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Rural place attachment and urban community integration of Chinese older adults in rural-to-urban relocation

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Abstract

With China's rapid urbanisation, many residents, especially older adults, are suffering from psychological problems induced by rural-to-urban relocation. This study examines the association between older adults' rural place attachment and their depression after relocation, as well as the protective roles of neighbourhood social cohesion and sense of community in the relocation place. Chinese older adults (N = 224) who relocated from rural villages to urban communities completed a survey for this study. The results showed that older adults with stronger rural place attachment experienced more depressive symptoms and a lesser sense of community in the relocation place. In addition, the association between rural place attachment and depression was weakened by neighbourhood social cohesion. That is, compared with older adults perceiving low neighbourhood social cohesion, the positive association between rural place attachment and depression was weaker for older adults perceiving high neighbourhood social cohesion. Furthermore, neighbourhood social cohesion's protective role depended on sense of community. In particular, neighbourhood social cohesion buffered the association between rural place attachment and depression for older adults with a strong sense of community but not for older adults with a weak sense of community. These results have implications for developing resources within neighbourhoods and communities to promote relocation adjustment for older adults.

Keywords: place attachment; neighbourhood social cohesion; sense of community; depression; relocation; older adults

Introduction

With China's rapid urbanisation, an increasing amount of rural land is being occupied by urban construction, and rural residents are being forced to leave their homes and relocate to residential communities in urban areas (Huang *et al.*, 2017; Zhang, 2019). Separation from one's home, especially through involuntary relocation, might increase one's risk of distress (Scannell and Gifford, 2017).

Compared to younger adults, older adults are more vulnerable to the negative impacts of relocation because place becomes more significant to people as they age (Wu *et al.*, 2016). Older adults' strong attachment to a rural place might impede their adjustment to an urban community. The purpose of this study was to investigate the association between Chinese older adults' rural place attachment (RPA) and their depression after relocating, as well as the protective roles of neighbourhood social cohesion (NSC) and sense of community (SOC) in the relocation place.

Theoretical background

Rural-to-urban relocation in China

With China's rapid urbanisation and economic development, many people have moved from rural to urban areas (Yan *et al.*, 2016). The Chinese government expects to integrate 70 per cent of the country's population into cities by 2025 (Yan *et al.*, 2016). Two types of rural-to-urban movements are currently happening in China. One is active movement, whose major participants are working-aged young adults. They move from rural to urban areas in pursuit of employment opportunities and better living conditions. The other type of movement is involuntary relocation, which is caused by government-led relocation policies that support infrastructure construction projects and address concerns about poverty, disaster, and so on (Wu *et al.*, 2016). The government takes possession of farmers' land and houses for commercial building or communal facility construction and rebuilds urban apartments for these farmers to live in at a low price or rent-free (Li *et al.*, 2019). Because the farmers can no longer rely on planting to make a living, they change their rural *hukou* to an urban *hukou*; thus, they can receive social welfare of about 1,000 RMB each month for living in urban areas (Zhang, 2019). This kind of rural-to-urban relocation is an increasingly widespread phenomenon in contemporary China.

Rural-to-urban relocation may induce psychological adjustment problems for older adults through a lost sense of rural place and poor social integration into the urban place (Jiang *et al.*, 2018). Relocation disrupts the significance of a place in older people's lives, including their historical attachment, comfort with local amenities and social relationships (Gilroy, 2012). In traditional Chinese culture, a good life means settling down and not moving. The ageing-in-place literature emphasises that playing out life events in one place and being part of a community's social fabric may give older adults rootedness (Gilleard *et al.*, 2007). Failure to achieve ageing-in-place may result in physical and mental health problems (Singh *et al.*, 2018). In addition, an old Chinese adage says that good neighbours are more helpful than faraway relatives are, and relocation might disrupt older adults' place-based social networks and support systems, which are not easy to rebuild in a new place (Gilroy, 2012). In contrast to rural villages, urban living environments are less feasible for cultivating social interaction due to their gated apartments and lack of public space and co-operative affairs such as farm work. Furthermore, for many older adults, the relocation will be their first time moving from their rural ancestral villages into urban apartments (Wu *et al.*, 2016); thus, adapting to the urban lifestyle is not easy for them. Therefore,

despite the potentially bad physical conditions of their rural dwellings, older people prefer to remain in rural dwellings, which support their feelings of control and social integration (Gilroy, 2012). Given that the contemporary relocation programmes are influencing so many older adults living in China's rural villages, it is meaningful to understand how to promote older adults' psychological adjustment after relocation.

Place attachment theory

Place includes both a physical space and a collective consciousness of social connection and is often defined through historical continuity, cultural significance, opportunities for belonging and the provision of physical comfort (Gilleard *et al.*, 2007; Lewicka, 2011). As a common human experience, *place attachment* reflects the cognitive-emotional bonds between individuals and a place (Hidalgo and Hernández, 2001; Scannell and Gifford, 2017). Although places have a wide variety of types, such as homes, streets, cities and culturally significant sites, the majority of place attachment research has concentrated on neighbourhoods (Scannell and Gifford, 2017). Scannell and Gifford (2010) proposed the person–process–place framework of place attachment. The person dimension refers to the individual or collectively determined meanings of a place; the process dimension describes the cognitive, affective and behavioural content of the bonds between the individual and the place; and the place dimension emphasises a place's physical and social characteristics (Scannell and Gifford, 2010). Many previous studies have addressed the psychological and physical benefits of place attachment, such as promoting residents' wellbeing and sense of belonging (Scannell and Gifford, 2016, 2017).

