

Research on Social-spatial Effects Caused by Residential Differentiation : Case Study of Typical Communities in Xi'an City

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Abstract. Combining the evaluation results of questionnaire and remote sensing image, the study evaluate the social-spatial effects of residential differentiation from the micro perspective of residents and the macro perspective of city in a qualitative and quantitative manner. The social-spatial effects are mainly manifested in improving the targeting of community services, hindering interaction between social groups, endangering public safety, exacerbating the unbalanced pattern of public resource and the differences in job-housing balance .

Keywords:Residential differentiation, Social-spatial effects, Xi'an.

1. Introduction

Simonsen argues that space is not only the physical environment of society, but that spatial differentiation will also affect social life, and that space itself is part of the urban social process [1]. As a basic component of urban space, residential differentiation will inevitably have an impact on urban development, both positive and negative effects. These effects are not only the direct results of residential differentiation, but also an important way to improve and optimize residential space. Foreign countries often treat the effect of residential differentiation as a "problem" [2], Morris believes that the gathering of unemployed people reduces communication opportunities and prevents access to employment information [3], and the next generation of poor people find it more difficult to integrate into the mainstream of society, resulting in the emergence of problem areas [4]. The gathering of poor people leads to a lack of facilities and loss of development opportunities, resulting in a gradual deterioration of the environment[5]. The emergence of slums is seen as a disregard for vulnerable groups by mainstream society[6]. Conversely, some scholars have argued that residential differentiation has its positive social effects. Spatial differentiation facilitates the social interaction of small groups [7]. Under the relationship of "Social Network", homogeneous people get benefits through information exchange, such as cheap goods and job information. "Ethnic Entrepreneurs" exist among ethnic groups, Chinatown is often the first choice for Chinese to find social connections. Charles found that people of colour tend to live with people of the same ethnicity [8] and overseas Chinese and Southeast Asians generally tend to gather in Canadian cities [9].

The domestic evaluation of the effects of residential differentiation involves low-income population living space, gated communities, affordable housing communities, jiaoyufication, etc. Social problems such as residential segregation and resource deprivation exist in the gathering of low-income groups [10]; Closed communities has social risks such as hindering class interaction and affecting social equity [11]; Jiaoyufication has negative effects such as unfair distribution of service facilities, hindering social mobility and giving rise to real estate speculation [12]; some argue that residential differentiation had positive effects such as eliminating the market backlog and satisfying the needs of different groups, and negative effects such as increasing residential segregation and deprivation of spatial resources [13].

The geographic view is that things are universally connected, and things in close spatial proximity are more closely connected [14]. The spatial differences caused by residential differentiation are also in line with this law. This paper takes different types of communities as the research object, use spatial analysis and questionnaire survey to analyze the social-spatial effect.

2. Study Area

As an important central city in the west, Xi'an has carried out a lot of exploration and practice in community construction. This paper divides communities into five types, including high-grade community dominated by villas, such as Qujiang Mansion and Salamanca; mid-high grade community dominated by apartments, such as Tangyan Mansion and Hairong International; middle-grade community dominated by commercial housing, such as Wanhua Court and University Village; mid-low grade community dominated by affordable housing, such as Chang'an Park and New North Residence; low-grade community dominated by villages in cities, such as Xibali and Huodian (Figure 1). These communities have different house prices, location attribute, completion time, residential groups or property costs, and surrounded by communities of different types. The questionnaire was randomly distributed and in-depth interviews were conducted among residents of different occupational types, income levels, and education levels. Finally, 856 valid questionnaires were finally collected.

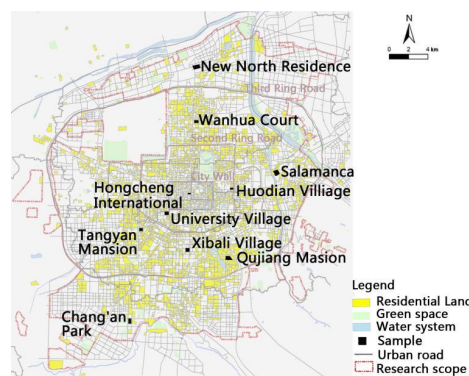


Figure 1. Spatial distribution of the cases

3. Social-spatial Effects Caused by Residential Differentiation

3.1 Improve the targeting of community services

The satisfaction of community services shows that 38.7% of the residents are "satisfied", 51.2% are "generally satisfied" and 10.1 % are "not very satisfied". The majority of residents are satisfied with the organization and management of the community. This shows that most residents agree with the way the community is organized and managed, and this agreement helps to create a sense of belonging to the community. When answering whether they would like to live in their community, 46.1% of the residents chose "very willing" and 12.4% chose "not willing". More than 85% of residents in different types of residential areas chose "comfortable" as their sense of belonging to the community.

