The Spatio-Temporal Characteristics of Residential Migration of New Citizens in Guangzhou

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Abstract. Internal residential migration within a city can not only reflect the spatio-temporal patterns of individual/family relocation behaviors, but also serve as an effective tool for interpreting the social-spatial differentiation of the city from a microscopic perspective. The new citizen group constitutes a vast migrating population in China. This study selects the megacity of Guangzhou as the research area and utilizes the data from the "Questionnaire on Residential Migration of New Citizens in Guangzhou" conducted in 2023. By employing methods such as the spatio-temporal system and spatio-temporal path visualization in time geography, it explores the spatio-temporal paths of residential migration of new citizens in Guangzhou. The research findings indicate that new citizens in Guangzhou frequently migrate across districts without significant agglomeration or diffusion phenomena. However, there are substantial differences in the residential location choices of new citizens with different educational backgrounds. This paper provides a basis for formulating relevant policies in Guangzhou's urban planning to promote the new citizen group to live and work in the city contentedly and to drive the high-quality development of the city.

Keywords: residential migration; new citizens; Spatio-temporal paths; Guangzhou

1 Introduction

Since the reform and opening up, China's urbanization has been developing at a high speed continuously. The urbanization rate increased from 36.2% in 2000 to 65.2% in 2022, and the urban population has grown rapidly. Moreover, the newly added population is mainly composed of rural-urban migrants. Entering the new era, high-quality development has become the primary task for China to comprehensively build a socialist modern country.[1] While the urbanization rate is at a historical high, the urbanization of migrant workers has been raised to a new level. The people-centered urbanization, especially the urbanization of new citizens, has increasingly become a new theme. The report of the 20th National Congress of the Communist Party of China proposed: "Promote people-centered new urbanization and accelerate the urbanization of rural-urban migrants", "Adhere to the principle that houses are for living in, not for speculation, and accelerate the establishment of a housing system with multi-subject

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supply, multi-channel guarantee, and simultaneous development of rental and purchase."[2] In 2021, the term "new citizens" first appeared in the "Report on the Work of the Government" of the State Council, which clearly stated that "every effort should be made to help new citizens, young people and others alleviate their housing difficulties". New citizens are the fresh blood in the urban system and also the group with the fastest scale expansion and the greatest development potential during the urbanization process, making important contributions to promoting China's urban economic development.[3]

As an important component of urban space, population is the most active factor in urban development. The evolution of urban space is often accompanied by the residential migration of the population, which is manifested as the population flow within the urban geographical scope to meet housing demands by adjusting residential locations. [4] In addition to building more housing for the large number of new citizens, Guangzhou must also provide sufficient public services and infrastructure, which poses a huge challenge to the urban planning and construction of Guangzhou. Therefore, it is necessary to conduct systematic research on the characteristics and patterns of new citizens' residential migration to provide a basis for the healthy and high-quality development of the city.

2 Research Background and Significance of Residential Migration in Large Chinese Cities

The relocation behaviors of urban residents in China are not completely determined by internal family factors, but are significantly influenced by a series of macro-external factors, including changes in housing policies, fluctuations in the real estate market, and urban renewal. The following are the specific impacts of these macro factors on urban relocation trends: In the early stage of reform and opening up, with the transformation of the national economic system, the traditional danwei (work unit) system and danwei compounds began to disintegrate, enhancing the mobility of urban residents. Nevertheless, the work unit still played a central role in housing supply, resulting in most residents' relocation behaviors being passive; with the policy allowing migrant workers to enter cities and the initial formation of the housing and land markets, housing shifted from a welfare nature to commercialization, and residential areas outside the work units increased rapidly, and residents' residential migration began to tend towards autonomy. However, due to the accumulation of long-term low wages, the number of people who could afford commercial housing on the market was limited, so the scale of active relocation was not large; since the 21st century, the urban real estate market has further developed and matured, and developers have gradually replaced work units as the dominant force in housing supply, and residents' relocation behaviors have become more spontaneous and autonomous. Meanwhile, the advancement of urban expansion, new city construction, and old city renovation has led to a large influx of migrant populations into cities and frequent relocations.[5] Coupled with land requisition and demolition, urban relocation phenomena have become more complex; in the new era background of slowed economic development, reduced spatial expansion, stable population growth, and slowed residential develop-

ment and demolition resettlement speeds, a relatively stable stock housing market has gradually formed within cities, and active relocation has become the main form of urban residential migration.[6]