Some previous studies have applied place attachment theory to relocation situations and reported the negative impacts of displacement, such as it inducing feelings of bereavement, emotional distress and physical health problems among relocatees (*e.g.* Kuwert *et al.*, 2009; Cao *et al.*, 2012; Le *et al.*, 2013). Compared to other age groups, older adults are more likely to suffer the negative consequences of relocation. People are encouraged to age in the same places they have always lived, which provides a sense of meaning, security, identity and social connection, thus facilitating older adults' wellbeing and health (Gilleard *et al.*, 2007; Wiles *et al.*, 2009, 2017). Previous studies found that relocation in later life increases risks of mortality and psychological distress (Gilleard *et al.*, 2007). The displaced older adults have substantially lower wellbeing and a higher prevalence of depressive symptoms than the lifelong residents (Kamo *et al.*, 2011; Chao, 2016). Older adults who experienced a forced displacement showed more anxiety and less resilience and life satisfaction than those who had not experienced a forced displacement (Kuwert *et al.*, 2009). In a study by Singh *et al.* (2018), internally displaced older adults experienced symptoms of distress, including depression, anxiety, feelings of abandonment, isolation and passivity, which were all linked with difficulties with integration as well as grief induced by displacement.

Some studies have specifically focused on Chinese relocation and provided insightful findings. For example, Huang *et al.* (2016) contrasted forced movers driven by demolition-led redevelopment programmes with voluntary movers and found that the forced movers were less likely than voluntary movers to participate

in public activities, have contact with new neighbours, and ask for help from the residents' committee and new neighbours. Li *et al.* (2019) established a conceptual model stressing the time sequence of events and their context to understand relocatees' experiences during urban redevelopment in China. The model conceptualised forced relocation as a process including a pre-demolition stage, a transitional stage and a post-relocation stage that affects the relocatees' experience, including social, economic, physical, psychological and behavioural dimensions (Li *et al.*, 2019). Wang *et al.* (2020) found that with China's urbanisation, residents in rural-to-urban fringes have a lower sense of place because of the dissolution of social bonding and the unsuccessful transition of their place identity during urbanisation. Wu *et al.* (2016) found that Chinese rural elders who experienced relocation driven by a government-organised relocation project perceived social support resources as being less available, as compared to what non-relocated individuals perceived. In Cao *et al.* (2012), relocatees driven by China's Three Gorges Dam Project had a higher level of depression than non-relocatees.

Research gap and framework in this study

Most of the previous studies took displacement as a dichotomous variable that distinguishes the displaced group from the non-displaced group and compared the groups' physical and psychological outcomes (*e.g.* Cao *et al.*, 2012; Le *et al.*, 2013; Jiang *et al.*, 2018). In addition, these studies supposed that all of the residents under a relocation programme experienced the same displacement but they did not measure each individual's perception of displacement. Although displacement is accompanied by a relocation process, it is too crude to use the terms *forced relocation* and *displacement* to describe what actually happens within restructuring processes as well as the effects on residents (Kearns and Mason, 2013). For example, some residents experience physical displacement but show little evidence of social and psychological displacement after relocation (Kearns and Mason, 2013). Change itself did not necessarily induce stress; whether changes are stressful depends on the psychological and social meanings of these changes (Cao *et al.*, 2012). Although relocation itself may act as a stressor because it often consists of 'grieving for a lost home' and 'anxiety about an uncertain future', some relocatees showed a favourable picture, such as satisfaction and happiness after resettlement (Cao *et al.*, 2012). Thus, relocation studies should consider not only the physical dimension but also the social and psychological dimensions of displacement, to explain better why the wellbeing of relocatees appears to differ even when they have experienced an apparently similar displacement process.

Place attachment exactly captures the social and psychological dimensions of displacement. In this study, we integrate place attachment literature with displacement literature and hypothesise that older adults with stronger original place attachment would be more likely to feel displacement and suffer psychological adjustment problems after relocation. We used the person–process–place framework to understand place attachment in a relocation context. Regarding person, older adults lose the special meaning of their rural village, such as their rootedness and ancestor worship. In the relocation process, the bonds between the individual and place are disrupted and reconstructed. Regarding place, rural villages and

urban communities have different physical and social environments. According to Cernea's (1997) impoverishment risks and reconstruction model, relocation commonly accompanies risk factors such as landlessness, homelessness and social disintegration, which would indirectly affect relocatees' health. Relocatees' strong attachment to their old neighbourhoods reduced their social interaction in their new neighbourhoods, and relocatees wanted to move back because of their familiarity with their original neighbourhoods (Li *et al.*, 2019). Older adults with strong attachment to their rural villages might be more likely to immerse themselves in sadness and nostalgia, and suffer more intensely from displacement, making them less likely to adapt actively to the urban life. Thus, we hypothesise that older adults with a strong RPA may experience more depressive symptoms.

