Chapter 11

Characterising Social Integration Between Rural Migrants and Local Residents in Urban China: An Exploratory Social Network Analysis of Care Workers in Shanghai

Wenjing Zhang and Yiming Wang

Abstract Recent decades have witnessed large migration flows from rural to urban China. This chapter explores the potential of social network analysis (SNA) for assessing and understanding social integration in contemporary Chinese cities. We begin by presenting the background and the complex, multi-dimensional and inter-connected factors that typically affect segregation and inequality within urban China. SNA is introduced as a potential analytical approach for characterising and examining the ongoing dynamic social integration process. We discuss some initial findings based upon an exploratory case study in Shanghai on multi-dimensional segregation in the social care sector. We also identify the limitations of SNA as a relatively innovative method for researching social integration and call for a mixed-methods approach towards its application in examining the intricacy and complexity of social integration in contemporary urban China.

Keywords Migrants · Social network analysis · Integration · Urban China · Care

11.1 Introduction

Social integration involves the co-existence of individuals or groups in a society and the connectedness and interactions between them. There have been many academic discussions about the definition and measurement of integration, including social attraction bonds between individuals and exchange processes in groups (Blau 1960); social connectedness and linkage with families and friends (Fischer 2011); connectedness between people from different neighbourhoods (Ndofor-Tah et al.

W. Zhang (✉)

Centre for Health Services Studies, University of Kent, Canterbury, UK
e-mail: w.j.zhang@kent.ac.uk

Y. Wang

School for Policy Studies, Centre for Urban and Public Policy Research, University of Bristol,
Bristol, UK
e-mail: yiming.wang@bristol.ac.uk

2019) and barriers to integration within a society (Phillips et al. 2019). The multi-dimensional term encompasses factors like social roles, participation in various activities, perceived beliefs (Brissette et al. 2000); social control (Umberson 1987); access to resources and opportunities and social mixing (Ndofor-Tah et al. 2019). These different definitions naturally entail different approaches to the measurement of social integration.

The benefits of harmonious social integration are readily apparent. Social integration has proven associations with better health outcomes (Seeman 1996), increased social capital, civic participation, trust and solidarity within neighbourhoods and society (Putnam 2000; Brissette et al. 2000), as well as lower violent crime and conflict (Sampson et al. 1997; Putnam 2000; Phillips et al. 2019). Although social integration is an essential feature of cosmopolitan urban life worldwide (Musterd and Ostendorf 1998), there is still a need to analyse how societies are integrated in relation to each particular context and timeframe (Phillips et al. 2019). The achievement of socially integrated, inclusive and connected urban development is a current trend in Chinese megacities such as Beijing, Shanghai and Guangzhou. All have witnessed exponential immigration from the Chinese countryside since the early 1980s. The result is a dynamic, but sometimes daunting, process of social integration between rural migrants and local residents in urban China (Zhao and Wang 2018).

The spatial and social separation of population groups by religion, race, ethnicity, country of birth, income or class (Piekut et al. 2019; Yao et al. 2019; see Chaps. 2, 4, 10 and 15), and the underlying problems of inequality (Chap. 15), are often covert, complex, and mingled with a myriad of local socio-economic factors. Compared to Anglo-American studies, current research on social segregation in urban China is arguably insensitive to these cross-cultural subtleties. In the UK and the USA, the word 'segregation' often connotes racial apartheid and/or discrimination (Zhao and Wang 2018). Therefore, it is necessary to characterise social segregation within a specific urban Chinese context, consciously reconstructing the meaning of 'segregation' through applied empirical research. This chapter aims to set out the intellectual framework for such inquiries.

As explored in earlier chapters (particularly Chaps. 4, 8, and 9), rural migrants face inequality in different settings in urban China, where there are barriers and challenges for the assessment and reporting of segregation and exclusion. The rapid rural-urban migration flow has accelerated both heterogeneity and disparities in urban China. This introduces different forms of segregation and inequality, which have been insufficiently considered so far. This chapter aims to explore how cutting-edge techniques can be employed to understand segregation in Chinese cities. It pays particular attention to how problems of exclusion and inequality emerged and developed and offers a comprehensive perspective. It examines the potential use of the social network analysis (SNA) approach to assess these problems and further develops the analytical methods, especially in understanding social integration and segregation in different urban settings.

Social network analysis originated from the sociology literature and presented itself as an analytical approach to examining complex social relationships (Scott

1988). Since the early 1930s, SNA has evolved in three main ways: (i) the development of sociometric analysis—it was used initially by sociologists as a way of coding and visualising social connections; (ii) mathematical analysis—the development of sophisticated and powerful analytical tools for modelling the structure, formation and dynamics of social networks; and (iii) anthropological analysis—researchers at the University of Manchester used SNA to construct a detailed understanding of the structure of community relations (see a historical overview by Fredericks and Durland 2005). These developments coalesced to form contemporary SNA during the 1960s and 1970s and have subsequently been further developed with the advancement of computer-based analysis techniques (Kilduff and Tsai 2003; Fredericks and Durland 2005). The origins of this approach also explain the key methodological procedures and techniques of current SNA, including the analysis of sociometric data using matrix techniques, providing mathematical models of group structures, and using graph theory methods.