Against this background, this paper, based on the data of the Questionnaire on Residential Migration of New Citizens in Guangzhou, focuses on the growing and increasingly differentiated new citizen groups within the city. Mainly because their relocation has an important impact on the city's social and economic development[7]. Their relocation not only affects the city's population structure but may also bring new labor and consumption demands, promoting economic growth, and can more reflect the regular characteristics of new citizens' internal relocation within the city according to their needs and wishes[8]. On the basis of sorting out the overall spatio-temporal characteristics of the residential migration of the sample group, this paper attempts to find common laws among differentiated social groups, individualized relocation reasons, and complex relocation paths, comprehensively identify and quantitatively describe the typical residential patterns of new citizens in Guangzhou, explore the deepening paths and paradigm innovation of research on residential migration in large Chinese cities in the new era, and provide a theoretical basis and practical foundation for interpreting and prospectively predicting the process of urban social space differentiation from the demand side.[9]

3 Materials and Methods

3.1 Study Data

This paper mainly employs questionnaire survey data. The research methodology for data collection was determined to be carried out both online and offline based on the characteristics of the research objects. Online, it was mainly conducted through the "Wenjuanxing" survey platform (www.wjx.cn). Offline, a combination of area quota sampling and random sampling was adopted. A quota framework was established according to the number of permanent residents in each urban district. During the period from June 2023 to June 2024, a random sampling questionnaire survey was carried out across the city of Guangzhou targeting new citizens with stable employment in Guangzhou. The survey content covered the social attributes, family attributes, economic attributes, and housing attributes of the new citizens, as well as their relocation situations during the period from 2010 to 2024. In total, more than 400 questionnaires were distributed, and 281 valid questionnaires with complete information were obtained. The basic information of the survey samples is shown in Table 1.

Table 1. Sample profile

Attributes	Categories	Frequency	Proportion(%)
Gender	Male	136	48.4
	Female	145	51.6
Marital Status	Married	34	12.1
	Unmarried/Others	247	87.9

Education Level	High school and below	165	58.7
	Undergraduate	96	34.2
	Postgraduate and above	20	7.1
Employment Status	Full-time	197	70.1
	Flexible employment	66	23.5
	Never employed	11	3.9
	Others	7	2.5
Monthly Income	0-5000	98	34.9
	5000-10000	162	57.6
	Above 10000	21	7.5
Housing Ownership	Owner-occupied	94	33.5
	Others	187	66.5
Residential Location	Central urban area	176	62.6
	Peripheral urban area	105	37.4

3.2 Study Method

The spatio-temporal path is a fundamental concept and tool in time geography. It serves as an effective framework for analyzing individual activity participation and activity opportunity constraints, and is frequently used to record the trajectories of individuals' daily activities or residential migrations in time and space. The spatio-temporal path is a trajectory in a three-dimensional space jointly constituted by a spatial coordinate point in a two-dimensional geographical plane and a point on the time axis. [10]This paper utilizes Arc GIS software and the Space Time Path plug-in to visualize the spatio-temporal paths of individual residential migrations.

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Figure 1 presents more explicitly the cross-district migration flows of different educational levels in Guangzhou. It can be found that for those with a high school education or below and those with a postgraduate degree or above, their locations before relocation are mostly concentrated in the central urban area, while their locations after relocation are mostly concentrated in the peripheral urban area. At the same time, there are also a certain number of migrations within the central urban area. For undergraduates, there are relatively large numbers of relocations both between the central urban area and the peripheral urban area and within the central urban area.