Neighbourhood social cohesion in a relocation place

Previous studies have highlighted social integration as a protective mechanism with which to achieve healthy ageing after displacement (Cao *et al.*, 2012; Gilroy, 2012; Singh *et al.*, 2018). Chinese rural older adults perceived fewer social support resources to be available after relocation (Wu *et al.*, 2016), and constructing neighbourhood social ties in the new place would be helpful for their relocation adjustment. NSC – which refers to support, interaction, trust and reciprocity among neighbourhood members – indicates the quality of a neighbourhood environment (Bromell and Cagney, 2014; Robinette *et al.*, 2018). The core element of NSC is positive social relationships (Maleku *et al.*, 2019), which provide residents with socio-emotional resources in times of distress (Riina *et al.*, 2013). NSC can enhance residents' physical and mental health by fostering a host of favourable outcomes, including social interaction, outdoor activities, access to services and amenities, healthy behaviours, increased friendship quality and feelings of safety (Fone *et al.*, 2007; Bromell and Cagney, 2014; Choi and Matz-Costa, 2018). Older adults are more likely to attach themselves to a neighbourhood environment and to depend on their neighbourhood as a source of social integration than younger adults (Cramm *et al.*, 2013). Social support within neighbourhoods can improve older adults' relocation adjustment outcomes, such as promoting residential satisfaction and reducing depression (Chao, 2017). Thus, NSC in a relocation place would be negatively associated with older adults' depression.

The stress process model contains three main components – stressors, psycho-social resources and stress outcomes – and suggests psycho-social resources as mechanisms linking stressors to stress outcomes (Cao *et al.*, 2012). These stressors include primary and secondary stressors; primary stressors occur first in one's experience and have a direct effect, whereas secondary stressors are usually triggered by primary stressors (Pearlin, 1989). Displacement is often accompanied by secondary stressors such as deterioration of social integration, socio-economic status and community resources, which would exacerbate relocatees' psychological maladjustment (Cao *et al.*, 2012). However, not all displaced individuals are similarly exposed to secondary stressors; thus, the distinction between primary and secondary stressors helps to link stressful conditions to stress outcomes better. For example, a high level of NSC could weaken the association between income deprivation and mental health (Fone *et al.*, 2007), mitigate the adverse effects of low

neighbourhood safety on the psychological health of older adults with limited physical functioning and attenuate the adverse effects of loss (such as being single and poor) on the wellbeing of older adults (Choi and Matz-Costa, 2018). According to the socio-ecological model of health, the impacts of relocation may depend not only on the individuals but also on attributes of their communities (Le et al., 2013). Displaced older adults who participated more often in outdoor activities showed fewer depressive symptoms but only when they had high community cohesion (Chao, 2016). Communities with high NSC can provide social support to help community members cope better with traumatic events and buffer their experiences of stressors (Le et al., 2013). After a natural disaster, displaced persons who resided in counties with high NSC experienced lower rates of depression than those who resided in counties with low NSC (Le et al., 2013). Thus, we hypothesise that NSC in a relocation place will attenuate the association between RPA and depression.

Sense of community in a relocation place

Researchers usually define *community* according to shared geographical locations, such as neighbourhoods and cities, or according to social ties and relationships, such as clubs and organisations (Mak et al., 2009). However, *community* has a specific meaning in the Chinese context and acts more as an institutional model of urban governance than as a place in which to cultivate social relations (Bray, 2006; Zhu et al., 2012). The Chinese government has treated communities as the basic unit of urban social, political and administrative organisation, and has appointed neighbourhood committees as grassroots administrative units to implement governance and provide vital social services to citizens since the 1990s (Zhu et al., 2012; Yip et al., 2013; Zhang et al., 2017). Since rural villages and urban communities are quite different in terms of administration, it is not easy for older adults to form a sense of community after relocation. In this study, we investigated whether older adults' SOC would protect them from depression after relocation.

SOC is defined as 'the sense that one belongs in and is meaningfully part of a larger collectivity' (Sarason, 1974: 41); it refers to an individual's experience or evaluation of community life as a whole, which urban studies and community psychology particularly emphasise (Yetim and Yetim, 2012). McMillan and Chavis (1986) proposed a theoretical model of SOC that contains four elements: group membership (a feeling of belonging), influence (one matters or can make a difference in a community's decision-making), need fulfilment (the community can meet one's needs) and shared emotional connection (a feeling of attachment or bonding rooted in members' shared history and experience). Residents with a strong SOC could experience many positive outcomes, such as physical health and psychological wellbeing (Yetim and Yetim, 2012). SOC is also a protective factor against traumatic experiences (Li et al., 2011). For example, for earthquake survivors, a sense of belonging in a new community promoted life satisfaction and reduced depression (Li et al., 2011; Huang and Wong, 2014; Huang et al., 2016). In a relocation situation, SOC promoted older women's wellbeing and decreased their depression and loneliness (Zhang, 2019).