If community services are compared to consumer goods, then the consumption behaviour for community services will be constrained by the consumers themselves as well as by external factors(Figure 2). The consumption behavior of consumers in the same social class is similar, and different social classes have different behavioral motives and tendencies such as lifestyles and consumption levels, and their requirements for community services, fees and activities are also very different. Moderate residential differentiation allows residents living in the same community to have basically similar interpersonal relationships, behavioral characteristics, and values, which reduces inter-group conflict and constitutes a distinct and stable community subculture. Similarities

in consumer behavior exist among consumers of the same class, which helps to enhance identity and establish community roles. Therefore, different community management strategies are adopted for different types of communities, and different activities adapted to residents' needs are carried out: high-grade communities can rely on homeowners' committees to develop community culture, while low-grade communities should do a better job of alleviating poverty and providing jobs.



Figure 2. Community services and community belonging

3.2 Hider the communication between social groups

Neighborhood interactions were evaluated in relation to residents' length of residence, place of residence, and social status. The results of the evaluation of residents in different types of neighborhoods show that low-grade neighborhoods have the highest level of 48.3%, due to the fact that neighborhood residents are familiar with each other for several generations and often help each other. In contrast, high grade neighborhoods have the lowest level of 19.4% because of less free time and less in-depth neighborhood interactions. While 21.3% in mid-low grade communities, because long commute has taken up their communication time.

Neighborhoods in unitary communities, like University Village, are built on the basis of "units", with living and production spaces concentrated in the same "territory", forming "geopolitical" and "industrial" neighborhoods. Although the original units have been restructured and the community members have changed, the long-formed sense of the unit compound still has a profound impact on neighborhood relations. Most of the older residents are employees of the same units with children who have made their homes elsewhere, leading this group to become more dependent on community neighbourhood.

Within mid-high to high-grade communities, neighborhoods rely more on identity or the same interests. For example, the neighborhood relationship of Qujiang Mansion relies on the identity of the owners of the upscale community that is generated by the boundary of walls, and the occupations are relatively dispersed. When living space becomes an important symbol of personal identity and status, this spatialized property reflects its exclusivity and exclusion through facilities such as access control and security, and this common way of life promotes the generation of a sense of community belonging and neighborhood identity.

In the case of low-grade communities, which themselves have little contact with each other because of their different workplaces, the social activity distance hinders communication between heterogeneities. Segregation between communities and neighbourhood leads to increasing homogeneity and less interaction between members. Closed living, lack of communication, unwillingness to socialise with other classes tend to create an "island effect", resulting in a vicious circle of "closure - inferiority" (Figure 3). The migration into cities, the citizenization of rural population and the suburbanization cause the recombination of community members. The breakage of social network and the lack of capital can cause the material and spiritual problems of low-income class.

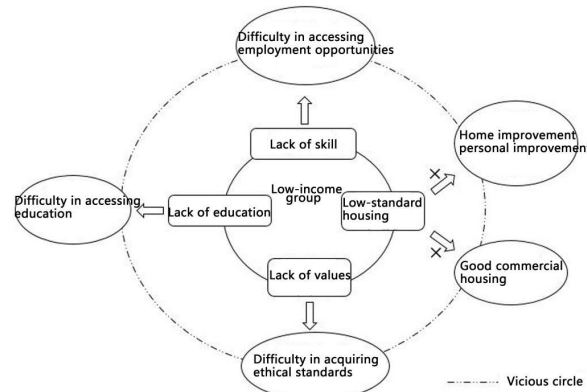


Figure 3. Vicious circle of poverty

3.3 Endanger public safety and social stability

Community safety is the foundation of social stability. In the process of renovation of old cities in central areas and construction of subsidized housing in marginal areas, decaying communities are easily left behind or created. The satisfaction with community security can be seen in community different types varies widely, with the percentage of high-grade and mid-high communities considering themselves satisfied at over 75 %, while the percentage of mid-low and low-grade communities considering themselves satisfied with community security is only about 25% (Figure 8). The results on satisfaction with the quality of community residents likewise show that the percentage is above 45% in high-grade and mid-high communities, and the percentage of those who are dissatisfied is around 15% in mid-low communities. The high number of rental housing in low-grade communities where vulnerable groups are located increases the amount of population movement, and the renters are mostly engaged in simple manual labor and are not highly educated, making property management more difficult and prone to the formation of problematic communities.

3.4 Unbalanced pattern of public service facilities

Public service facilities are defined as facilities to ensure urban functions and social management, this paper take education, medical care, and commerce as an example. Kernel density analysis method in ArcGIS is used to show the aggregation degree of different facility service [15].

Education facilities are mostly located within the second ring, with the highest density in the central and south(Figure 4). There is a high degree of imbalance in educational facilities between regions, and the development of education in the suburbs does not meet the needs of residents. In terms of satisfaction with educational facilities, up-grade and mid-high communities are the most satisfied with educational support, while mid-low and low-grade communities are the most dissatisfied with . Small number of public schools and high fees of private schools have become the main problems plaguing the vulnerable groups.

