The Impact of Urban Renewal on Human Cognition and Behaviour: A Case Study in Tianzifang, Shanghai, China

Tuo Ding[1,a,*]

[1] *School of Architecture and Urban Planning, Anhui Jianzhu University, Hefei, China*
a. kakadingding@stu.ahjzu.edu.cn
*corresponding author

Abstract: In the background of the fast development of cities in China, urban renewal is becoming a more hotly discussed topic than ever. Lane Neighbourhood is a special presentation of old Shanghai features. But in the past decades, the Lane Neighbourhoods have experienced a decline in quantity and characteristics. Renewal of such urban districts is important for sustainable urban development and the continuation of cultural context. Most existing studies research this issue by focusing on an objective perspective. This article begins from a subjective perspective and chooses Tianzifang as a research target which goes through special renewal mode yet faces problems now. The article adopts questionnaires, interviews, cognitive mapping, space syntax, and GIS to analyse the impacts of urban renewal on people's cognition, behaviour, and relationship and to find out important environmental factors for people's life. Results show that community space is messy and unsustainable, with cultural characteristics fading. Relations between people are distant, and the development of industries affects a lot on cognition and life. The cognition of roads and districts is unbalanced, with the connection between factors weakened and special areas marginalized. Different aspects of features in Tianzifang are not fully recognized, utilized, and presented. This article provides suggestions for the future. The industrial pattern should be changed to address most cognitive issues. The space and life should be made more sustainable, cultural characteristics should be respected, and reasonable management should ensure all of these.

Keywords: urban renewal, lane neighbourhood, cognitive pattern, Shanghai

1.   Introduction

Urban renewal has been an important part of urban development in China in recent years. After coming through an era of high-speed development, cities have seen the construction of many new elements as well as fading away of many old resources. When facing different problems caused by a fast mode, people must consider the actual value of urban development, such as the distribution of resources and balancing advantages and disadvantages. The current urban renewal is transforming from incremental development to built-up area regeneration.

China has a long history, and any cultural heritages, such as ancient architecture and historical districts in urban areas, have been preserved. When facing these ancient legacies, urban renewal should be considered with greater challenges.

As the largest metropolis in China, Shanghai also contains rich historical sites and architecture, such as the districts hiding amongst modern buildings. Different from many ancient cities in China,

many of Shanghai's typical historic districts emerged just about 150 years ago, when it first experienced western transformation under the influence of colonialism. Rapid development made these historical districts not protected well. Lane-Neighbourhood is a special historical district that makes Shanghai special compared to other large cities. In recent years, the renewal of Lane-Neighbourhood districts has been gradually paid attention to, and some specific districts have gone through different renewal modes [1].
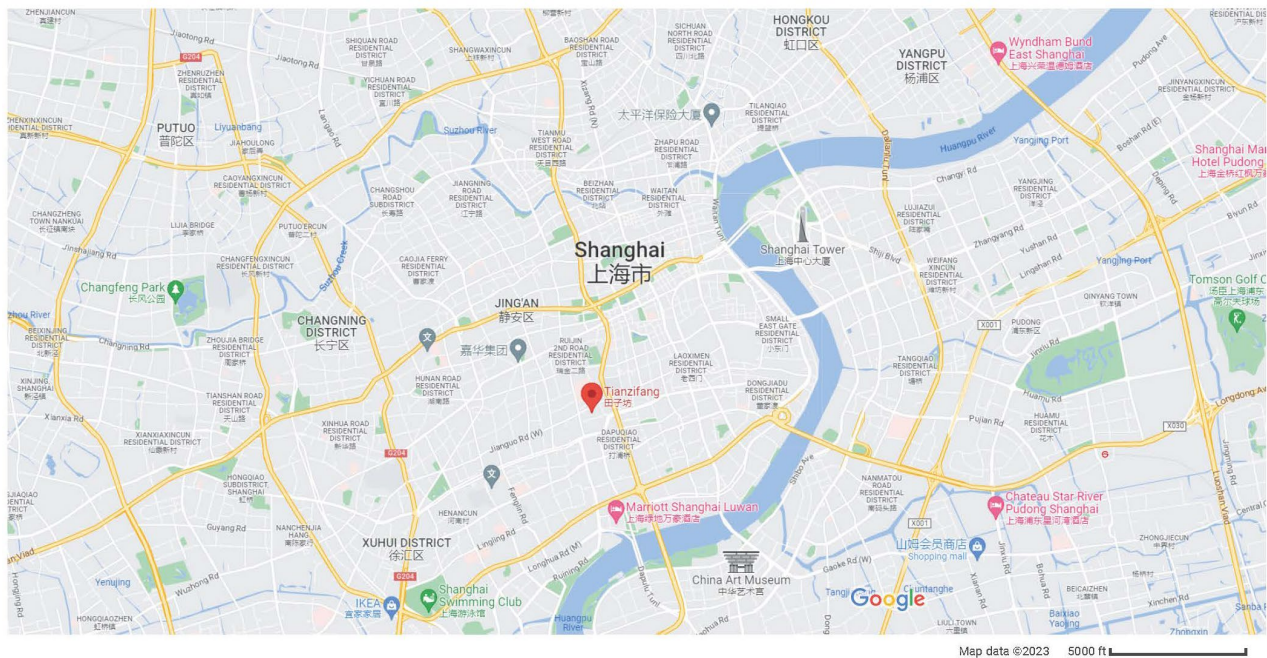