Although previous studies have indicated social integration to be a protective mechanism in relocation, they did not illuminate how NSC and SOC interact to

mitigate the negative impact of relocation. Especially in China, the connotations of community in rural areas and in urban cities are quite different, thus, it is necessary to investigate the role of SOC in rural-to-urban relocation adjustment. In fact, NSC and SOC are two different concepts. NSC represents the neighbourhood's social resources, while SOC represents the perceptions of the whole community, including the community's administration, environment and services. Although rural older adults move into urban communities and become urban residents after relocation, some may lack a SOC while living there due to the different administrative styles between rural villages and urban communities. A lack of SOC may hamper a neighbourhood's positive role in promoting relocation adjustment. For example, relocatees without SOC are less likely to be involved in community activities to take advantage of social resources within their neighbourhood to cope actively with the adversities of relocating. On the contrary, relocatees with a stronger identity of urban community are more likely to keep a good relationship with their neighbours and NSC may be more prominent to reduce depression after relocation. Thus, NSC's buffering role would depend on SOC in the relocation place, and NSC could alleviate the association between RPA and depression among older adults with a stronger SOC.

In summary, previous studies on relocation usually took displacement as a dichotomous variable. However, relocatees may have different psychological perceptions of displacement, and their wellbeing appears to differ even when an apparently similar relocation process is experienced. Thus, this study investigates the role of rural place attachment in relocation adjustment among Chinese older adults in rural-to-urban relocation. In addition, although previous studies have indicated that social integration is a protective mechanism for relocation, they did not illuminate how it specifically works. In this study, we examined how NSC and SOC in the relocation place interact to mitigate the association between RPA and depression. We hypothesised the following (Figure 1):

(1) RPA would be positively associated with depression.
(2) NSC in the relocation place would weaken the positive association between RPA and depression.
(3) The buffering role of NSC would depend on SOC in the relocation place. Specifically, NSC could buffer the association between RPA and depression among older adults with a strong SOC but not among older adults with a weak SOC.

Methods

Participants and procedure

We conducted this study in six rural-to-urban communities located in peri-urban areas in Chengdu, in Sichuan province of China. These relocation communities were established within the last five years. The majority of the residents in these communities are peasants who relocated from rural villages ten kilometres or more away. Peasants from different villages may be placed in one urban community because of the greater capacity of urban buildings. After relocation, these peasants
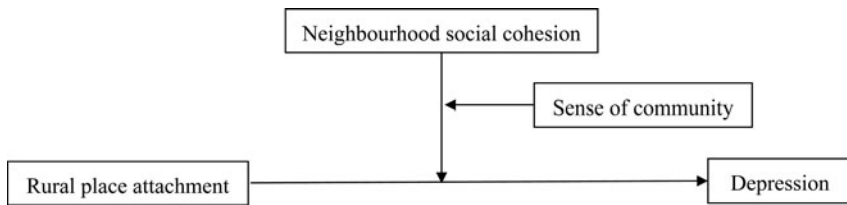
Figure 1. The hypothesised theoretical model.

become urban residents, and their village committees become neighbourhood committees.

We conducted this study with the help of a social work organisation that provides community services to improve residents' quality of life. Under the government-purchased service model, many social work organisations are involved in community services, and this social work organisation provides community elderly services purchased by the government. We involved these six communities in our study because this social work organisation provided services for them, which made them a convenient sample for our study. This organisation helped us to recruit participants, contact neighbourhood committees, and arrange the time and place for our surveys. This organisation had no further role in the study design, the data analysis, the data interpretation, writing the report or the decision to submit the article for publication. We recruited participants aged 60 years old or above and excluded those with cognitive impairment and mental health problems, as well as those who had not experienced rural-to-urban relocation. The participants completed the surveys in their community centres, which took about 30 minutes, and each participant earned 20 RMB as an incentive. Because the participants generally had low levels of education and some had vision problems, to ensure participants' comprehension of the questions, all the participants completed the questionnaire orally through an ask-and-answer procedure. We recruited students majoring in social work at Chongqing University as interviewers to collect data and they received standardised training on psychological survey before conducting the research. This study obtained ethical approval from the Ethical Review Board of Chongqing University. We orally introduced our research purpose to participants and asked their consent before survey, and they can quit this survey at any time. As this study did not have any harm to participants, we did not prepare written consent for their signature.

Measures

RPA was assessed with six items adapted from the Place Attachment Scale used by Wirth *et al.* (2016). The items are presented in Table 1. We used translation and back-translation to obtain the Chinese version of this scale. First, two psychology professors who understand both Chinese and English translated the scale from English to Chinese independently. Then, the authors of the current study and the two translators came together to synthesise the two Chinese versions and discuss the inconsistent or ambiguous wording. After that, another two bilingual psychology professors translated the Chinese version back to English. We compared

Table 1. Measurement items for the study variables

Rural place attachment (Wirth *et al*., 2016): To what extent do you think the following descriptions are true for you? (five-point Likert scale ranging from 1 = not at all true for me to 5 = very true for me):

1. The rural village is the ideal residential location for me.

2. It would be very hard for me to leave the rural village.

3. I would willingly live in the rural village forever.

4. I have much in common with the rural village.

5. I identify with the people in the rural village.

6. I feel integrated in the rural village.

Neighbourhood social cohesion (Fone *et al*., 2007): To what extent do you think the following descriptions are true for you? (five-point Likert scale ranging from 1 = not at all true for me to 5 = very true for me):