Medical facilities are divided into clinics and general hospitals. The distribution of medical facilities in Xi 'an indicates that the density of the central city is the highest, followed by the south and east. Of the 23 tertiary hospitals serving the whole country and undertaking the functions of a national medical center, 14 are located within the second ring, with abundant medical resources, and only one outside the third ring (Figure 5). Satisfaction with medical facilities is highest in high-grade communities, dissatisfaction is highest in mid-grade communities, and satisfaction with medical service facilities is predominantly average in all types of communities. The vulnerable groups are limited by their residential location away from the city center and have a lower level of accessibility to quality health care facilities.

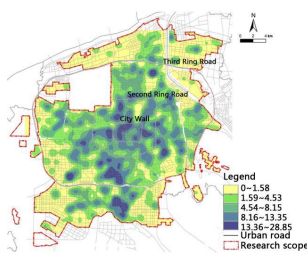


Figure 4. Spatial distribution density of education facilities

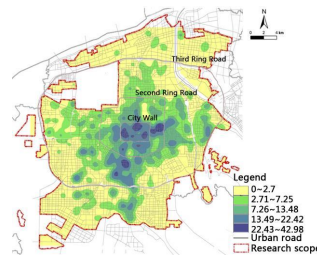


Figure 5. Spatial distribution density of medical facilities

Commercial facilities are divided into catering services, shopping services, living services and health care services. The central city and High-tech zone in the southwest have the highest density. Most of the commercial facilities are close to the center of the traffic routes, and the overall distribution shows a phenomenon of being largely scattered but partially concentrated, with the east-west commercial axis of High-tech zone- Zhonglou Happy Forest Belt and the north-south commercial axis of Qujiang-Xiaozhai-Xujiawan having been formed, while the density of facilities in the east and the north are on the low side (Figure 6). From the satisfaction of different communities on commercial facilities, it can be seen that the satisfaction degree is all about 30 %, and the general attitude of residents in various communities is about 50 %,the low-grade communities have the highest levels of dissatisfaction.

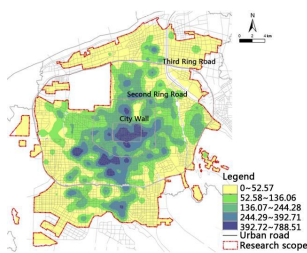


Figure 6. Spatial distribution density of commercial facilities

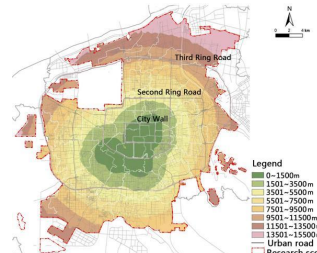


Figure 7. Commuting distance

3.5 Differences in job-housing balance and commuting efficiency

As a result of high housing prices in the central city and the suburbanization of government resettlement, vulnerable groups are forced to move to the urban periphery. In the adjustment of the industrial structure, the service industry is more concentrated in the central area, and the jobs in the urban fringe are insufficient, resulting in a mismatch between residential space and employment space. According to Xie, 2021, the employment density in the central is mostly above 1.2, while in the suburbs is around 0.05 [16]. Commuting distance for the middle and low income classes living in the suburbs is mostly more than 10 km (Figure 7). Relative to higher incomes, lower and middle-income groups still pay higher transportation costs, and inequalities in social status are reinforced and stabilized by solidified living spaces.

4. Summary

Combined with the social data and the evaluation results of questionnaire investigation, the social-spatial effect of residential differentiation is analyzed qualitatively and quantitatively from the macro perspective of the city and the micro perspective of the residents. Generally speaking, residential differentiation improves the targeting of community services, and ensures the safety of high-income strata and superior community support, but hinders the process of social mobility, which in turn widens the gap between the rich and the poor. Disadvantaged groups are forced to live in the urban periphery, reducing their access to employment opportunities, public service and

increasing transportation costs. Residential differentiation promotes the formation of social networks between high-income and low-income groups, which not only causes the poor to be further away from the mainstream society, buries hidden dangers for social security, but also deepens the contradiction of social classes, making urban space more fragmented and polarized.

In view of the above social effects, this paper proposes a series of targeted measures to enhance positive effects and curb negative effects. In order to play the positive role of improving the targeting of community services, it is proposed to create diversified communication spaces according to the communication methods of residents in different communities, organize cultural and entertainment activities with community characteristics and meeting the needs of residents of different classes by using libraries, cultural centers and other public facilities, improve the quality and cultural level of residents; in view of the negative effects of shrinking communication space and endangering public safety, it is proposed to promote appropriate mixed living, which means residents of different classes live in the same community. Mixed housing mode includes diversified population structure, housing condition, external environment, and service facilities. Mixed housing can deepen the understanding between different classes, the excellent community environment can provide disadvantaged groups for more employment opportunities and public services, thus improving social status and economic income level; In view of the negative effects of aggravating the unbalanced pattern of public resource, it is suggested that the investment in public resources and the maintenance of their public nature should be increased during the development of residential areas, the privatization of high-quality resources by high-income groups should be controlled, efforts should be made to improve the allocation of public facilities around middle and low grade communities, and different construction standards should be adopted for different communities to meet the needs of residents of different classes.

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