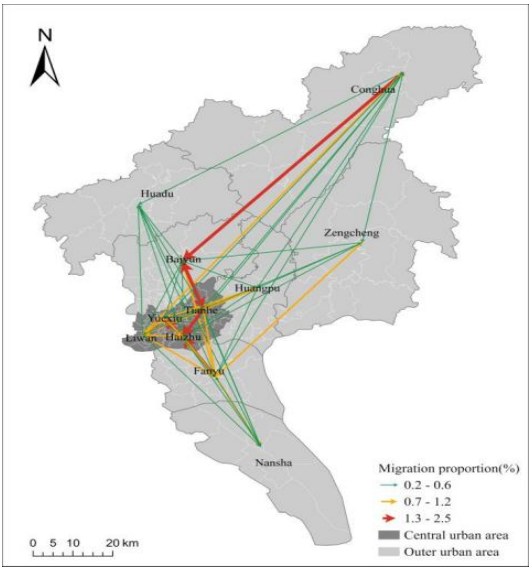

Fig. 1. Cross-district Migration Flows of New Citizens in Guangzhou

By simplifying the geographical space of Guangzhou into a two-dimensional plane and taking the age at the time of relocation as the z-axis, a three-dimensional residential trajectory map is constructed, as shown in Figure 2. It presents the spatio-temporal paths of residential migration of new citizens in Guangzhou at the street scale based on educational attainment levels. Generally, the new citizen group in Guangzhou exhibits relatively strong mobility, and the phenomenon of residential migration gradually becomes more frequent with age starting from 20 years old.

The spatio-temporal paths of relocation of residents with different educational backgrounds, covering the starting age and direction of relocation, differ significantly. This is closely related to the institutional framework of the housing market, the urban spatial layout, and the occupation types of people with different educational backgrounds. Among them, the relocation rate of the group with a high school education or below is slightly higher than that of the group with a postgraduate degree, but the gap between the two is much smaller than the impact caused by differences in life events. This result is in stark contrast to the situation where local residents in Guangzhou with a higher educational level have a greater probability of relocation. The root cause lies in the difference in relocation motives between the floating population and local residents. Some families in Guangzhou, especially young families with high educational attainment, relocate mainly to pursue high-quality educational resources; whereas new citizens relocate mostly due to fluctuations in rent and changes in employment. On the one hand, new citizens, newly entering society, have a weak economic foundation. Facing the continuous rise or excessive pressure of rent, they are compelled to move in order to find a residence that conforms to their economic conditions. On the other hand, new citizens have a shallow understanding of their career interests and plans, lack practical experience and core skills, are less competitive in the labor market, and have

poor job stability. They often experience changes in residence due to frequent job changes.

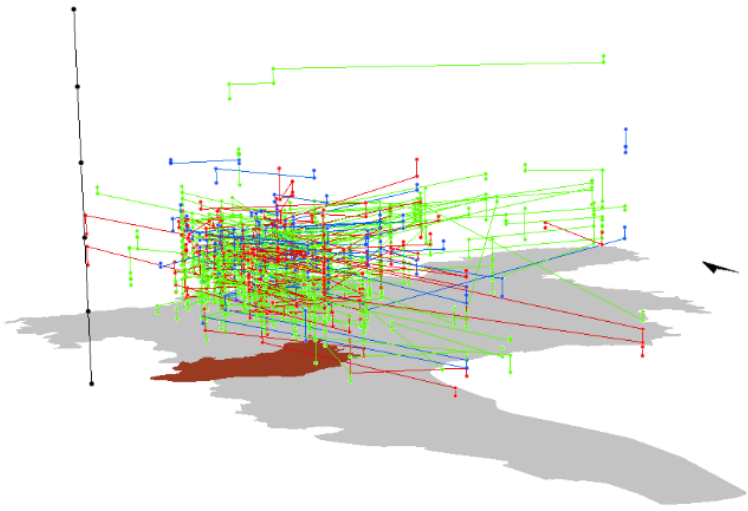

Fig. 2. Spatio-temporal Paths of Residential Migration of New Citizens in Guangzhou

5 Conclusions

Based on the "Survey on Residential Migration of New Citizens in Guangzhou" initiated in 2023, this paper analyzes the spatio-temporal characteristics of the residential migration of new citizens by employing the spatio-temporal path visualization method in time geography. The research indicates that the residential migration of new citizens occurs rather frequently, with cross-district migrations being predominant. However, new citizens with different educational backgrounds exhibit markedly diverse spatio-temporal characteristics during the residential migration process.

This paper combines the research on residential migration with that of new citizens. At present, new citizens have become a vast migrating group in China, and housing is the primary issue they need to address after entering the city. Investigating the relocation behaviors of new citizens can provide theoretical and scientific support for improving the urban housing system, contribute to a profound understanding of urban population flow from a microscopic perspective, and offer a basis for precisely matching housing, transportation, and industrial layouts in urban planning, thus enhancing urban space utilization efficiency and talent attraction. Future research could incorporate more long-term tracking survey data and consider the dynamic changes in urban regional development to explore the dynamic mechanism between residential migration and urban development.

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