wu 2003). The positive impact of remittances may outweigh any negative influence of out-migration on the parents' psychological wellbeing (Wolff and Dimova 2006). For instance, it has been found in rural China that the value of the financial transfers received from children is inversely related to depressive symptoms among older people (Silverstein, Cong and Li 2006).

Several qualitative studies have revealed that the *emotional support* provided by migrant children to parents is more in evidence than day-to-day hands-on care. Although far away, most migrant children still provide long-distance emotional support and actively participate in care-giving for their parents (Baldock 2000; Kuhn 1999). In Asian countries particularly, it is reported that extended family relations are maintained over great geographical distances and that most migrant children maintain a commitment to filial piety and to parental wellbeing (Knodel *et al.* 2000; Knodel and Saengtienchai 2005). Thus, even if the spatial dispersion of a family reduces the children's hands-on support of older adults, emotional

ties and support are maintained. Taken together, the reported findings suggest that changes in inter-generational support after out-migration vary by type of support, and that the prevailing proposition of declining old-age support may not be warranted. Whereas instrumental support may be diminished by out-migration, monetary and emotional support from migrant children can persist or even be enhanced. As Kreager (2006) noted, the children's locations may not be a general proxy for support of elderly parents, and those who move away from their home are not necessarily lost to the support network. In addition, support from non-migrant children is neglected in most existing studies, and a holistic approach that sees the non-migrant children as an alternative support resource is rare. As the majority of elderly people in Asian countries still live close to at least some of their children and receive support from them (Beard and Kunharibowo 2001; Frankenberg, Chan and Ofstedal 2002; Keasberry 2001; Knodel and Debavalya 1997), the absence of one or two migrant children may not lead to a collapse of the parents' support network. The present study considered the support from both migrant and non-migrant children and sought a more comprehensive view of the implications of out-migration. Three forms of support that may be affected differently by out-migration were distinguished.

The psychological wellbeing of elderly parents left behind

Very few studies have investigated the direct effect of out-migration on the mental health of older parents. The existing literature generally points to the negative impact of children's out-migration on the parents' psychological wellbeing. Although monetary support from migrant children tends to have a positive impact on the psychological states of older parents (Silverstein, Cong and Li 2006), those left behind reported an increased sense of loss, loneliness, isolation, depression and abandonment in the absence of their children (Du *et al.* 2004; King and Vullnetari 2006; Miltiades 2002; Silverstein, Cong and Li 2006). The sense of loss and depression might be a result of unfulfilled expectations for closer or more frequent contacts with children (Miltiades 2002). The negative affect might be explained by the broken cultural norms and inter-generational solidarity between migrant children and older parents (Mjelde-Mossey, Chi and Lou 2006; Xu 2001). Most of the research to date has been cross-sectional. Without controlling for a parent's initial health, it is hard to tell whether the out-migration of children induces changes in parental wellbeing, or whether the children of elderly parents of certain health status are more likely to move away. In addition, most studies have been small and have relied on qualitative interviews to explore the subjective feelings

of parents. Very few attempts have been made to test quantitatively the hypothesised negative relationship between out-migration and parents' mental health. This study addressed the following specific research questions with particular reference to rural China:

Q1: Does the out-migration of adult children affect the monetary, instrumental and emotional support received by older parents, and how?
Q2: Does the out-migration of adult children affect their parents' psychological wellbeing as measured by depression and life satisfaction, and how?
Q3: After controlling for variations in the three forms of intergenerational support, does the out-migration of adult children affect their parents' psychological wellbeing as measured by depression and life satisfaction, and how?

Design and methods

The sample and measures

The data derived from the 2001 and 2003 waves of a longitudinal study 'The wellbeing of older people in Anhui Province' that was conducted jointly by the Schools of Gerontology and Social Work at the University of Southern California and the Population Research Institute of Xi'an Jiaotong University, China. Older adults aged 60 or more years in the rural region of Chaohu, Anhui Province, China, were randomly selected to explore how a series of social changes including rural-to-urban migration affect Chinese rural elders. The region was chosen for the relatively high proportion of out-migration among working-age adults. In 2001, the Wave 1 stratified multi-stage sampling selected 1,802 potential respondents from the administrative records of 72 randomly selected villages in six rural townships in Chaohu. Of this number, 1,696 completed the survey, giving a response rate of 94.1 per cent. In 2003, Wave 2 follow-up interviews were carried out with 1,391 individuals, 82 per cent of the original participants. After excluding cases with missing values on the migration status of children, the final analysis sample was 1,237.

For the *dependent variables*, psychological wellbeing was operationalised as life satisfaction and depression. The life-satisfaction scale was adapted from Diener *et al.* (1985) and has seven items that ask respondents whether they agree or disagree with statements that indicate content and discontent with their current lives ('better life than most', 'satisfied with life', 'interesting life', 'best years of life', 'life meets expectations', 'life is

tedious' and 'life is tiring'). After coding the items in the same direction, we summed the seven scores, producing a measure that ranged from zero to seven, with higher scores reflecting higher levels of life satisfaction. The scale has been used extensively and proven reliable in large cross-cultural analyses of life satisfaction (Goodwin, Cook and Yung 2001; Pavot and Diener 1993). It has demonstrated validity in the Chinese population (Goodwin, Cook and Yung 2001; Leung and Leung 1992; Shek 2002). The Cronbach's alpha scores for the Chinese version of the scale were 0.79 and 0.84 in 2001 and 2003, respectively.