In this chapter, we intend to demonstrate an explorative application of SNA within an urban Chinese context, and reflect on the merits and limitations of current methods. We begin by examining segregation between rural migrants and urban residents in China, with an in-depth analysis of the historical background, previous analysis and the complex, multi-dimensional and inter-connected factors driving segregation and inequality in urban China (Chap. 15). The second section introduces the application of SNA to understand different facets of segregation. It identifies the limitations of the methods, gives examples of the application of SNA in the social care field, and explores adjustments to the traditional approach. The third section comprises a case study on the application of SNA to understand the segregation of rural migrant care workers in residential care homes in Shanghai. The case study highlights the importance of exploring multi-dimensional aspects of inequality and intersectionality—where multiple layers of disadvantaged identities interact with each other (see Chap. 11)—among rural migrants in urban China. This chapter also examines the ways SNA could be refined or developed to understand the relationships between individuals and groups. The final section summarises the strengths and limitations of these methods and suggests the potential of a mixed methods approach integrating the application of SNA and in-depth qualitative inquiries to investigate social integration between rural migrants and urban residents in contemporary China.

11.2 Segregation Between Rural Migrants and Urban Residents in China

The migration of rural labour to urban areas has been a major factor in demographic change throughout China's recent socio-economic reforms (see Chap. 5). Significant disparities between rural and urban areas and the gradual loosening of migration regulations have contributed to increasing internal migration. Most internal migration is from poorer, less developed areas, and this has led to an increasing eastward and

urban concentration (Wang 2000). Migration to urban areas has become the most common way for rural residents to obtain non-agricultural jobs since the 1990s (Connelly et al. 2018). Temporary rural migrants have no official local household registration (*hukou*) but are engaged in economic and other activities in urban areas (Gu 1992; Sun 2000).

Over 288 million rural residents have migrated to urban areas in search of better income (National Bureau of Statistics of China 2019). Contemporary Chinese urban life is characterised by rural migrants and urban residents operating in different settings, for activities such as work and education. Although links and interaction between rural migrants and urban residents are increasing significantly, there remain general and specific segregation and integration issues. The integration of rural migrants into urban settings is now a key focus of Chinese social policy (Wang et al. 2016). Researchers have also raised awareness of the levels of integration or segregation of migrants in urban China, for example, social interaction at the neighbourhood level (Wang et al. 2016), segregation in everyday activities (Zhao and Wang 2018), and occupational segregation and earnings (Zhang and Wu 2017).

Fan (2002) analysed the population composition of urban China based on human capital attributes, mobility resources, labour market entry and shifts in employment patterns. She identified a hierarchy that includes temporary migrants (without local *hukou*) at the bottom, non-migrant locals in between, and permanent migrants as the 'elite' at the top. The assimilation of migrants into urban society is not guaranteed (Chen and Liu 2018). It occurs based largely on education, labour market entry, upward social mobility, family socio-economic background, and interactions with local friends and neighbours. Only a small number could achieve permanent citizenship (*hukou*) and become 'elite' migrants. Such a hierarchy based on migration and *hukou* status illustrates the disparities in economic success among residents and distinct differences between migrants and locals and within migrant groups themselves (Chap. 8).

Based on a study on the variation of interaction between locals and migrants in Nanjing, Wang et al. (2016) argue that *hukou* status does not seem to play an important role in social interactions with neighbours. However, such social interactions cannot reveal the full extent of meaningful interactions between rural migrants and urban residents. Rural migrants commonly live in migrant-dominant neighbourhoods such as urban villages (Wang et al. 2009). Due to high population density and condensed dwelling patterns, segregation in urban China is much more finely-grained on a spatial scale than geographical segregation tends to be in western countries (Zhao and Wang 2018). It is not uncommon to find poorer residential blocks alongside wealthier neighbourhoods. Rural migrants and local indigenous residents may nevertheless lack meaningful social interactions even when they live in neighbouring blocks.

Survey results from Wang et al. (2016)'s study suggest that rural migrants are 1.8 times more likely to communicate with locals than the other way around. Migrants are also 1.8 times more likely to help or receive help from local residents than vice versa. This reveals the problem of low-level social ties between these groups and the difficulties for further integration of rural migrants into urban society. A further

study from Zhao and Wang from 2018 suggested that the locals have stronger internal bonds and links compared to their connections with rural migrants.

Consequently, the assessment of such segregation and raising awareness of its impact become vital issues for policy-makers and researchers. Assessment can be conducted across multiple areas such as housing, neighbourhood, occupation, education, ethnicity and gender. In many cases, traditional assessment methods that focus on investigating residential segregation would fail to show the fine-grained segregation that exists across Chinese cities. Many inner-city neighbourhoods have an extremely high housing density, which can lead to the under-estimation of segregation at a neighbourhood level (Zhao and Wang 2018).

Furthermore, the segregation of rural migrants segments even further into individual levels of marginalisation or disadvantage, for example, gender, age, and ethnicity. What is required is an 'intersectional' approach that highlights the way that these multi-layered identities interact. The concept of intersectionality originates from critical race studies in the late 1980s and is now a primary theoretical tool for feminist and anti-racist scholars (Nash 2008). It emphasises the need to go beyond single analytical categories, such as gender, in the case of feminist researchers (Grabham et al. 2008). The concept of intersectionality means that each individual is constituted by interrelating axes of age, race, gender, class, sexuality and other identities. Intersectionality is an important analytical framework for understanding questions of inequality and injustice (Chap. 10; Hancock 2016). Such an approach explores relationships, social context, power relations, complexity, social justice and inequalities rather than a single vector of inequality or differences between separate analytical methods (McBride et al. 2014; Hopkins 2017). For instance, intersectionality can be used to analyse how gender and ethnicity interact to shape the multiple dimensions of female migrants' experiences of working in science, technology, engineering, and mathematics (STEM) fields.