Figure 1: Location of Tianzifang (Google Maps)

Tianzifang, located on Taikang Road, Huangpu District, Shanghai (Figure 1), was a Lane-Neighbourhood community originally and has been successfully transformed into a tourist attraction in decades. Its renewal practice was mainly led by the masses at the community level, which is different from those government-led ones. Despite being a unique and successful renewal practice that has lasted for nearly twenty years, some problems have emerged in recent years in Tianzifang, such as the different spatial relations and usage, the change of the native's role, and excessive commercialization and entertainment.

This article takes Tianzifang as an example, adopts questionnaire, interview, cognitive mapping, space syntax, and GIS to analyze the impacts of urban renewal on people's cognition and behavior, analyzes the environmental factors in traditional community spaces that matter to people's lives, and provides some suggestions for renovating traditional community spaces. Through analyzing the effect and problems caused by urban renewal in Tianzifang, similar issues in other Lane Neighborhoods could be addressed, helping the preservation and continuation of the cultural context of Shanghai.

2. Background of Lane Neighborhood Renewal

2.1. Typical Lane Neighbourhood Renewal

Most of the Lane Neighbourhood districts in Shanghai are of Shikumen architectural style, which takes traditional Jiangnan courtyard houses as the form of expression, but the overall layout is affected by the western townhouse [1]. For decades, urban development and renewal have greatly changed Lane Neighbourhood districts in many aspects, from spatial arrangement to architectural style and

specific functional formats. Some typical communities have been transformed in different ways. Xintiandi is a community that experienced a government-led transformation, which changed the spatial pattern of the site. It also renewed the Shikumen architectural features and commercialized the community to a large extent. Bugaoli is a community that has been preserved and renewed on the basis of the old style, and many original aspects were fully respected during the practice. Hongkougang is a larger Lane-Neighbourhood district with a complete appearance and original water system and was chosen as a pilot area of the historic urban landscape (HUL) practice by UNESCO [2]. This one experienced a more complex renewal practice, with the old part preserved and combined with newly introduced elements.

2.2. Two Renewal Modes

There are two main different modes of renewal in Lane-Neighborhood communities. The first is the government-led mode, and the second is the community-led mode [3].

In the first mode, the government is the leader and pusher during the whole process. The interests of residents and other community users are put in second place. Under these circumstances, input of resources changes the pattern of the community a lot, making people no longer familiar with the community they used and lived in. The original residents were marginalized, and even some were forced to leave, and eventually another group of people took over this area. This, to some extent, is a concrete reflection of social value orientation turning towards economic interests [3].

The second mode allows the community and public to control the renewal process. Ordinary people and community administrators have their places and ideas when renewal occurs. Most of the people could participate in the renewal practice and the process might not seem so orderly in the beginning, but it is reasonable overall for future development, especially seen from the perspective of community people. Later on, there might also be government involvement, and former renewal executors will set a formal organization to help guide practices in the long term.