1. I visit my neighbours in their homes.

2. The friendships and associations I have with other people in my neighbourhood mean a lot to me.

3. If I need advice about something I could go to someone in my neighbourhood.

4. I believe my neighbours would help in an emergency.

5. I borrow things and exchange favours with my neighbours.

6. I would be willing to work together with others on something to improve my neighbourhood.

7. I rarely have a neighbour over to my house to visit. (R)

8. I regularly stop and talk with people in my neighbourhood.

Sense of community (Peterson *et al*., 2008): How much do you agree with the following descriptions? (five-point Likert scale ranging from 1 = very strongly disagree to 5 = very strongly agree):

1. I can get what I need in this community. (Needs fulfilment)

2. This community helps me fulfil my needs. (Needs fulfilment)

3. I feel like a member of this community. (Group membership)

4. I belong in this community. (Group membership)

5. I have a say about what goes on in my community. (Influence)

6. People in this community are good at influencing each another. (Influence)

7. I feel connected to this community. (Shared emotional connection)

8. I have a good bond with others in this community. (Shared emotional connection)

Depression (Boey, 1999): How often you had felt in the following ways during the past week? (0 = rarely or none of the time; 1 = some or a little of the time; 2 = occasionally or a moderate amount of time; 3 = most or all of the time):

1. I felt fearful.

2. I felt depressed.

3. I could not 'get going'.

4. I was bothered by things.

5. I felt everything was an effort.

6. I felt lonely.

7. I had trouble keeping my mind.
8. My sleep was restless.
9. I felt hopeful about future. (R)
10. I was happy. (R)

Note: R: reverse coded.

the back-translated version with the original scale to make sure of the accuracy of the translation. Before the data analysis, we examined the factor structure of this scale using exploratory factor analysis with the principal component analysis method. The results showed that the six items loaded on one factor, which explained 62 per cent of the total variance. The items' factor loadings ranged from 0.66 to 0.86. The correlations between each item and the total RPA score ranged from 0.66 to 0.85. These results indicated good psychometric properties of this scale. We added up the scores of the six items, with higher scores indicating higher levels of RPA (in this study, Cronbach's alpha coefficient, $\alpha = 0.86$).

NSC in relocation communities was measured with eight items developed by Fone *et al.* (2007) (Table 1). Yu *et al.* (2019) reported that the Chinese version of this instrument had good psychometric properties, so we adopted this Chinese version in this study. We computed the total score of these items, with higher scores representing participants perceiving higher levels of NSC (in this study, $\alpha = 0.70$).

SOC in relocation places was measured with the Brief SOC Scale (Peterson *et al.*, 2008) (Table 1). The scale contained four dimensions: needs fulfilment, group membership, influence and shared emotional connection. This measure has been widely used with Chinese participants (*e.g.* Li *et al.*, 2011; Huang and Wong, 2014; Zhang *et al.*, 2017; Zhang, 2019). We obtained the Chinese version of the SOC scale from Zhang *et al.* (2017). The higher summed scores of this scale indicated participants' stronger SOC (in this study, $\alpha = 0.85$).

Depression was measured with the ten-item Center for Epidemiologic Studies Depression Scale (Boey, 1999) (Table 1), which has been demonstrated to be a valid and reliable instrument for measuring depressive symptoms among Chinese older adults (Boey, 1999; Cheng and Chan, 2005). We obtained the Chinese version of this scale from Cheng and Chan (2005). The higher summed scores of the ten items indicated more depressive symptoms (in this study, $\alpha = 0.76$).

The control variables included age (in years), gender (1 = male, 0 = female), education (illiterate, primary education, or secondary education or above), monthly income (<1,000, 1,000–2,000, 2,001–3,000 or >3,000 RMB), marriage status (1 = with a spouse, 0 = single (unmarried/divorced/widowed)), physical health (participants reported whether they had any of the following diseases: hypertension, cardiopathy, diabetes, coronary artery disease, cerebral haemorrhage, asthma, rheumatism, stroke, obesity, stomach illness, eye disease, tumour and other diseases specified by participants; 1 = without disease, 0 = with one or more diseases), living arrangements (1 = alone, 0 = with a spouse, children or others), dwelling time (in months) and whether they take care of grandchildren (1 = yes, 0 = no).

Statistical analysis

We computed Pearson correlations to determine the bivariate associations among the study variables. In a regression analysis, we used the z scores of study variables and treated age, gender, marital status, education, income, physical health, dwelling time, living arrangements and taking care of grandchildren as covariates. We first examined the association between RPA and depression. Then, we entered the two-way interaction term of RPA × NSC into the regression model to examine the moderating effect of NSC. Finally, we entered the three-way interaction term of RPA × NSC × SOC into the regression model to examine whether NSC's moderating effect was dependent on SOC. We used slope-difference tests to interpret the interaction results further (Dawson and Richter, 2006). To interpret the conditional effect, we defined high and low values of moderators as one standard deviation above and below the mean, respectively. We used SPSS 22.0 to obtain the general descriptive statistics and bivariate associations between the variables and considered $p < 0.05$ as statistically significant. We performed the moderation analysis with PROCESS version 2.13 for SPSS (Hayes, 2013; for more information, *see* http://www.afhayes.com/).