From the perspective of multi-faceted axes of intersectionality, exclusion and segregation in urban China can be experienced by people who belong to multiple disadvantaged social identities. It can be based on gender, disability, age and *hukou*. It goes beyond the single aspect of differences in institutionalised household registration (*hukou*) and between geographical residential areas. For example, the experience of rural female migrant workers and older migrants may be different and varied. Figure 11.1 shows the intersectionality of multiple identities at the individual level, including *hukou*, ethnicity, language, occupation, education, age, sex and so on.

Multi-dimensional and intersectional segregation makes it harder to understand and assess segregation across urban China. Exclusion can increase stress and impact on the mental health and wellbeing of minority groups. This is especially true for rural migrants who are subject to multi-layered levels of interaction and segregation. Therefore, it is imperative for policy-makers, practitioners and researchers to raise awareness of how the intersectional needs of disadvantaged groups inter-connect. Existing literature overlooks these important factors. An intersectional perspective is necessary both to understand interactions between rural migrants and urban residents and the risks of segregation based on multi-layered identities of sources of disadvantage.

Fig. 11.1 Intersectionality of different identities at the individual level

Segregation and inequality at an individual level are often accompanied by varied forms of segregation among other groups in close relationship with rural migrants. A range of segregated groups may have strong intra-group interactions, contributing to complex multi-dimensional segregation and inequality in one geographical or organisational unit. The case study in this chapter examines the interactions between migrant care workers and older local residents in care homes in urban China. Figure 11.2 is a simplified diagram showing disadvantaged identities for both care workers, mainly low-paid female rural migrants and service users, such as older disabled people in urban care homes.

To explore how cutting-edge techniques might be employed to understand segregation in Chinese cities, we now explore the potential for SNA applications with critical reflections on the merits and limitations of the methods. In the following sections, we advocate the merits of social SNA in understanding segregation from

Fig. 11.2 Interactions of groups with different disadvantaged identities in care home settings

different perspectives. We identify the limitations of these methods in assessing segregation in urban China, illustrate the application of SNA in social care, and explore how to adjust the traditional SNA approach.

11.3 Social Network Analysis in Understanding Segregation

Social network analysis (SNA) is a quantitative approach that investigates network formation and relationships. It involves a matrix representation of the structures and patterns underlying social interactions, which is often depicted in graphical form using a ‘sociogram’ such as the one in Fig. 11.3 (Hanneman and Riddle 2005; Eiler et al. 2017). The SNA approach asserts that social life is rooted in the structure of social positions and relations between individuals. This necessitates an analysis of the way status and positions are distributed across social networks within groups and societies (Cott 1997). The basic form of SNA includes two elements: components (nodes) and interactions (ties) (Eiler et al. 2017; Wölfer and Hewstone 2017). Specifically, nodes are relevant subjects, which can include individuals or organisations, within a network, while ties are the interactions between those nodes in a social network. The SNA approach can be used to map and expose communication channels and information flow between individuals/groups within an organisation/network (Bae et al. 2015; Sabot 2017).

The application of SNA has been developed to illustrate social interactions between individuals or organisations, including organisational structure (Cross et al. 2013), healthcare systems (Bae et al. 2015; Eiler et al. 2017), occupational mobility

Fig. 11.3 The social network in Sunshine Care Home. *Note* white boxes: rural migrant care workers; blue boxes: urban care workers; blue circles: urban managers; lines: social ties; arrows: direct work relationships or friendships

(Demchenko 2011; Zhang and Wu 2017), and segregation within everyday activities (Zhao and Wang 2018). SNA helps identify nodes and the ties between individuals and groups and further illustrates interaction levels between individuals and/or organisations in specific settings. Figure 11.3 illustrates the social network estimated for our case study care home (further details on our approach below) where the boxes represent nodes/components (rural migrants and urban residents in different colours) and lines represent interactions (ties) between the nodes. This hypothesised social network figure could be used to explain the social interactions in an organisation or neighbourhood. The arrows represent connections between individuals: single arrows for one-way connections and double arrows for two-way connections. We focus on both types of connections between individuals and indirect connections through a mediator, such as #2 links the indirect connections between #1 and #23 in Fig. 11.3.

SNA is a useful tool for analysing social interactions between different groups in various settings. The structure of a social network includes relevant components and the patterns of interactions between these components. Analysis of the components and how they interact across the network can provide insight into how they relate to the broader community context, such as healthcare systems (Eiler et al. 2017). SNA can also investigate intergroup contact across social structures and explore means to promote social integration. It is an especially suitable 'fit' for research on segregation in Chinese cities.

SNA can help analyse how participants extend contact beyond direct connections by identifying internal connections and intergroup contacts. By analysing extended contact we can reflect indirect experience or establish the potential for intergroup contact. In Fig. 11.3, we can see that rural migrant #1 and #3 have no direct intergroup connection, but their mutually connected migrant #2 has ties linking with an urban resident #24. This allows #1 and #3 the indirect connection or potential for intergroup contacts argued by Wölfer and Hewstone (2017). The identification of direct and extended connections both within and between groups can provide contextual information across the entire social network. SNA has a particular strength as it identifies both direct and indirect links between network members, which could be used to analyse contextual information, potential relationships and integration.