2.3. The Background of Tianzifang Renewal

The renewal of Tianzifang follows the community-led mode. In the early 1940s, the community comprised Lane Neighborhood and factory buildings. During the later decades, this place combined residential areas with workshop and shop fronts. At the end of the last century, those factory buildings were the first to be transformed, with artists moving in and changing them into cultural and creative parts. Because of the fast development of those parts and the vitality they brought to the community, many residents began to rent their houses to artists. This specific movement happened spontaneously and ensured the further development of art industries. Though transformation happened on different scales, all these practices kept the authenticity of Lane Neighborhood. Yet, with Tianzifang drawing more attention, the industrial pattern changes rapidly. Since the late 2000s, many facilities concerning tourism have been constructed, and the main function of residential areas has changed from living to commercial use, and even the commercial part has occupied a dominant position (Figure 2). It is not weird that those former residents' decisions contribute to this phenomenon because they saw the potential profits tourism and commerce can bring to them and the whole community. Thus, the rent skyrocketed, accelerating the leaving of artists and transforming industries. But it is this decision that caused problems to residents later.
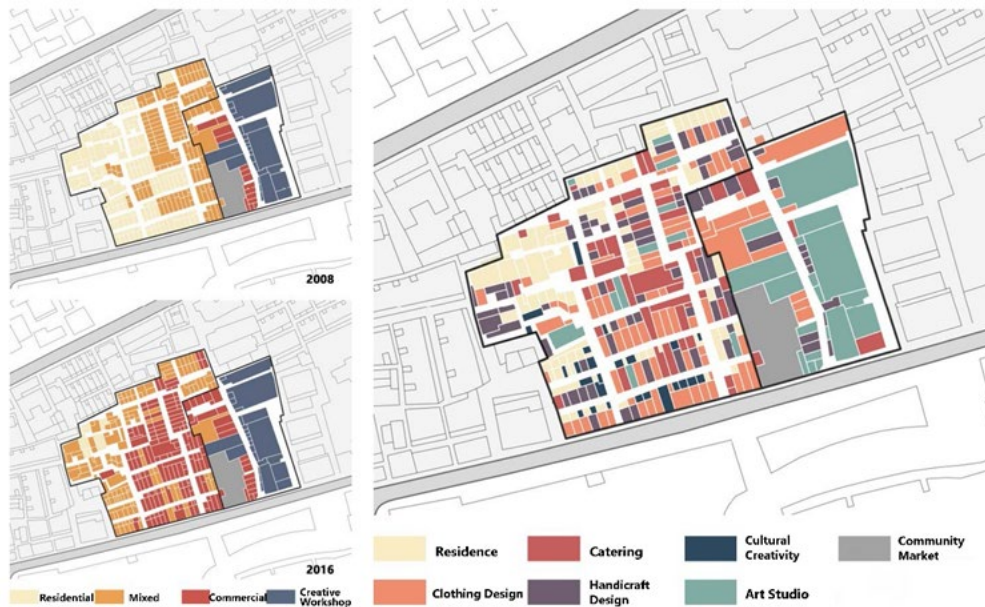
Figure 2: The use of buildings in Tianzifang [4]

As Tianzifang turned from a cultural and creative area to a tourist spot, more and more people moved out for a better life relying on the rent income. For those who chose to stay, their lives haven't gotten better. Artists and merchants have transformed a part of the space under the change of industry format, and the original spatial pattern of the community is increasingly not adapted to the new industrial mode. The distance between residence and commerce is continuously compressed, and the contradiction between tourists, merchants and residents is deepening, both on the spatial and social levels. Though establishing a specific committee has greatly improved these issues, and Tianzifang is now working well, urban renewal in this site is becoming unsustainable from a human perspective.

In this era, the driving force of space function has changed from material production to human life. In terms of governance subjects, user-driven mode with co-construction and co-governance is the main body and users are both consumers, producers and creators [5]. This means future urban development, especially urban renewal, should be human-centred. From the human perspective, the government-led mode causes adjacent segregation of people [6] and the loss of original lifestyle and site memories. In the case of Tianzifang, although the community-led mode is better in some ways, the benefits brought by this mode are changing into defects with the continuous functioning of this mode and Tianzifang becomes increasingly like a commercial district. In recent years, especially after the pandemic, the outcomes of the two renewal modes are more and more alike. Public issues encountered in urban renewal urgently need to be addressed.