Results

In total, 224 older adults participated in this survey: 90 men (40.2%) and 134 women (59.8%). The participants were an average of 70 years old (range 60–94). Table 2 describes their socio-demographic information.

Table 3 presents the correlations of the study variables. RPA was positively associated with depression ($r = 0.52$, $p < 0.01$) and negatively associated with SOC ($r = -0.24$, $p < 0.01$). NSC ($r = -0.15$, $p < 0.05$) and SOC ($r = -0.25$, $p < 0.01$) were negatively associated with depression. In the regression model, RPA was associated with higher depression (Table 4, Model 2, $\beta = 0.52$, $p < 0.001$), NSC was associated with lower depression (Table 4, Model 2, $\beta = -0.12$, $p < 0.05$), and the association between SOC and depression was not significant after controlling for covariates (Table 4, Model 2, $\beta = -0.06$, $p > 0.05$). These results support Hypothesis 1: RPA was positively associated with depression.

The interaction of RPA × NSC was significant in predicting depression (Table 4, Model 3, $\beta = -0.17$, $p < 0.01$). The association between RPA and depression was weaker for individuals with high NSC (slope = 0.34) than for individuals with low NSC (slope = 0.69; Figure 2). These results support Hypothesis 2: NSC weakened the association between RPA and depression.

The three-way interaction of RPA × NSC × SOC was significant in predicting depression (Table 4, Model 4, $\beta = -0.13$, $p < 0.05$), which means that the interaction effect of RPA × NSC depended on SOC. We report the interaction effects of RPA × NSC at different SOC values (Table 5; low, one standard deviation (SD) below the mean; moderate, the mean; and high, one SD above the mean). For individuals with low SOC, the interaction effect of RPA × NSC was not significant (interaction effect = -0.0391, 95% confidence interval (CI) = -0.2256, 0.1473). For individuals with mean and high SOC, the interaction effect of RPA × NSC was significant (interaction effect$_{\text{mean SOC}} = -0.1767$, 95% CI = -0.3018, -0.0515; interaction

Table 2. Socio-demographic information of the participants

Variable	N (%)
Mean age (SD; range)	70.3 (8.8; 60–94)
Mean dwelling time (months) (SD; range)	12.5 (11.2; 1–48)
Gender:	
Male	90 (40.2)
Female	134 (59.8)
Marital status:	
With a spouse	158 (70.5)
Single (unmarried/divorced/widowed)	66 (29.5)
Education:	
Illiterate	88 (39.3)
Primary education	78 (34.8)
Secondary education or above	58 (25.9)
Monthly income (RMB):	
<1,000	27 (12.1)
1,000–2,000	122 (54.5)
2,001–3,000	38 (17.0)
>3,000	37 (16.4)
Physical health:	
Without a disease	132 (58.9)
With one or more diseases	92 (41.1)
Living arrangement:	
Alone	27 (12.1)
With spouse, children or others	197 (87.9)
Taking care of grandchildren:	
Yes	102 (45.5)
No	122 (54.5)

Notes: N = 224. SD: standard deviation. US $1 = 6.5 RMB.

effect$_{high\ SOC}$ = −0.3142, 95% CI = −0.4920, −0.1363). These results show that the buffering effect of NSC on the association between RPA and depression increased with SOC. Specifically, for individuals with weak SOC, NSC did not moderate the association between RPA and depression (the left panel of Figure 3, slope-difference test t = −0.412, p = 0.681). For individuals with a strong SOC, NSC moderated the association between RPA and depression (the right panel of Figure 3, slope-difference test t = −3.492, p = 0.001). These results indicate that the moderating effect of NSC depends on SOC, which supports Hypothesis 3.

Table 3. Descriptive statistics and bivariate correlations of the study variables

Variable	Mean (SD)	1	2	3	4
1. Rural place attachment	16.43 (4.77)	–	−0.04	−0.24**	0.52**
2. Neighbourhood social cohesion	31.64 (4.31)		–	0.36**	−0.15*
3. Sense of community	34.24 (3.53)			–	−0.25**
4. Depression	7.53 (4.48)				–

Notes: N = 224. SD: standard deviation.
Significance levels: * $p < 0.05$, ** $p < 0.01$.

Table 4. The interaction effect of rural place attachment, neighbourhood social cohesion and sense of community on depression

Variable	Model 1	Model 2	Model 3	Model 4
	Standardised coefficients			
Covariates:				
Age (range 60–94)	−0.08	−0.01	0.00	−0.02
Gender (1 = male, 0 = female)	0.05	0.00	0.01	0.01
Marital status (1 = with a spouse, 0 = single)	0.02	0.00	0.00	−0.01
Education 1 (1 = illiterate, 0 = others)	−0.06	0.06	0.05	0.06
Education 2 (1 = primary education, 0 = others)	−0.10	0.02	0.02	0.00
Income (range 1–4)	−0.17*	−0.13	−0.11	−0.11
Physical health (1 = without disease, 0 = with one or more diseases)	−0.21**	−0.16**	−0.17**	−0.15*
Dwelling time (range 1–48 months)	0.02	−0.01	0.00	0.01
Living arrangement (1 = alone, 0 = with others)	0.08	0.10	0.10	0.10
Taking care of grandchildren (1 = yes, 0 = no)	0.04	0.09	0.10	0.09
RPA		0.52***	0.52***	0.57***
NSC		−0.12*	−0.14*	−0.18**
SOC		−0.06	−0.05	−0.03
RPA × NSC			−0.17**	−0.17**
RPA × SOC				0.00
NSC × SOC				−0.06
RPA × NSC × SOC				−0.13*
R^2	0.10***	0.37***	0.40***	0.42***