A series of key Social Network Indicators have been deployed to measure social networks, such as homophily, density and closeness. The homophily principle highlights the importance of similarity in encouraging social network connections, which results in homogeneous personal networks in relation to a variety of demographic, socio-economic, behavioural, and intrapersonal characteristics (McPherson et al. 2001). Homophily suggests the contacts between dissimilar individuals and groups occur at a lower rate and dissolves at a higher rate than among groups of people with shared or similar characteristics (McPherson et al. 2001). Scholars have proposed a number of ways to measure the degree of homophily, such as the Pearson correlation coefficient of the degrees of adjacent nodes proposed by Newman (2002) as the 'simplest and most flexible' measure (Watts 2004; Dean and Pryce 2017). The density is measured with the ratio of m (edges observed) and m_1 (the number of edges of all nodes in the network) (White and Harary 2001; Dean and Pryce 2017).

Network closeness measures each node's proximity to all other nodes within the network by calculating the average shortest path to every other node (Okamoto et al. 2008).

Conventional applications of the SNA approach leave some questions unanswered around the underlying social mechanisms of segregation in increasingly diverse societies (Wölfer and Hewstone 2017). Current applications are dominated arguably by research on internet-based virtual space, although they seem to be less engaged with the actual urban built environment (Zhao and Wang 2018). While commonly used to examine residential segregation, SNA could also be applied to investigate social interactions in other non-residential settings. Zhao and Wang (2018) propose an integrated spatio-social network analysis approach to assess segregation in urban China, demonstrating a methodological shift beyond exclusively location-based measurements. They identified the limitations of segregation assessments based only on individualised domains such as housing or the workplace (see also discussion of domain segregation in Chap. 2). Their study also investigated social interactions between rural migrants and local residents in terms of everyday activities such as shopping and eating out in particular venues like restaurants, barber shops and pubs.

A more refined spatio-social network analysis tends to focus on the quantification of 'presence' or 'co-presence' of different groups at specific locations, but it still reveals few 'meaningful interactions' between those involved. Wölfer and Hewstone (2017) argue that propinquity (befriending with others who are physically close) is more influential than homophily (befriending those who share similar individual characteristics). However, proximity-based availability and presence do not necessarily contribute to higher degrees of integration between different groups. For example, local residents and rural migrants might go for lunch at the same restaurant without conversations or other forms of encounter. Within healthcare settings, Bae et al. (2015) argue that while many studies investigate social networks, structure and development, little has been done to investigate system effectiveness or care processes and patient outcomes. To provide a better understanding of segregation and inequality, it is imperative for SNA research to investigate more meaningful interactions and outcomes.

Also important is to consider alternative methods that can overcome the limitations of SNA and apply SNA analysis in a way that helps us acquire an in-depth understanding based on qualitative exploration. Future research could involve improved analysis of interactions between rural migrants and urban residents to better understand segregation in urban China. We propose two main ways to achieve this:

- I. To refine traditional SNA by including more social interaction analysis. Wölfer and Hewstone (2017) suggest that network ties be assessed with qualitative data from observations, interviews and documents in studies other than large-scale census analysis.
- II. To employ quantification via SNA alongside other research methods to gain a more robust understanding of the interactions between different groups and subsequent outcomes in terms of segregation and inequality.

Notwithstanding the potential richness and theoretical depth that SNA can bring to the research of intergroup connections and transfers, SNA has remained surprisingly underused in research on social segregation, particularly in China. Although Chinese scholars have adopted SNA in other fields, such as economic integration (Hou et al. 2009), supply chain (Borgatti and Li 2009) and organisation management (Li et al. 2011), the conceptual and methodological advantages of SNA remain largely unknown to researchers in segregation or integration studies (Wölfer and Hewstone 2017). At the same time, there is also room for improvement in terms of the level of technical sophistication as reflected in current studies on social segregation in China. By following recommendations on SNA use in health care studies proposed by Bae et al. (2015), future studies in segregation in Chinese cities could enhance the sophistication of research design, analysis, and assessments. Our case study on the segregation of rural migrant care workers in residential care homes in Shanghai, is intended to showcase how the SNA approach can be extended and triangulated with other methods. It is intended to demonstrate how different dimensions can be interwoven in practice, including age, gender migrants/locals segregation, and how cutting-edge techniques may help resolve complex multi-dimensional problems.

11.4 The Case of Migrant Care Workers in Shanghai

Care provision for older people is traditionally a primary responsibility of families in China (Qi and Dong 2018). Just like rural-urban disparities in other fields, care provision and finance for older people are provided differently in urban and rural areas in China. With dramatic demographic changes such as ageing, a decreasing fertility rate and internal migration, fewer adult children are available to provide care for their parents. The extended family still takes the main responsibility for care provision in both urban and rural China (Chen and Yang 2012). However, in developed urban areas, direct care is gradually changing to a combination of care by family members and paid care workers, mostly migrants from rural areas.

The domestic services market has grown rapidly in China since the mid-1990s (Connelly et al. 2018). The care labour market has also expanded since the 2000s in developed urban areas (Zhang 2018). With better economic outcomes and significant income growth, Chinese families have access to more resources to pay for care services (Connelly et al. 2018). This is especially true for urban dwellers. Paid care workers are increasingly employed in both residential care homes and at older people's own homes in urban China. In this context, care workers' employment becomes an alternative or supplement to familial care provision in urban China (Zhang 2018).

Due to significant differences in the economic background of urban and rural residents, two-tier welfare systems, and rural-urban migration, rural migrants comprise the majority of the care labour force in large Chinese cities. The majority of care workers in urban areas come from underdeveloped Western and Central Chinese provinces, such as Gansu, Hebei, Sichuan, Henan, Hubei, Guangxi (Wang

2012). In the care home in Guangzhou where Wang is the manager, only five of 60 care workers are local residents with *hukou* in Guangdong Province. This percentage represents the common composition for care labour in many Chinese cities. According to Connelly et al. (2018), around 15–20 million domestic service workers, mostly female rural migrants, take up paid domestic work in urban families, including cleaning, cooking, caring for children, older people, and patients.