We measured depression with nine questions from the Center for Epidemiologic Studies–Depression (CES-D) scale (Radloff 1997). Among the nine items, three indicated feelings of positive affect (happiness, enjoyment, pleasantness), two indicated feelings of negative affect (lonely, upset), two indicated feelings of marginalisation (useless, nothing to do), and two indicated somatic symptoms (poor appetite, has trouble sleeping). The respondents rated the frequency with which each symptom had been experienced during the past week ('0' = rarely or none of the time, '1' = some of the time, '2' = most of the time). After coding the items in the same direction, we summed the nine scores, resulting in a depression scale ranging from 0 to 18, with a higher score indicating greater depression. The CES-D scale has been used widely among the Chinese in mainland China, Hong Kong and the United States, and has been confirmed as reliable and valid cross-culturally (Cheung, Liu and Yip 2007; Mui, Burnette and Chen 2001; Zhang and Norvilitis 2002). The short form CES-D also has satisfactory content and temporal reliability among Chinese older adults (Boey 1999; Cheng and Chan 2005). In the present study, the Cronbach's alpha scores for this Chinese version of the scale were 0.77 and 0.80 in 2001 and 2003, respectively.

Turning to the *independent variables*, two represented the presence of out-migrant children. A dummy variable indicated whether a respondent had *any* migrant children (1) or none (0). The second variable is a count of the number of the respondent's children who were migrants. Migrant children were defined as those who lived in different counties or cities from their parents (Goodkind and West 2002). We measured *inter-generational support* with three variables: (a) monetary support, (b) instrumental support, and (c) emotional cohesion. The three scores considered support from both migrant and non-migrant children. Monetary support was indicated by the total amount (in *renminbi* or RMB) that the parent had received from all their children during the previous year (*n.b.* 100 RMB = US$12). Because the distribution of monetary support was highly skewed, we used the logarithm of the RMB amount (+1) to represent this varaible. We assessed *instrumental support* by the number of offspring from whom the older parent

had received hands-on help in either household tasks (*e.g.* cleaning the house, washing clothes and dishes) or personal care tasks (*e.g.* bathing and dressing) during the previous 12 months. Offspring referred to son(s), daughter(s), son(s)-in-law and daughter(s)-in-law.

We measured *emotional cohesion* by three questions that assessed the quality of each parent–child relationship that was adapted from the 'Intergenerational Solidarity Inventory' (*see* Mangen, Bengtson and Landry 1992). The three questions were: (a) 'Taking everything into consideration, how close do you feel to (this child)?', (b) 'How much do you feel that (this child) would be willing to listen when you need to talk about your worries and problems?', and (c) 'Overall, how well do you and (this child) get along together?' For each question, the score ranged from 0 to 2 ('0' = not at all close not at all/not at all well, '1' = somewhat close/somewhat/somewhat well, '2' = very close/very much/very well). The additive score for each child ranged from 0 to 6. We took the average score across all children for each parent. The Cronbach's alpha reliability scores for this scale were 0.94 and 0.95 for the two waves.

The *control variables* were the socio-demographic characteristics of the older adults (age, gender, marital status, education attainment, income, living arrangement, total number of children and functional health difficulties). Age was measured in years, and gender, marital status and education attainment were coded as dummy variables (female = '1', married persons = '1'; received some education = '1'). Income was indicated by the total income that the respondent (and spouse, if married) had received from work or a pension during the previous year. Because the distribution of income was highly skewed, we used the logarithm of the RMB amount (+1) to represent the income. As the focus of this study was support from children, we coded living arrangement as a categorical variable ('0' = living alone (reference group), '1' = living with offspring (including children, grandchildren, son(s)-in-law and daughter(s)-in-law), '2' = living with others, *i.e.* spouses, parents, siblings or other relatives). A dummy variable captured the change in living arrangement over time ('1' = those who started to live alone between 2001 and 2003, '0' = others).

Health status was represented by functional health difficulties. The respondents indicated their level of difficulty ('0' = none, '1' = some, '2' = cannot do it without help) in performing 15 tasks that represented the activities of daily living (dressing or undressing, bathing, walking around the room, getting out of bed, standing up from a chair, going to the toilet, and eating); in performing the instrumental activities of daily living (preparing meals, shopping, doing housework, taking the bus or train, managing money); and in doing activities requiring physical strength, mobility and flexibility (lifting a 10 kilogram bag of rice; climbing one flight of stairs;

walking 100 metres; and stooping, crouching or kneeling). The summed functional health difficulty scores ranged from 0 (no difficulties performing any task) to 30 (unable to perform any task). The Cronbach's alpha reliability scores for this scale were 0.95 in both 2001 and 2003. We subtracted the functional health difficulty score in 2001 from that in 2003 to determine the change in functional status over time. All the key variables (*i.e.* psychological wellbeing, the out-migration of children, inter-generational support, and control variables) were repeated measures at both waves. We used the information of out-migration at Wave 1 to predict the psychological outcomes at Wave 2, while controlling for the baseline socio-demographic variables, inter-generational support and psychological wellbeing. The change in living arrangement and functional health over time were also included in the analysis.