3. Methodology

The subjective methods, including questionnaire, interview, cognitive mapping, and ethnographic observation, are applied in this study to obtain first-hand knowledge and experience of Tianzifang and people's opinions. Some objective methods are auxiliary and can support those subjective ones in further analysis and discussion. These methods include space syntax, GIS kernel density analysis, and some data from related research. It is also likely that some regulations published on official websites could provide some ideas for this study.

3.1. Subjective Methods

Fifteen questions were settled, and thirty questionnaires were delivered to investigate people's perceptions and attitudes toward this community space. The analysis of the outcome can be divided into three aspects. The first part is overall feeling and spatial judgments. People were asked about their attitudes toward the current situation, the renewal practice, the importance of each aspect, the cultural atmosphere and spatial complexity. The second part is about life and relations. People were asked about their identities, feelings about interpersonal relationships and usual facilities, and their willingness to interact with others. The third part is about industries and the economy. People were asked about their feelings about consumption level, the importance of each industry, and problems of industries such as the invasion and too high proportions. All these questionnaire data are integrated and analysed with other data, especially those mapping ones.

The interviews focus on the deeper users of this site, mainly those who live in the community or do business there. They have experienced and observed this place a lot and may have opinions on how to improve things. Interviews begin with aspects of those questionnaire questions, and issues are discussed in a more extended and detailed way. This method helps get more points and can be seen as an extension and supplement of questionnaires.

Cognitive mapping is based on personal observation of people's behaviours in the community and take the results of questionnaire survey and interviews into consideration. According to Kevin Lynch's theory, five elements of the urban image include path, edge, landmark, node and district [7]. These factors are useful for analysing urban spaces from a graphical perspective. A map containing those five elements is drawn to summarize and show the spatial pattern.

3.2. Objective Methods

In this research, objective methods help analyse cognition patterns and the current situation. The spatial syntax theory can analyse spatial morphology, finding out the spatial axis pattern of Tianzifang and quantitatively showing its details of it. Researchers have been considering the connection between space syntax and spatial image theory in recent years. Using case studies, former researchers intended to figure out that space syntax analysis and cognitive mapping complement and verify each other, which can help understand space more accurately. Moreover, spatial image theory can enrich humanistic Connotation [8]. The research mainly studies the integration and connectivity of the site and is expecting to find the difference between status quo and cognition.

GIS kernel density analysis begins by grabbing POI points from the internet. After initially searching for point information on Baidu Map and Gaode map, grab POI points using keywords such as Lane 248, which shows the detailed location of each point. Information on those points could be imported into GIS, and then the kernel density analysis could be exported on a map. This specific analysis supports the data from cognitive mapping and space syntax analysis in understanding the site's spatial pattern from the industry-type perspective.

In addition to all these methods, data from previous studies and official websites could show changes in Tianzifang in recent years scientifically and show the government's attitude in the present.

4. Results

4.1. Questionnaire

The result of the questionnaire survey is summarized in pie charts (Figure 3).

For the overall and spatial judgment part, the data shows that neutral and positive comments account for the majority of overall perception. Most people value experience and convenience but not

the other two aspects, which are also important, especially the cultural one. So basically, people don't put cultural aspects in the first place. Generally, the spatial pattern is not that clear but acceptable.

Figure 3: Results of the questionnaire survey

For the life and relations part, the proportion of residents is much lower than before. Most people are unfamiliar with each other, but many are willing to interact. Moreover, most people think the lack of usual facilities makes daily life inconvenient.

The overall consumption level is relatively high but lower than expected for the industrial and economic part. Also noteworthy is that while valuing experience and convenience, many people regard the cultural creativity part and residential part as important. Finally, people think the invasion of industries is great, and although the retail and catering industries are important for Tianzifang, the proportion of them is too high right now.

4.2. Interviews

Most tourists had a good impression of the space. However, interviewees who spent much time in the space, such as shop owners and residents, generally said the opposite. The majority of them agreed that some improvements should be made.

People in Tianzifang, especially those who live here, think the community's cleanliness should be improved because the living districts are mostly crowded and messy. More order should be introduced into these areas. Besides, basic infrastructure such as toilets, water supply, and drainage systems should be systematically upgraded, which is good for all site users. There could also be more characteristic decorations and green spaces to improve the overall feeling and make the space more sustainable.

Residents mainly live on the outskirt of the site, and some claimed they have few interactions with merchants or tourists; only some have known each other for years. These residents have generally adapted to the current situation, but disturbance caused by new industries should be further reduced. People all hope for more reasonable and orderly management. They are willing to interact, and the atmosphere is important for this.