11.4.1 Case Study Location and Data Collection

Shanghai, a typical metropolis with a relatively advanced care system, was selected as the case field for our research. In the context of a significantly ageing population and a developed economy, Shanghai has relatively advanced residential care homes and welfare institutions for older people. According to the Shanghai Civil Affairs Bureau (2018), there were 703 care homes with over 140,000 beds across the city in 2017. Rural migrant workers have increasingly taken up various service jobs in Shanghai, including care provision. Urban areas like Shanghai attract large numbers of migrant workers to maintain and develop care provision for older people.

Two public and one private care home were involved in this study. We collected secondary data such as administrative records from care homes to establish the composition of social networks among care workers at selected institutions. We used observational data and semi-structured interviews to explore the experiences and viewpoints of care home managers and migrant care workers. The aim was to monitor and evaluate interactions between migrant workers and their employers in order to gauge inequality and social integration levels.

To establish the characteristics of the social networks involved, we collected administrative data from three residential care homes about the management hierarchy, lines of staff accountability at different positions, demographic information, employment records, education and work experiences. We then conducted qualitative observational research in each care home to evaluate how staff at different levels interact with each other. Finally, three care home managers and eight migrant care workers took part in semi-structured interviews between 40 minutes and an hour and a half in length. Interviews focused on exploring experiences and viewpoints of geriatric care services, interactions between local and rural staff in the workplace, and the migrant care workers' daily routine and everyday life activities.

According to the administrative data, the majority (over 70%) of care workers from the three care homes were in their late 40s and 50s. Only five of 139 (3.6%) care workers were male. In each care home, we recruited one manager and three migrant care workers for interviews. All the interviewed migrant care workers were female, with ages ranging from 32 to 53. The interviews were conducted between April and July 2013. The authors translated extracts from respondents' narratives into English for the purpose of anonymised quotations. The names of organisations and interviewees in this chapter are pseudonyms.

11.4.2 Mixing SNA and Qualitative Methods in Examining Social Segregation

Using the SNA approach, this study classified managers and staff based on their occupational positions and *hukou*, to distinguish between locals and migrants. The process comprised a trial to combine a quantitative SNA approach with qualitative data from observation and interviews. The application of SNA gives the opportunity to show the macro picture of all relationships in the network. The in-depth interview data supported an understanding of the rationale behind the ties between individuals in the network and the differences in their relationships.

The network in our example consists of two sub-groups—rural migrants and urban residents. According to the administrative and observational data, there are 61 employees overall in Sunshine Care Home, with 19 locals (12 managers and seven care workers) and 42 rural migrant care workers. By identifying the job positions in the network, the study further classifies managers and care workers in the group of urban residents (blue nodes). As all rural migrants employed in the sampled care homes were care workers, there is no sub-category under the migrant nodes.

As shown in Fig. 11.3, collaboration and teamwork are occurring within the sample care homes, but the type and degree of these interactions differ between managers and care workers, and between urban citizens and rural migrants. Referring to key indicators of the measurement of social networks, the interactions between employees in the care homes show the importance of the homophily principle based on characteristics in *hukou* (i.e. contacts are at a higher rate within each group of migrants or locals than between two groups). This case study suggests that work relationships or collaboration within Shanghai care homes differ between rural migrants and local citizens with in-depth qualitative data. The main factor is the level of job position and division of labour. This finding echoes a 1997 study of a geriatric care facility in Toronto (Cott 1997). Cott used SNA research across long-term care multi-disciplinary teams and identified segregation and differences in teamwork between decision-makers and practitioners. In a similar pattern to that found in Toronto, collaborative teamwork among Shanghai care workers was limited to management-level professionals. Care workers' teamwork only consisted of assisting each other with work tasks with little team outputs. More importantly, the structure of the collaboration patterns and underlying interactions between each group will lead to a recurring circle that might trap migrant care workers at the caregiving level and not allow promotion to management positions.

The SNA approach could also be applied to interactions beyond the workplace, including migrant workers' daily activities in the community. In the selected Shanghai care homes, most rural migrant care workers lived in on-site accommodation provided by care homes. Most of them spent leisure time eating out and shopping with other migrant workers close to the care homes. Many care workers also helped older residents with shopping, as the nature of the job requires. These activities involve interactions with local residents or migrants working in other sectors beyond the isolated

care settings. It is recommended that SNA be applied beyond work-based measurement on the basis of the spatio-social network analysis focused on interactions at particular venues (Zhao and Wang 2018).

More importantly, rural migrant care workers experienced extended interactions with their own families and other connections in their hometown and interactions with residents of the care homes and their families. In this situation, rural migrant care workers mediate connections between urban and rural areas. Although these connections are very different for each individual, we cannot underestimate the potential for interaction and exchanges in the wider context. For example, Li, a female rural migrant in her 50s, managed to bring her daughter to study in a school in Shanghai with help from one older resident's son. Li suggested that it was a reward beyond the workplace based on the quality of care she provided to the residents.

Further SNA studies might extend our research to include further social interactions beyond the workplace or residential locations. The example shared by Li is uncommon for rural migrant care workers. Our interview and observational data suggest that interactions with care home residents cannot significantly reduce segregation in urban society. At the same time, there is an evident consensus that local older people living in care homes are also somewhat segregated from mainstream urban life. Their families only visit periodically, whether weekly, monthly or even less frequently. Segregation based on *hukou* and age is intertwined in care homes in Chinese cities.