Notes: N = 224. RPA: rural place attachment. NSC: neighbourhood social cohesion. SOC: sense of community.
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Discussion

We found that Chinese older adults with stronger attachment to their rural place reported more depressive symptoms, which supports Hypothesis 1. In addition,
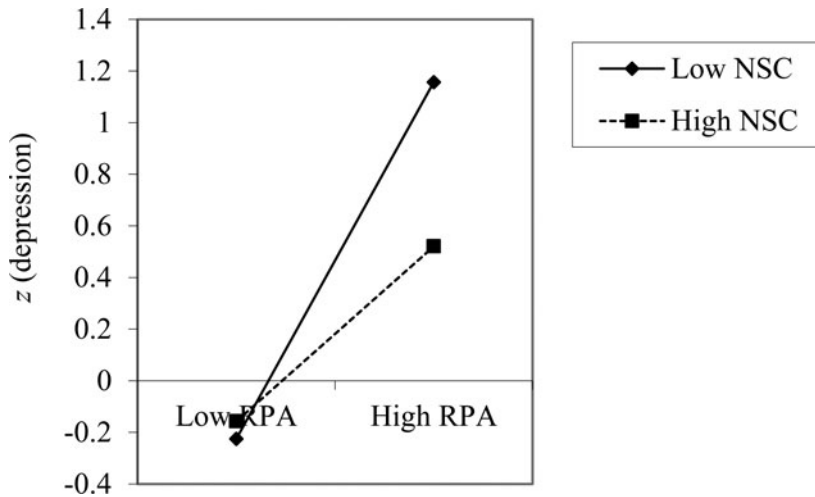
Figure 2. The association between rural place attachment (RPA) and depression with neighbourhood social cohesion (NSC) as a moderator.

Table 5. Conditional interaction effect of rural place attachment × neighbourhood social cohesion at different values of sense of community (SOC)

SOC	Interaction effect	Standard error	95% confidence interval
Low	−0.0391	0.0946	−0.2256, 0.1473
Moderate	−0.1767	0.0635	−0.3018, −0.0515
High	−0.3142	0.0902	−0.4920, −0.1363

the association between RPA and depression was weaker for older adults perceiving high NSC than those perceiving low NSC, which is consistent with Hypothesis 2. Moreover, the buffering role of NSC was only manifested for older adults with a strong SOC and not for those with a weak SOC, which supports Hypothesis 3. These findings have theoretical contributions as follows. First, we expand the place attachment theory into a rural-to-urban relocation situation, that place attachment captures the psychological sense of displacement and is a destructive factor for relocatees' mental health. Second, we supplement NSC as the psychosocial resources in the stress process model to protect older adults from the negative effect of relocation. Third, we apply the SOC theory into a Chinese relocation context, that SOC is an important part of urban community integration. These findings have practical implications for improving older adults' psychological adjustment to rural-to-urban relocation.

We expand the place attachment theory by showing that although place attachment can benefit residents' wellbeing, it captures the psychological sense of displacement and is a destructive factor for relocatees' mental health in a relocation context. Our findings were consistent with previous literature showing that displacement was associated with higher risk of depression (Cao *et al.*, 2012; Le
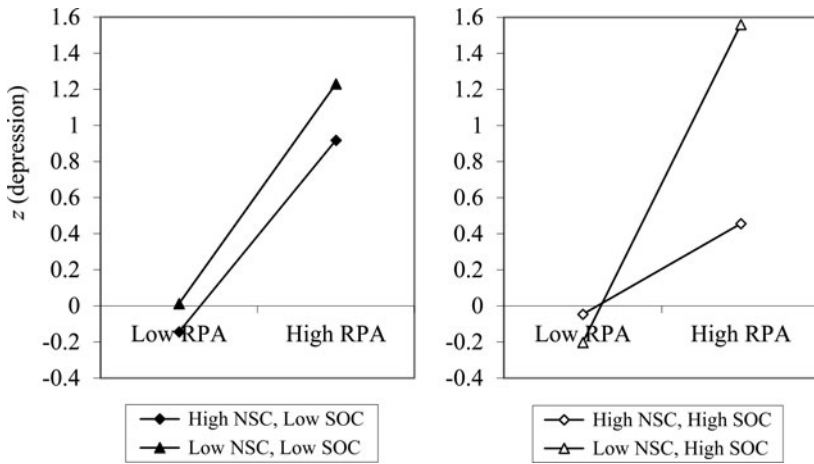
Figure 3. The moderating role of neighbourhood social cohesion (NSC) in the association between rural place attachment (RPA) and depression in conditions with low sense of community (SOC) and high SOC, respectively.