Statistical methods

Descriptive statistics were used to profile the baseline sample, and independent *t*-tests to examine the differences between the respondents with and without migrant children at Wave 1, their received inter-generational support and psychological wellbeing at Wave 2, and the change in support and wellbeing over the two years. We further carried out two multiple regression analyses to predict both depression and life satisfaction of parents at Wave 2. For both outcome measures, Model 1 had depression (or life satisfaction) at Wave 1, the socio-demographic variables and inter-generational support at Wave 1, and the changes in living arrangements and functional health between the two waves, while Model 2 added the number of migrant children at Wave 1. Controlling for baseline inter-generational support and psychological wellbeing helped obviate self-selection problems by discounting the possibility that the initial support and psychological wellbeing of older adults induced the out-migration of children. The two-stage regressions enabled us to evaluate the unique contribution of the out-migration of children on parental wellbeing over two years, while the effects of the socio-demographic characteristics of the parents, baseline inter-generational support, and the change in living arrangement and functional health over time were specified.

Results

Table 1 profiles the older adults at the baseline. The mean age of the analysis sample was 70 years (standard deviation (s.d.) = 6.9), and the majority were female (52 %) and married (61 %). The average respondent

TABLE 1. *Socio-demographic profile of the sample in 2001*

Variables	Mean	s.d.
Socio-demographic:		
Age	69.8	6.9
Female (%)	52.1	–
Married (%)	60.9	–
Functional health difficulties	4.7	6.2
Income (log + 1)	3.8	3.6
Living arrangement:		
Living alone (%)	18.7	–
Living with offspring (%)	51.4	–
Living with other relatives (%)	29.9	–
Total number of children	4.1	1.6
Having migrant children (%)	67.7	–
Total number of migrant children	1.4	1.4
Inter-generational support from children:		
Total monetary support (log + 1)	6.3	1.5
Number of children who provided instrumental support	1.1	1.4
Average emotional support	4.2	1.3
Psychological wellbeing:		
Depression	6.2	4.0
Life satisfaction	4.3	2.1
Sample size	1,237	

Note: s.d.: standard deviation.

had four adult children, of whom about one-third (1.4) were migrants. Around one-half (51 %) of the respondents lived with their offspring, and 19 per cent lived by themselves. The sample characteristics are comparable to the national population in terms of the mean age, gender ratio, marital status and average household size (National Statistics Bureaus of China 2001), but a larger proportion of the respondents lived alone and a smaller proportion lived with children (Zeng and Wang 2003). These differentials are consistent with the large-scale out-migration of adult children. The average functional health difficulty score for the respondents was 4.7 out of a possible 30 (s.d. = 6.2). On average, each participant had received instrumental support from one child, and received 1,061 RMB (approximately US$135) from all children during the previous 12 months. The respondents reported a relatively high mean score for emotional cohesion with children (4.2 of a possible 6, s.d. = 1.2). The average depression and life-satisfaction scores at the baseline were 6.2 (s.d. = 4.0) and 4.3 (s.d. = 2.1), respectively.

To address the first two research questions, we conducted a series of independent *t*-tests to examine whether older adults with and without migrant children in 2001 differed in their received support and

TABLE 2. *Inter-generational support and psychological wellbeing of older rural Chinese parents with and without migrant children in 2001*

	Older adults with migrant children in 2001		Older adults without migrant children in 2001		
Variables	Mean	s.d.	Mean	s.d.	*t*
Support and psychological wellbeing in 2003:					
Monetary support	6.83	1.06	6.41	1.10	6.48***
Instrumental support	0.73	1.26	1.09	1.52	−4.08***
Emotional support	4.38	1.20	4.48	1.28	−1.23
Depression	6.05	4.02	6.58	4.12	−2.15*
Life satisfaction	4.58	2.31	4.45	2.33	0.93
Change in support and psychological wellbeing, 2001–3:					
Monetary support	0.33	1.35	0.69	1.60	−3.89***
Instrumental support	−0.16	1.65	−0.30	2.05	1.18
Emotional support	0.17	1.44	0.24	1.49	−0.77
Depression	0.10	4.48	−0.28	4.64	1.37
Life satisfaction	0.18	2.46	0.35	2.58	−1.10
Sample size	837		400		

Note: s.d.: standard deviation.
Significance levels: (1,235 degrees of freedom) * $p<0.05$, *** $p<0.001$.

psychological wellbeing in 2003, and whether there had been a difference in the change in support and psychological wellbeing between 2001 and 2003 (Table 2). The results show that those who had migrant children at Wave 1 received significantly more monetary support, and less instrumental support by 2003, and they had a significantly lower level of depression. The two groups did not differ in mean emotional cohesion with their children or life satisfaction at follow-up. These initial results suggested that older parents with migrant children in 2001 were advantaged in terms of monetary support and psychological outcomes in 2003. When the changes in support and psychological wellbeing over time are compared (the lower panel of the Table 2), however, it was found that having migrant children at baseline associated with less increase in monetary support. The two groups were no different for change in psychological wellbeing.