The findings of our case study suggest that there is very low mobility across occupations for care workers, especially for those who are temporary migrants without local citizenship. There is very high mobility between jobs/institutions for care workers within the care industry as in other countries. Whatever their level of education, all the migrant workers rose no further than the position of basic care workers. The range included a primary school, secondary school, vocational education, and college and university graduates. In Sunshine Care Home, a group of younger migrant care workers from Jiangxi Province, who held college degrees in care management, had been working in the care industry for a few years. However, it was established that their educational level had not made a significant difference in their employment prospects for management positions in relation to the division between urban citizens or rural migrant.

We (rural migrants) are unable to reach a management level in the care industry in Shanghai. Everyone assumes locals are managers and migrants are care workers... As a rural migrant, I may try to move to a smaller care agency to find my chance to be a manager, but it will still be hard. I can see little chance for me to climb the promotion ladder in the care industry. I can only be a care worker, an experienced care worker, but not a manager.

Mei, rural migrant, 30s, female, with college degree

Segregation and inequality between locals and rural migrants are significant in the care labour market and the social welfare and employment rights of care workers. Care work, especially care for older people, is low paid with low social recognition or status in urban China. As Dong et al. (2017) argued, care workers who provide services to older people in Shanghai earned 20–28% less than those employed in

other service sectors involving similar human capital. Moreover, as the mobility of labour has gradually extended within China, the government has remained cautious about disconnecting welfare provision and *hukou* status (Connelly et al. 2018). This leads to difficulties for migrant workers to get access to welfare benefits and social services in urban areas.

11.5 Conclusion

In this chapter, we have explored the potential of social network analysis (SNA) for assessing and understanding social integration in contemporary Chinese cities. We illustrated this potential with an application to the relationships between care workers in the Sunshine Care Home in Shanghai. The SNA framework usefully revealed the structure of direct and indirect connections among local employees, migrant care workers and local older residents, and revealed how the spatial mix itself does not necessarily demonstrate the level of integration between different groups. Our study identified multi-dimensional segregation in care homes, including between rural migrants and local workers, age for older residents, and gender in care labour employment. These care homes are segregated islands in large Chinese cities, where women and rural migrants make up the majority of the workforce.

Recognising multi-dimensional segregation in the specific setting, this case study shows the importance of exploring age and gender segregation affecting rural migrants in urban settings in China. In Western contexts, age segregation has been discussed in cultural (Gullette 2004) and spatial (Kingman 2016) dimensions. In China, an increasingly large population of older people face the challenge of segregation and isolation from other generations who dominate key activities. Policy-makers and practitioners in China have paid little attention to the embedded problems in age-segregated space. This case study casts light on the investigation of multi-dimensional segregation occurring in real life. It asks for more attention to be given to diverse, vulnerable groups, or groups with multi-faceted vulnerable characteristics such as temporary migrants, female and older workers and older residents.

The SNA approach can be used to understand multi-dimensional segregation and inequality in settings which remain unexplored in China. For example, SNA could bring new insights into the investigation of encounters and interactions within inter-generational space (Jarrott et al. 2011; Vanderbeck et al. 2015). Specifically, further assessments can be built on such social network analysis in order to promote greater social and generational interaction. It could help identify which groups could benefit from these arrangements and how analysis and pilot schemes can be transformed to practice and policies across various settings, including work, communities and neighbourhoods, institutions and social care. At the macro level, an application of SNA that embraces the potential for interconnections between urban and rural areas will provide a more comprehensive understanding of segregation and inequality in China. It will also help identify the opportunities and problems inherent within rapid rural-urban migration.

Our study of the migrant care workers in Shanghai, albeit exploratory and anecdotal, also demonstrated the limitations of SNA. On the one hand, SNA offers a rich and potentially innovative analytical approach to characterise and examine the dynamic social integration process that occurs almost ubiquitously across large Chinese cities. Technically, there are also further opportunities to apply more advanced SNA statistical methods, such as exponential random graph models, which could be used to explain why some nodes in SNA are more likely to be connected than others (see e.g., Robins et al, 2007). On the other hand, there is a limit to how far SNA may fare by itself as just a technical exercise. In our case study of care homes in Shanghai, the intricacy and complexity revealed in the qualitative responses by migrant workers are conceivably beyond the range of what can be captured by SNA.

Indeed, the key intellectual question is perhaps more conceptual than methodological, revolving around the very definition of ‘integration’ within present-day urban China, a social context which is, in many ways, very different from its Anglo-American counterpart (Zhao and Wang 2018; see also Chaps. 4 and 15). In other words, although SNA can be employed to characterise the *prima facie* structure of social integration, the intellectual strength of SNA may only manifest itself in full when accompanied by theoretical insights generated from qualitative investigation.

In a nutshell, we call for a mixed-methods approach towards applying social network analysis to characterise continuing social integration between rural migrants and urban residents in contemporary China. Our future research will aim to progress in a corresponding direction, especially by focusing on the more informal and ‘everyday life’ aspects of social interaction (e.g., via shopping or commuting) to inform social policies to encourage more routine exchanges between the locals and the migrants.