For industries and the economy, visitors in Tianzifang have decreased compared to pre-pandemic time, especially foreign ones. After the pandemic, old-brand stores remain, and catering stores further replace cultural and creative stores. Many of the remaining stores are not attractive enough and rely on regular customers' patronage. People think promotion and marketing are necessary but should be implemented on the premise that traditional and cultural contexts are preserved.

4.3. Cognitive Mapping

The cognitive map is drawn based on personal experience and observation of community behaviour (Figure 4). Those elements are derived by combining pedestrian volume, aggregation degree, special points and personal feeling.

Figure 4: Cognitive map of Tianzifang

Three main longitudinal roads go through the whole community, corresponding to three site entrances. More people choose the middle one to experience first, while the other two are at the edge of the central cognitive area. The northern part of the road on the west side is mostly recognized by visitors who go further into the community. Roads with more people and more nodes and landmarks are located at the boundary of different districts. Generally seeing, latitudinal roads are less used by people than longitudinal ones. The connection between the three main roads is weak, making the site easier to be recognized as three longitudinal sections.

Most of the two special districts lie beyond the cognitive edge, with few people going through and experiencing. Smaller landmarks locate in places with lower pedestrian volume.

4.4. Objective Results

The kernel density analysis of POI points in Tianzifang shows the spatial pattern of those points (Figure 5). This density map shows similarities and differences when overlayed with the cognitive map.
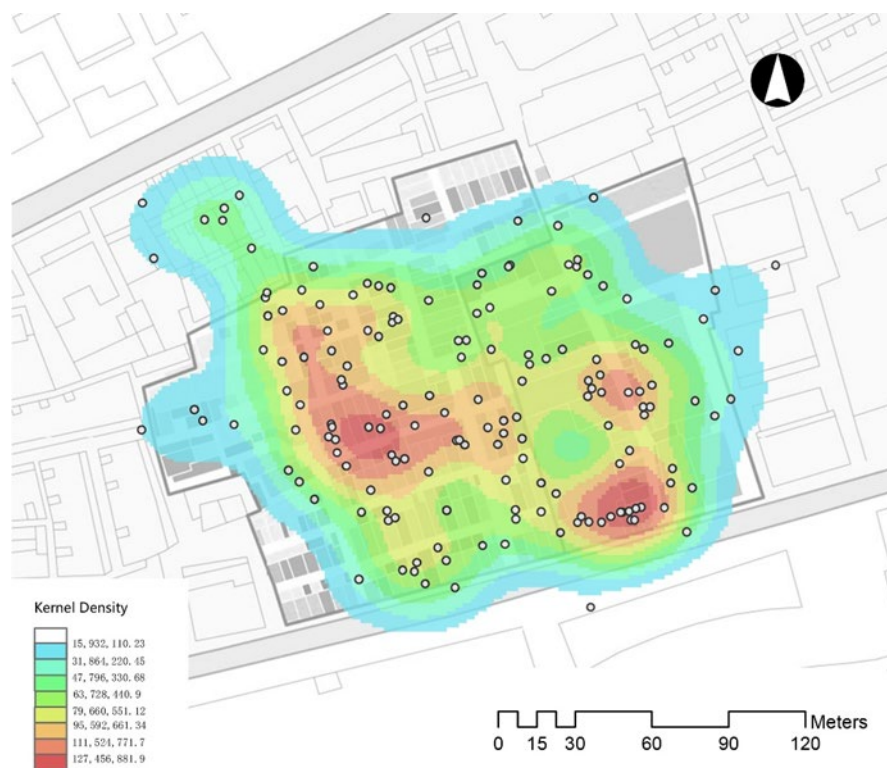

Figure 5: Kernel density of POI points

The northern part of the road on the west side has a high density of POI points, and this is the place where people experience and gather most. The middle of the road on the east side has relatively high density, corresponding to better cognition of the path and landmark pattern of this road.

But there is a latitudinal road with higher density but fewer people visiting than nearby areas. Also, the northeast corner of the community has more cognitive landmarks but a lower density of POI points. The southeast corner of Tianzifang has high density, mainly because of those external stores but not those that impact the community.