Taken altogether, the bivariate comparisons revealed that older parents with migrant children in 2001 were less depressed at baseline than those without migrant children, which explained why the former group had a significantly lower level of depression at Wave 2, but not the change in depression over time. Turning to the lower increase over two years in monetary support among parents with migrant children, an unexpected

TABLE 3. *Unstandardised regression coefficients predicating the depression of older rural Chinese adults in 2003*

Variable or measure	Model 1		Model 2	
	β	SE	β	SE
Depression at Wave 1	0.19***	0.03	0.19***	0.03
Socio-demographic variables at Wave 1:				
Age	−0.01	0.02	−0.01	0.02
Female	0.36	0.23	0.39	0.23
Married	0.20	0.30	0.20	0.30
Education	−0.08	0.26	−0.06	0.26
Income (log + 1)	−0.11**	0.04	−0.12**	0.04
Total number of children	−0.08	0.07	−0.14	0.07
Living with offspring at Wave 1[1]	−0.44	0.31	−0.47*	0.31
Living with others at Wave 1[1]	−0.41	0.38	−0.36	0.38
Functional health difficulties at Wave 1	0.22***	0.02	0.22***	0.02
Started to live alone (Wave 1–Wave 2)	1.41***	0.39	1.43***	0.39
Change in functional health difficulties (Wave 1–Wave 2)	0.24***	0.02	0.24***	0.02
Inter-generational support at Wave 1:				
Monetary support	0.01	0.08	−0.02	0.08
Instrumental support	−0.14*	0.07	−0.11	0.07
Emotional cohesion	−0.29**	0.08	−0.29**	0.09
Total number of migrant children at Wave 1			0.20*	0.09
R^2	0.32		0.33	
Sample size	1,237		1,237	

Notes: 1. Reference category is living alone. 2. With 1, 1,171 degrees of freedom. SE: standard error. *Significance levels*: (1,235 degrees of freedom) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

result, it turns out that those with migrant children at baseline received significantly more monetary support at that time than those having no migrant children.[1] This suggests that older parents with more monetary support at baseline were more likely to have children that had migrated, but it is possible that one or more children migrated long before the Wave 1 survey, thus even if out-migrations were associated with a significant increase in monetary support, the magnitude of the change over two years may not have been great.

To disentangle the relationships between out-migration, inter-generational support and the parents' psychological wellbeing, two-step multiple regressions were estimated. The dependent variables were the parents' depression and life-satisfaction scores at Wave 2, the independent variable was out-migration intensity at Wave 1 (measured by the number of the parent's children that were migrants), and the control variables were baseline depression or life satisfaction and inter-generational support. The results are shown in Table 3. Beginning with the regressions of depression,

Model 1 revealed that older parents with higher income were healthier and less depressive at baseline and had a lower level of depression at follow-up. Starting to live alone and experiencing more functional health difficulties over time also associated with more depressive symptoms at follow-up. Receiving less instrumental and emotional support from children at baseline predicted a significant increase in the parents' depression at follow-up. Model 2 added the number of migrant children that a parent had at baseline, which significantly increased the association with the parents' depression at follow-up (ΔF (degrees of freedom 1, 1,171) = 5.71, $p < 0.05$). In other words, when controlling for the baseline socio-demographic variables and inter-generational support, there was a positive relationship between the number of children who had migrated and the parents' depression. Although the bivariate results suggested that older parents with migrant children at baseline had relatively fewer depressive symptoms at follow-up, the multivariate regressions suggest that inter-generational support buffers the negative impact of out-migration. When the effect of the inter-generational support was discounted, the out-migration of children led to more depressive symptoms among older parents.

Similar two-step regressions to predict the life satisfaction of parents at follow-up were estimated. The results are shown in Table 4. Model 1 indicates that having more children, living with offspring, and having higher life satisfaction at baseline predicted the parents' sense of life satisfaction at follow-up. Having fewer functional health difficulties at baseline and relatively little decline in functional health over two years also associated significantly with higher life satisfaction at Wave 2. Unlike the model for depression (for which instrumental support from children at baseline was also protective), only a high level of baseline emotional cohesion with children enhanced the parents' life satisfaction at follow-up. As before, Model 2 added the number of migrant children at baseline. This variable was negatively related to the parents' life satisfaction at Wave 2, but with only marginal significance ($p = 0.06$).