References

- Bae S-H, Seo JY, Castner J (2015) Health care provider social network analysis: a systematic review. *Nurs Outlook* 63(5):566–584. <https://doi.org/10.1016/j.outlook.2015.05.006>
- Blau PM (1960) A theory of social integration. *Am J Sociol* 65(6):545–556. <https://doi.org/10.1086/222785>
- Borgatti SP, Li X (2009) On social network analysis in a supply chain context*. *J Supply Chain Manag* 45(2):5–22. <https://doi.org/10.1111/j.1745-493X.2009.03166.x>
- Brissette I, Cohen S, Seeman TE (2000) Measuring social integration and social networks. *Social support measurement and intervention: a guide for health and social scientists*. Oxford University Press, New York, pp 53–85
- Chen Z, Liu K (2018) Assimilation of China’s rural-to-urban migrants: a multidimensional process. *Chin J Sociol* 4(2):188–217. <https://doi.org/10.1177/2057150X18764232>
- Chen L, Yang DL (2012) Old age care concerns and state-society relations in China: public anxiety and state paternalism. *J Asian Pub Policy* 5(2):136–154. <https://doi.org/10.1080/17516234.2012.678743>
- Connelly R, Dong X-Y, Jacobsen J, Zhao Y (2018) The care economy in post-reform China: feminist research on unpaid and paid work and well-being. *Fem Econ* 24(2):1–30. <https://doi.org/10.1080/13545701.2018.1441534>

- Cott C (1997) "We decide, you carry it out": a social network analysis of multidisciplinary long-term care teams. *Soc Sci Med* 45(9):1411–1421. [https://doi.org/10.1016/S0277-9536\(97\)00066-X](https://doi.org/10.1016/S0277-9536(97)00066-X)
- Cross R, Kaše R, Kilduff M, King Z (2013) Bridging the gap between research and practice in organizational network analysis: a conversation between Rob Cross and Martin Kilduff. *Hum Resour Manag* 52(4):627–644. <https://doi.org/10.1002/hrm.21545>
- Dean N, Pryce G (2017) Is the housing market blind to religion? A perceived substitutability approach to homophily and social integration. *Urban Stud* 54(13):3058–3070. <https://doi.org/10.1177/0042098016668779>
- Demchenko O (2011) Social network and occupational mobility: a mathematical model. *Soc Sci Q* 92(4):1118–1132. <https://doi.org/10.1111/j.1540-6237.2011.00806.x>
- Dong X-Y, Feng J, Yu Y (2017) Relative pay of domestic eldercare workers in Shanghai, China. *Fem Econ* 23(1):135–159. <https://doi.org/10.1080/13545701.2016.1143108>
- Eiler BA, Bologna DA, Vaughn LM, Jacquez F (2017) A social network approach to understanding community partnerships in a nontraditional destination for Latinos. *J Commun Psychol* 45(2):178–192. <https://doi.org/10.1002/jcop.21841>
- Fan CC (2002) The elite, the natives, and the outsiders: migration and labor market segmentation in Urban China. *Ann Assoc Am Geogr* 92(1):103–124. <https://doi.org/10.1111/1467-8306.00282>
- Fischer CS (2011) Still connected: Family and friends in America since 1970. Russell Sage Foundation.
- Fredericks KA, Durland MM (2005) The historical evolution and basic concepts of social network analysis. *New Dir Eval* 2005(107):15–23. <https://doi.org/10.1002/ev.158>
- Grabham E, Cooper D, Krishnadas J, Herman D (2008) Intersectionality and beyond: Law, power and the politics of location. Routledge
- Gu S (1992) Two types of population migration in China: a comparative study. *Chin J Popul Sci* 4(1):75–84
- Gullette MM (2004) Aged by culture. UP of Chicago, Chicago
- Hancock A-M (2016) Intersectionality: An intellectual history. Oxford University Press
- Hanneman RA, Riddle M (2005) Introduction to social network methods. University of California, Riverside, CA
- Hopkins P (2017) Social geography I: Intersectionality. *Prog Hum Geogr*. <https://doi.org/10.1177/0309132517743677>
- Hou Y-H, Liu Z-B, Yue Z-G (2009) Social network analysis over the process of economic integration in the Yangtze River Delta. *China Soft Sci* 12:90–101
- Jarrott SE, Kaplan MS, Steinig SY (2011) Shared sites: avenues for sharing space, place, and life experience across generations. *J Intergenerational Relationsh* 9(4):343–347. <https://doi.org/10.1080/15350770.2011.619919>
- Kilduff M, Tsai W (2003) Social networks and organizations. SAGE Publications Ltd, London
- Kingman D (2016) Generations apart: the growth of age segregation in England and Wales. Intergenerational Foundation, London
- Li Y, Lu Y, Kwak YH, Le Y, He Q (2011) Social network analysis and organizational control in complex projects: construction of EXPO 2010 in China. *Eng Proj Organ J* 1(4):223–237
- McBride A, Hebson G, Holgate J (2014) Intersectionality: are we taking enough notice in the field of work and employment relations? *Work Employ Soc* 29(2):331–341. <https://doi.org/10.1177/0950017014538337>
- McPherson M, Smith-Lovin L, Cook JM (2001) Birds of a feather: homophily in social networks. *Ann Rev Sociol* 27(1):415–444. <https://doi.org/10.1146/annurev.soc.27.1.415>
- Musterd S, Ostendorf W (1998) Urban segregation and the welfare state: inequality and exclusion in western cities. Routledge, London
- Nash JC (2008) Re-thinking intersectionality. *Fem Rev* 89(1):1–15. <https://doi.org/10.1057/fr.2008.4>
- National Bureau of Statistics of China (2019) 2018 monitoring and evaluation report of rural migrants. In 2018 nian nongmingong jiance diaocha baogao. http://www.stats.gov.cn/tjsj/zxfb/201904/t20190429_1662268.html