The space syntax pattern comes from the analysis of the road network structure of Tianzifang. By changing the axial map into a segment map, roads on this site can be analysed more accurately. First comes the connectivity result, and the integration result is generated through angular segment analysis.

By comparing these results with former mapping results, similarities can be seen in the cognition and connectivity of the roads. Roads that are mostly recognized by people generally have higher connectivity (Figure 6). But when talking about integration results, it fits the cognitive pattern poorly,
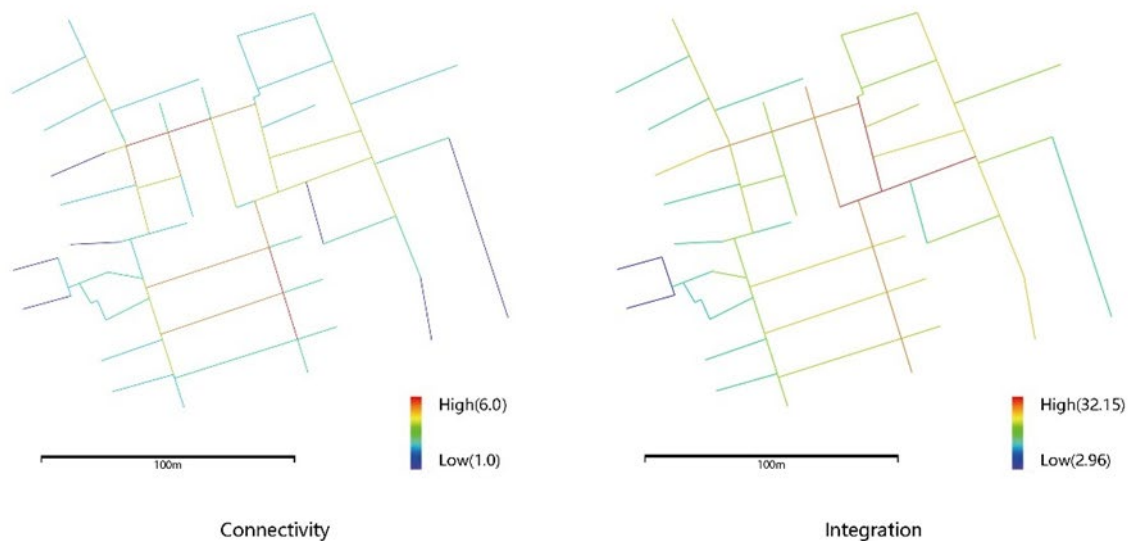

Figure 6. Connectivity and integration of roads in Tianzifang (Author)

with central roads having higher integration but less used by people. Despite this, other important roads still have good integration.

5. Discussion

5.1. Effects of Renewal on People

Apart from changes that urban renewal brought to Tianzifang in recent years, there are also changes in the perceptions and attitudes of people. Nowadays, those factors are of vital importance for the future of Tianzifang.

The results of the questionnaire and interviews show that the overall status quo is acceptable. The cultural aspect is generally focused but not that valued. People pay more attention to this community's actual user experience, and cultural characteristics are weakened. Ignorance of daily experiences, especially infrastructural aspects, makes life unsustainable. Spatial features should keep pace with time, and the current situation makes more people willing to leave. People mainly mind their affairs and are unfamiliar with each other, yet most are still willing to interact or hesitate. Previous renewal practices have not created conditions for communication. The shortcoming of material conditions may lead to the current situation of interpersonal relationships.

For residents, the disturbance brought by industries still exists. Meanwhile, related management is not strong enough to bring more order. The extent of commercial encroachment is greater, especially after the pandemic. After the pandemic, renewal in the industrial aspect makes consumption levels higher, but there are fewer visitors now. The economic situation is worse now, and in this industrial context, the survival of cultural creativity stores and old-brand stores has become a problem. However, it is good that people attach importance to residential, cultural, and creative areas.

As for the mapping results, latitudinal roads in the site were not stressed enough during renewal practices. The connection between different parts, especially different cognitive districts, is weak, which is not good for the site's recognition as a closer whole. These two districts, which are now valued and important for this community's future, are now marginalized. This situation can be concluded from the cognitive map and seen from connectivity and integration analysis of space syntax analysis. Higher connectivity of roads and more POI points help people recognize and explore spaces, but the area with higher integration is not being utilized properly. The northeast corner of the community is relatively more important in people's cognition, due to the quality of points than quantity. But smaller landmarks are generally less important in people's cognition, which makes it hard for site features to be fully displayed.