Discussion

Large-scale internal migration in many developing countries presents a special challenge for the support of the rising number of older people in rural areas. While a few recent papers have investigated the consequences of out-migration on the family support and health of the older parents left behind, very little is known about the implications for their psychological wellbeing. Most previous findings have been limited by cross-sectional

TABLE 4. *Unstandardised regression coefficients predicating the life satisfaction of older rural Chinese adults in 2003*

	Model 1		Model 2	
Variable or measure	β	SE	β	SE
Depression at Wave 1	0.27***	0.03	0.27***	0.03
Socio-demographic variables at Wave 1:				
Age	0.01	0.01	0.01	0.01
Female	−0.08	0.14	−0.09	0.14
Married	−0.32	0.18	−0.32	0.18
Education	−0.18	0.15	−0.19	0.15
Income (log+1)	0.02	0.02	0.02	0.02
Total number of children	0.09*	0.04	0.12**	0.04
Living with offspring at Wave 1[1]	0.44*	0.18	0.45*	0.18
Living with others at Wave 1[1]	0.36	0.23	0.34	0.23
Functional health difficulties at Wave 1	−0.10***	0.01	−0.10***	0.01
Started to live alone (Wave 1–Wave 2)	−0.43	0.23	−0.44	0.23
Change in functional health difficulties (Wave 1–Wave 2)	−0.12***	0.01	−0.12***	0.01
Inter-generational support at Wave 1:				
Monetary support	0.07	0.05	0.08	0.05
Instrumental support	0.06	0.04	0.04	0.04
Emotional cohesion	0.21***	0.05	−0.21***	0.05
Total number of migrant children at Wave 1			−0.09†	0.06
R^2	0.25		0.26	
Sample size	1,237		1,237	

Notes: 1. Reference category is living alone. 2. With 1, 1,171 degrees of freedom. SE: standard error.
Significance levels: † $p<0.1$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

designs, which cannot directly test the causal relationship between out-migration and parental wellbeing. This study has examined the associations between the out-migration of adult children, inter-generational support and the psychological wellbeing of older people in rural China. We have investigated how the out-migration of adult children affected the monetary, instrumental and emotional support received by the parents, and their depression and life satisfaction. Consistent with previous findings (Du *et al.* 2004; Keasberry 2001), it was found by the follow-up survey that, compared to those who had all their children living nearby, older adults with migrant children received significantly more monetary support but less instrumental support. The higher monetary support may be largely attributed to remittances from migrant children. These money transfers can be regarded as the migrant children's compensation to their parents for their inability to provide direct personal care. Even so, the evidence that out-migration associated with increased monetary support and reduced instrumental support needs to be interpreted with caution. It was

also noted that parents with migrant children already had more monetary support and less instrumental support when the children migrated, although it is possible that the differences at baseline arose because out-migrations occurred before the baseline survey. It is also possible that older adults at baseline who had more monetary support and were healthier (and so received less instrumental support) were more likely to have children who migrated. The data did not enable us to evaluate the competing explanations, but nevertheless it is clear that older parents with migrant children enjoyed more monetary support and received less instrumental support from their children.

In this study, the elderly parents with migrant children at baseline reported at follow-up a mean score for emotional cohesion with their children that was similar to the score for those without migrant children. This implies that the family relations can be maintained over great geographical distances. Although family spatial dispersion may negatively affect the hands-on support for the parents left behind, emotional ties and social exchange can be maintained between older parents and migrant children. This finding suggests that Chinese migrant children remain actively involved in care-giving for their older parents even when they move away, but again there are other possible explanations. While emotional cohesion between migrant children and their parents may decline in the absence of children, the increased monetary support for parents may buffer the effect. It should be noted that the measure used was of the *average* emotional closeness between the parents and all their children, which might obscure a differential in the closeness to migrant and non-migrant children.

We also tested how the out-migration affected the psychological well-being of the older parents left behind. Contrary to previous qualitative findings (*e.g.* Du 2000; Du *et al.* 2004; King and Vullnetari 2006; Miltiades 2002; Murphy 2004), it was found that when compared to those without migrant children, older parents with migrant children had a significantly lower level of depression after two years. Further examination revealed, however, that parents with migrant children had less depressive symptoms at baseline. The multiple regression analyses confirmed that when the positive effect of inter-generational support was taken into account, those with more migrant children tended to have a significantly higher level of depression and a lower level of life satisfaction. In other words, given no continued inter-generational support, out-migration impaired the psychological wellbeing of the parents.