et al., 2013). However, this study was different from previous literature that compared displaced with non-displaced relocatees or that took displacement as a background variable for all of the relocatees (*e.g.* Kuwert *et al.*, 2009; Cao *et al.*, 2012; Le *et al.*, 2013), we used rural place attachment to capture individuals' sense of displacement and found that a strong attachment to one's previous place may hinder one's psychological adjustment to a relocation place. Under a relocation programme, all of the relocatees experience physical displacement, but the psychological and social dimensions of their displacement may be quite different (Kearns and Mason, 2013). Place attachment can describe what actually happens within relocation processes as well as the effects upon residents (Kearns and Mason, 2013). We found that the negative effect of relocation depended on how attached relocatees were to their original place. Generally, place attachment may be a protective factor for residents' psychological wellbeing (Scannell and Gifford, 2016, 2017). However, in a relocation situation, a strong original place attachment may work against adaptation to one's relocation place. Some researchers believe that people's place attachment in their daily lives generally exists in the subconscious and that this attachment is expressed only when the individual leaves the place (Hidalgo and Hernández, 2001).

Chinese culture emphasises that fallen leaves return to the roots. Some Chinese older adults live in rural villages their whole lives and integrate the memories of their ancestors and life events into their living place; thus, they perceive leaving a rural village for a new residence as a loss of their roots. Chinese older adults' strong rural village attachment might cause them to immerse themselves in sadness and nostalgia following relocation, making them less likely to adapt to life in an urban community. With China's rapid urbanisation, the government needs to consider how to guarantee the quality of life of older adults, especially those with strong RPA, after relocation to urban areas.

We stress NSC as the psycho-social resources in the stress process model to protect older adults from the negative impact of relocation. This finding is consistent with those of previous studies such as Le *et al.* (2013) that high county-level social cohesion could protect displaced individuals from suffering from depression, and it supports the socio-ecological model of health, which indicates that relocation's impacts depend not only on individuals but also on attributes of their communities (Le *et al.*, 2013). In another study on Chinese people's relocation, Cao *et al.* (2012) took social integration and community resources as mediators between displacement and depression, whereas we took community social cohesion as a moderator between RPA and depression, and both studies demonstrated that community social integration is a protective mechanism in displacement. In summary, these results demonstrate the key role of psycho-social resources in the stress process model (Pearlin, 1989), in that although relocation may act as a stressor, psycho-social resources could protect individuals from negative stress outcomes. In addition, the secondary stressors that usually accompany relocation, such as deterioration in social integration and community resources, should be avoided as much as possible to reduce relocation maladjustment (Cao *et al.*, 2012). However, in China, the social interactions in urban neighbourhoods are weaker and perceived as being less important than those in rural villages (Zhu *et al.*, 2012). Given the influence of privatism and individualism, the importance of urban neighbourhoods for constructing social ties has declined, and the role of urban neighbourhoods has gradually transformed from that of a social support system to that of a grassroots political movement (Zhu *et al.*, 2012). Urban community neighbourhood committees should help older adults to form new social connections, such as through organising activities to reduce older adults' psychological distress.

We highlight SOC as an important part of urban community integration, which expands the SOC theory into a Chinese relocation context. SOC reflects one's general perceptions of the urban community and also includes the identity of the grassroots government due to the unique meaning of *community* in the Chinese context (Bray, 2006; Zhu *et al.*, 2012). These results indicate that the protective role of NSC depends on how older adults perceive their urban community. Older adults with a strong SOC in an urban community are more likely to benefit from NSC. Relocation from a rural village to an urban community is accompanied by changes to one's community management, lifestyle, social network, and so on, and forming a new identity and sense of belonging in an urban community in a short time is hard for older adults. We also found a negative association between RPA and SOC in this study, which indicates that older adults with stronger attachment to their rural village were less likely to form a SOC in an urban community. These results indicated that not only social cohesion but also the psychological sense of urban community act as protective factors in rural-to-urban relocation adjustment. Although previous studies have consistently demonstrated the benefits of SOC, this study expands the benefits of SOC to a relocation situation. Urban community neighbourhood committees should consider interventions such as community activities and services for elderly people to strengthen older adults' SOC after relocation.

We must acknowledge some limitations in this study. First, we cannot infer any causal relationships between the study variables from this cross-sectional design. Nevertheless, this study indicated a positive association between RPA and

depression, as well as the moderating roles of NSC and SOC in the rural-to-urban relocation context. Future studies may use longitudinal or experimental studies to examine the relationships between the study variables further. Second, due to the difficulty of strict probability sampling, we used convenience sampling in this study, which may restrict the conclusions' generalisability. Third, the self-reported measures used in this study might induce common method variance and overestimation of the correlations between the study variables. Future studies may consider using multiple data sources to investigate older adults' relocation adjustment. Lastly, this study was conducted in the Chinese context; whether these results can be applied to other cultures needs further examination.

In summary, Chinese older adults with stronger attachment to a rural place experienced more depressive symptoms after rural-to-urban relocation. In addition, protective factors related to neighbourhoods and communities in a relocation place could interact to mitigate the negative impacts of relocation. Community managers should consider interventions aimed at enhancing NSC and SOC to improve older adults' adjustment to their relocation.

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