- Ndofor-Tah C, Strang A, Phillimore J, Morrice L, Michael L, Wood P et al (2019) Home office indicators of Integration framework 2019. Home Office, London
- Newman MEJ (2002) Assortative mixing in networks. *Phys Rev Lett* 89(20):280710. <https://doi.org/10.1103/PhysRevLett.89.208701>
- Okamoto K, Chen W, Li X-Y (2008) Ranking of closeness centrality for large-scale social networks. In: *International Workshop on frontiers in algorithmics*. Springer, pp 186–195
- Phillips NE, Levy BL, Sampson RJ, Small ML, Wang RQ (2019) The Social integration of American cities: network measures of connectedness based on everyday mobility across neighborhoods. *Sociol Methods Res* 0049124119852386. <https://doi.org/10.1177/0049124119852386>
- Piekut A, Pryce G, van Gent W (2019) Segregation in the twenty first century: processes, complexities and future directions. *Tijdschrift Voor Economische En Sociale Geografie* 110(3):225–234. <https://doi.org/10.1111/tesg.12355>
- Putnam RD (2000) *Bowling alone: The collapse and revival of American community*. Simon and schuster.
- Qi L, Dong X-Y (2018) Gender, low-paid status, and time poverty in urban China. *Fem Econ* 24(2):171–193. <https://doi.org/10.1080/13545701.2017.1404621>
- Robins G, Pattison P, Kalish Y, Lusher D (2007) An introduction to exponential random graph (p*) models for social networks. *Soc Netw* 29(2):173–191. <https://doi.org/10.1016/j.socnet.2006.08.002>
- Sabot K, Wickremasinghe D, Blanchet K, Avan B, Schellenberg J (2017) Use of social network analysis methods to study professional advice and performance among healthcare providers: a systematic review. *Syst Rev* 6(1):1–23. <https://doi.org/10.1186/s13643-017-0597-1>
- Sampson RJ, Raudenbush SW, Earls F (1997) Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science* 277(5328):918. <https://doi.org/10.1126/science.277.5328.918>
- Scott J (1988) Social network analysis. *Sociology* 22(1):109–127. <https://journals.sagepub.com/doi/10.1177/0038038588022001007>
- Seeman TE (1996) Social ties and health: the benefits of social integration. *Ann Epidemiol* 6(5):442–451. [https://doi.org/10.1016/S1047-2797\(96\)00095-6](https://doi.org/10.1016/S1047-2797(96)00095-6)
- Shanghai Civil Affairs Bureau (2018) Report on conducting ‘The review outcomes of motion delivered to the Judicial Committee of the Shanghai Municipal People’s Congress by the 1st Meeting of the Fifteenth Shanghai Municipal People’s Congress’. Shanghai Civil Affairs Bureau, Shanghai
- Sun C (2000) The floating population and internal migration in China. In: Peng X, Guo Z (eds) *The changing population of China*. Blackwell Publishers, Oxford, pp 179–191
- Umberson D (1987) Family status and health behaviors: social control as a dimension of social integration. *J Health Soc Behav* 28(3):306–319. <https://doi.org/10.2307/2136848>
- Vanderbeck RM, Worth N, Worth N (2015) *Intergenerational space*. Routledge studies in human geography, vol 50. Routledge, New York, NY
- Wang G (2000) The distribution of China’s population and its changes. In: Peng X, Guo Z (eds) *The changing population of China*. Blackwell Publishers, Oxford, pp 11–21
- Wang YP, Wang Y, Wu J (2009) Urbanization and informal development in China: urban villages in Shenzhen. *Int J Urban Reg Res* 33(4):957–973. <https://doi.org/10.1111/j.1468-2427.2009.00891.x>
- Wang Z, Zhang F, Wu F (2016) Intergroup neighbouring in urban China: implications for the social integration of migrants. *Urban Stud* 53(4):651–668. <https://doi.org/10.1177/0042098014568068>
- Wang S (2012) Thoughts on the shortage of elderly carers. In: Paper Presented at The 2nd international Leadership Assembly of Nursing Homes & Apia-Tsao-Ilc Symposium On Active Ageing, Hong Kong
- Watts DJ (2004) The “new” science of networks. *Ann Rev Sociol* 30(1):243–270. <https://doi.org/10.1146/annurev.soc.30.020404.104342>
- White DR, Harary F (2001) The cohesiveness of blocks in social networks: node connectivity and conditional density. *Sociol Methodol* 31(1):305–359. <https://doi.org/10.1111/0081-1750.00098>

- Wölfer R, Hewstone M (2017) Beyond the dyadic perspective: 10 reasons for using social network analysis in intergroup contact research. *Br J Soc Psychol* 56(3):609–617. <https://doi.org/10.1111/bjso.12195>
- Yao J, Wong DWS, Bailey N, Minton J (2019) Spatial segregation measures: a methodological review. *Tijdschrift Voor Economische En Sociale Geografie* 110(3):235–250. <https://doi.org/10.1111/tesg.12305>
- Zhang W (2018) *Home care for older people in urban China: an analysis of the marketisation process*. University of Bristol, Bristol
- Zhang Z, Wu X (2017) Occupational segregation and earnings inequality: rural migrants and local workers in urban China. *Soc Sci Res* 61:57–74. <https://doi.org/10.1016/j.ssresearch.2016.06.020>
- Zhao M, Wang Y (2018) Measuring segregation between rural migrants and local residents in urban China: An integrated spatio-social network analysis of Kecun in Guangzhou. *Environ Plan B: Urban Anal City Sci* 45(3):417–433. <https://doi.org/10.1177/2399808317710658>

Open Access This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.