Several of the findings deserve more investigation. Firstly, one interpretation of the results is that out-migration is a self-selection process from the parents' side. It was found at both baseline and follow-up that older parents with migrant children had more monetary support and better

health conditions than those without migrant children, which suggests that healthier and more resource-rich older parents were more likely to have migrant children, or to enable them to move out. This finding demonstrates the importance of controlling for the initial status of older parents when examining the impact of out-migration. As has been shown, the evidence from bivariate and multivariate tests of change over time can be very different. Secondly, the findings point to the important role of continuous inter-generational support in maintaining the psychological wellbeing of the older parents who remain behind. Inter-generational support may moderate the effect of out-migrations on parental wellbeing. The results have shown that although the out-migration of children directly impairs the psychological wellbeing of the parents, such a negative influence can be buffered by increased monetary support for the parents and by continuing emotional cohesion between the generations. The lack of a difference in the change in psychological wellbeing between the parents with and without migrant children may be through the continued inter-generational support whether from migrant or non-migrant children. Thirdly, and of considerable interest, this study has found that the negative influence of out-migration on the psychological wellbeing of older parents was not as significant as expected. For one thing, adding the out-migration term in Model 2 did not significantly augment the explained variance in psychological wellbeing, nor did it greatly change the regression coefficients of the already-entered predictors. In other words, the out-migration of adult children did not significantly disturb the relationships between the other predictors of psychological wellbeing.

In this study, the measures of support were based on the information about all the children of their parents. This may partly explain the non-significant change over time in the three forms of support for parents. Many previous studies have focused only on migrant children, but the present findings indicate that the attributes and behaviour of both migrant and non-migrant children need to be considered. The presence of non-migrant children and the support provided by them may buffer the negative impact of their siblings' migrations on elderly parents. This may particularly apply in Asian countries where the majority of elderly people still live close to at least some of their children (Beard and Kunharibowo 2001; Frankenberg, Chan and Ofstedal 2002; Keasberry 2001; Knodel and Debavalya 1997; Silverstein, Cong and Li 2006). In our sample, around 50 per cent of the respondents lived with at least one offspring.

Some limitations of the findings should be noted. Firstly, older adults in this study were treated as a homogeneous group. It is possible that older parents with certain attributes (*e.g.* gender, marital status, health conditions and socio-economic status) might be more vulnerable when facing

the changes subsequent to children's out-migration. The explanations given by this study thus need to be interpreted with caution. In addition, several attributes of migrant children – gender, duration of migration and distance from parents – may also affect the inter-generational relationship and the psychological outcomes for the parents. These factors deserve further investigation.

Despite this limitation, this study has provided valuable insights into the complex relationships between children's out-migration, changing inter-generational support patterns, and their implications for the psychological wellbeing of older parents. It has also demonstrated the importance of a longitudinal design and of considering baseline support and health outcomes when studying the impacts of out-migration on the parents left behind. Given the growing magnitude of rural-to-urban migration in many developing countries, the care and wellbeing of the older parents left behind will continue to be the issues of great importance. In China particularly, one may expect more rural elders to be living with fewer children in the future, as a consequence of the one-child fertility policy and of changing family structures in the face of the country's dramatic social changes. If that is the case, even a low intensity of adult children's out-migration may create significant pressures on old-age support. More concerted effort is required to deepen our understanding of the longitudinal effects of out-migration on various aspects of the ageing experience, particularly in the rural population.

Acknowledgements

This research was supported by grants from the Fogarty International Center of the National Institutes of Health (R03TW01060-01) and the USC US-China Institute. The authors would like to thank Shuzhuo Li for his leadership as the Co-director of the larger research project on Chinese rural elders, and Zhen Cong for her contribution to data collection.

NOTE

1 The standardised mean scores for monetary support in 2001 were: for those with migrant children, 6.5 (s.d. = 1.4) and for those without, 5.7 (s.d. 1.6) (t (1,235 degrees of freedom) = 8.3, $p < 0.05$).

References

Aboderin, I. 2004. Modernisation and ageing theory revisited: current explanations of recent developing world and historical Western shifts in material family support for older people. *Ageing & Society*, **24**, 1, 29–50.