5.2. Factors from the Human Perspective

Four main factors concluded from the analysis affect people's cognition. First is the density of POI points or stores. Higher density makes more people experience the area, while lower makes spaces less attractive. The next is connectivity and convenience of the roads. Higher connectivity and convenience make specific places easier to reach and provide better feelings. The blind alleys and remote roads in Tianzifang are usually for residents to use and are more private. Then is the connectivity and openness of spaces, similar to the previous factor. Open spaces gather more people, and narrow places like alleys and streets on the site alienate people. The final one is the featured point. The feature of special points includes environmental characteristics such as decorations and the special status of the points, which in Tianzifang comes from the historical background and official recognition.

5.3. Suggestions for Future Renewal

Assessing the perceptions and understanding the relationships between environmental features and perceptions are critical to the design and management of urban spaces [9]. As a result, some suggestions should be made to make the future renewal of Tianzifang take a better path.

The original style and culture of Tianzifang must be fully respected. On this basis, spatial and material features should be improved to give daily users, especially residents, a better experience. The spaces should be cleaner, such as important roads and narrow alleys. Old and redundant part in spaces should be replaced with newer one that fits the style and features of the community. Problems such as unauthorized occupation and alteration of spaces should be addressed, and the infrastructure of Tianzifang needs urgent renewal. Also, more characteristic decorations and green spaces could make public spaces more sustainable.

The industrial pattern of Tianzifang should be planned again. Commercial industries must be reduced, and people should encourage, support and guide the development of cultural and creative industries, making this community an art and culture-oriented community like years before. Meanwhile, the importance of residential areas must be emphasized. To make commerce more dynamic, shop owners could consider advertising in a novel way and make their business more attractive among young people.

Industries planning, including distribution and proportion, can be considered together with the site's spatial pattern and cognitive situation. More reasonable industrial planning can guide people's experience of the community, which will eventually form better cognition. Relation between three different districts must be stressed. At certain levels, further separation between residential and other areas is necessary considering disturbance, but people should prevent users of the non-commercial district from being marginalized.

All these proposals should function under a stronger management system to bring more order to this community and make development sustainable. An autonomous selection platform that coordinates the relationship between the government, market, and individuals is a way to renew Lane Neighbourhood [10]. People related to this community can form a co-governance platform to self-regulate daily behaviours and provide advice for committees and even the government.

6. Conclusion

This research finds that changes in Tianzifang brought by urban renewal are also accompanied by changes in people's life and thought, which is important in measuring the gains and losses of urban renewal and guiding future practices. These changes are multifaceted, and the answer to one single question may differ depending on the target people.

Renewal practices in recent years led this community into a more popular mode with capital and market and more welcomed by consumers. In this background, overweighting of commerce and economy is inevitable. This phenomenon weakens cultural atmosphere and people's perception of cultural characteristics. Also, the experience of tourists and residents is affected. The non-commercial area is marginalized, and specific site features cannot be fully embodied. Residents' life is marginalized, with external characteristics emphasized and inner spatial pattern ignored. Tianzifang is now consumer-centred, where tourists seek other experiences and residents cannot make changes.

Previous studies mainly focused on observing and analysing from a researcher's perspective and took subjective methods such as questionnaires as a supplement and assistance. This study sees subjective perspective, especially that of local people, as the key to understand the site. The importance of subjective perspective is stressed through mapping and spatial analysing of subjective and objective factors, which demonstrates cognitive pattern in a spatial way. This study is good for evaluating urban renewal practices impartially and reflecting people's concerns intuitively. The renewal mode of Tianzifang was once creative and inspiring, but during its self-evolution progress, things changed and eventually became similar to other Lane Neighbourhoods. Exploring the impact of urban renewal in such a community can not only guide it onto a better way of development in the future, showing its specificity and adapting it to the changes of the times while keeping its authenticity, but also provide inspiration for cases alike in Shanghai and protect the whole configuration of Lane Neighbourhoods in old urban area. By implementing reasonable urban renewal practices, the cultural context of a city can be preserved and continued. Still, this study has shortcomings, such as lacking enough samples and subjective data, and insufficient comprehensive consideration of factors.

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