Baldock, C. V. 2000. Migrants and their parents: caregiving from a distance. *Journal of Family Issues*, **21**, 2, 205–24.
Barker, J. C. 1994. Home alone: the effects of out-migration on Niuean elders' living arrangement and social support. *Pacific Studies*, **17**, 3, 41–81.
Beard, V. A. and Kunharibowo, Y. 2001. Living arrangements and support relationships among elderly Indonesians: case studies from Java and Sumatra. *International Journal of Population Geography*, **7**, 1, 17–33.
Becker, G., Beyene, Y., Newsom, E. and Mayen, N. 2003. Creating continuity through mutual assistance: intergenerational reciprocity in four ethnic groups. *Journals of Gerontology: Social and Psychological Sciences*, **58B**, 3, 151–9.
Boey, K. W. 1999. Cross-validation of a short form of the CES-D in Chinese elderly. *International Journal of Geriatric Psychiatry*, **14**, 8, 608–17.
Bongaarts, J. and Zimmer, Z. 2002. Living arrangements of older adults in the developing world: an analysis of demographic and health survey household surveys. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, **57B**, 3, S145–57.
Cai, F. 2002. *Floating Population in China*. Henan People's Publishing House, Zheng Zhou, He Nan, China. [In Chinese.]
Chen, X. and Silverstein, M. 2000. Intergenerational social support and the psychological well-being of older parents in China. *Research on Aging*, **22**, 1, 43–65.
Cheng, S. T. and Chan, A. C. M. 2005. The Center for Epidemiologic Studies depression scale in older Chinese: thresholds for long and short forms. *International Journal of Geriatric Psychiatry*, **20**, 5, 465–70.
Cheung, Y. B., Liu, K. Y. and Yip, P. S. F. 2007. Performance of the CES-D and its short forms in screening suicidality and hopelessness in the community. *Suicide and Life-Threatening Behavior*, **37**, 1, 79–88.
Chi, I. and Chou, K. L. 2001. Social support and depression among elderly Chinese people in Hong Kong. *International Journal of Aging and Human Development*, **52**, 3, 231–52.
Cowgill, D. O. and Holmes, L. D. 1972. *Aging and Modernization*. Meredith, New York.
Diener, E., Emmons, R. A., Larsen, R. J. and Griffin, S. 1985. The satisfaction with life scale. *Journal of Personality Assessment*, **49**, 1, 71–5.
Du, P., Ding, Z., Li, Q. and Gui, J. 2004. The impact of out labor migration on the elderly stayers in rural areas. *Population Research*, **28**, 6, 44–52. [In Chinese.]
Du, Y. 2000. Rural labor migration in contemporary China. In West, L. A. and Zhao, Y. H. (eds), *Rural Labor Flows in China*. Institute of East Asia Study, University of California, Berkeley, California, 67–100.
Frankenberg, E., Chan, A. and Ofstedal, M. B. 2002. Stability and change in living arrangements in Indonesia, Singapore, and Taiwan, 1993–99. *Population Studies*, **56**, 2, 206–13.
Goodkind, D. and West, L. A. 2002. China's floating population: definitions, data and recent findings. *Urban Studies*, **39**, 12, 2237–50.
Goodwin, R., Cook, O. and Yung, Y. 2001. Loneliness and life satisfaction among three cultural groups. *Personal Relationships*, **8**, 2, 225–30.
Greenwell, L. and Bengston, V. L. 1997. Geographic distance and contact between middle-aged children and their parents: the effects of social class over 20 years. *Journals of Gerontology: Social Sciences*, **52B**, 1, S13–26.
Hank, K. 2005. *Spatial Proximity and Contacts Between Elderly Parents and Their Adult Children: A European Comparison*. Report 98-05, Research Institute for the Economics of Aging, University of Mannheim, Mannheim, Germany.
Huang, P. (ed.). 1997. *Searching for Survival: A Sociological Perspective of Rural-to-Urban Migration*. Yunnan People's Press, Kunmin, China. [In Chinese.]
Keasberry, I. N. 2001. Elder care and intergenerational relationships in rural Yogyakarta, Indonesia. *Ageing & Society*, **21**, 5, 641–63.

King, R. and Vullnetari, J. 2006. Orphan pensioners and migrating grandparents: the impact of mass migration on older people in rural Albania. *Ageing & Society*, **26**, 5, 783–816.

Knodel, J. and Debavalya, N. 1997. Living arrangements and support among the elderly in South-East Asia: an introduction. *Asia-Pacific Population Journal*, **12**, 4, 3–13.

Knodel, J., Friedman, J., Anh, T. S. and Cuong, B. T. 2000. Intergenerational exchanges in Vietnam: family size, sex composition, and the location of children. *Population Studies*, **54**, 1, 89–104.

Knodel, J. and Saengtienchai, C. 2005. *Rural Parents with Urban Children: Social and Economic Implications of Migration on the Rural Elderly in Thailand*. Report 05-574, Population Studies Center, University of Michigan, Ann Arbor, Michigan.

Kreager, P. 2006. Migration, social structure and old-age support networks: a comparison of three Indonesian communities. *Ageing & Society*, **26**, 1, 37–60.

Kuhn, R. 1999. *The Logic of Letting Go: Family and Individual Migration from Matlab, Bangladesh*. Graduate Group in Demography, University of Pennsylvania, Philadelphia, Pennsylvania. Available online at http://www.swadhinata.org.uk/misc/Khun-emigration%20from%20Bdesh.pdf [Accessed 2 February 2009].

Kuhn, R. 2005. A longitudinal analysis of health and mortality in a migrant-sending region of Bangladesh. In Jatrana, S., Toyota, M. and Yeoh, B. (eds), *Migration and Health in Asia*. Taylor & Francis, Quezon City, Philippines, 318–57.

Leung, J. P. and Leung, K. 1992. Life satisfaction, self-concept, and relationship with parents in adolescence. *Journal of Youth and Adolescence*, **21**, 6, 653–65.

Lin, G. 2002. Regional variation in family support for the elderly in China: a geo-developmental perspective. *Environment and Planning A*, **34**, 9, 1617–33.

Lin, G. and Rogerson, P. A. 1995. Elderly parents and the geographic availability of their adult children. *Research on Aging*, **17**, 3, 303–31.

Litwak, E. 1960. Geographic mobility and extended family cohesion. *American Sociological Review*, **25**, 3, 385–94.

Mallee, H. 2000. Agricultural labor and rural population mobility: some observations. In West, L. A. and Zhao, Y. H. (eds), *Rural Labor Flows in China*. Institute of East Asia Study, University of California, Berkeley, California, 34–66.

Mangen, D., Bengtson, V. L. and Landry, P. H. Jr (eds) 1992. *The Measurement of Inter-generational Relations*. Sage, Beverly Hills, California.

Miltiades, H. B. 2002. The social and psychological effect of an adult child's emigration on non-immigrant Asian Indian elderly parents. *Journal of Cross-Cultural Gerontology*, **17**, 1, 33–55.

Mjelde-Mossey, L. A., Chi, I. and Lou, V. W. Q. 2006. Relationship between adherence to tradition and depression in Chinese elders in China. *Aging and Mental Health*, **10**, 1, 1–8.

Mui, A., Burnette, D. and Chen, L. 2001. Cross-cultural assessment of geriatric depression: a review of the CES-D and GDS. *Journal of Mental Health and Aging*, **7**, 1, 137–64.

Murphy, R. 2004. The impact of labor migration on the well-being and agency of rural Chinese women: cultural and economic contexts and life course. In West, L. A. and Zhao, Y. H. (eds), *On the Move: Women and Rural-to-Urban Migration in Contemporary China*. Columbia University Press, New York, 243–76.

National Statistics Bureaus of China 2001. *China Statistical Yearbook: 2001*. China Statistics Press, Beijing.

National Statistics Bureaus of China 2006. *China Statistical Yearbook: 2006*. China Statistics Press, Beijing.

Pavot, W. and Diener, E. 1993. Review of the satisfaction with life scale. *Psychological Assessment*, **5**, 2, 164–72.

Radloff, L. 1997. The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, **1**, 3, 385–401.

Rogerson, P. A., Weng, R. H. and Lin, G. 1993. The spatial separation of parents and their adult children. *Annals of the Association of American Geographers*, **83**, 4, 656–71.
Shek, D. T. L. 2002. The relation of parental qualities to psychological well-being, school adjustment, and problem behavior in Chinese adolescents with economic disadvantage. *American Journal of Family Therapy*, **30**, 3, 215–23.
Silverstein, M., Cong, Z. and Li, S. 2006. Intergenerational transfer and living arrangements of older people in rural China: consequences for psychological well-being. *Journal of Gerontology, Social Sciences*, **61B**, 5, S256–66.
Smith, G. C. 1998. Residential separation and patterns of interaction between elderly parents and their adult children. *Progress in Human Geography*, **22**, 3, 368–84.
United Nations Organisation 2005. *World Population Prospects, the 2004 Revision: Population Database*. Department of Economic and Social Affairs, Population Division, United Nations Organisation, New York.
Wang, H. and Li, B. 2005. Family support for the elderly in rural China: the internal migration. *Heihe Journal*, **118**, 4, 120–2. [In Chinese.]
Whyte, M. K. (ed.) 2003. *China's Revolutions and Intergenerational Relations*. Center for Chinese Studies, University of Michigan, Ann Arbor, Michigan.
Wilson, G. 2002. Globalisation and older people: effects of markets and migration. *Ageing & Society*, **22**, 5, 647–63.
Wolff, F. C. and Dimova, R. 2006. How do migrants care for their elderly parents? Time, money, and location. *Swiss Journal of Economics and Statistics*, **142**, special issue (March), 123–30.
Xu, Y. 2001. Family support for old people in rural China. *Social Policy and Administration*, **35**, 3, 307–20.
Zeng, Y. and Wang, Z. L. 2003. Dynamics of family and elderly living arrangements in China: new lessons learned from the 2000 census. *China Review*, **3**, 2, 95–119.
Zhang, J. and Norvilitis, J. M. 2002. Measuring Chinese psychological well-being with Western developed instruments. *Journal of Personality Assessment*, **79**, 3, 492–511.
Zhang, X. and Wu, Z. 2003. Impacts of rural laborers' employment in urban areas on the economic supports to the rural old: a case study in Shuanggang town. *South China Population*, **18**, 70, 30–5. [In Chinese.]
Zhang, Z. 2007. Preparing for our golden years. *Beijing Review*, 8 January. Available online at www.bjreview.com/print/txt/2007-01/08/content_52461.htm [Accessed 2 February 2009].
Zimmer, Z. and Kim, K. S. 2002. The elderly of Cambodia: socio-demographic conditions, living arrangements, and the implications for intergenerational relations. Paper presented at the Annual Meeting of the Population Association of America, 11 May, Atlanta, Georgia.
Zimmer, Z. and Kwong, J. 2003. Family size and support of older adults in urban and rural China: current effects and future implications. *Demography*, **40**, 1, 23–44.

Accepted 3 February 2009

Address for correspondence:
Man Guo, School of Social Work, University of Southern California, 669 W. 34th Street, Los Angeles, CA 90089-0411, USA.

E-mail: mguo@usc.edu