Public Space Quality Evaluation of Xiqin Road from the Perspective of PSPL Research Method

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Abstract. This paper investigates Xiqin Road from the perspective of Yang Gail's PSPL research method. This method could help us to understand and master the characteristics of people's activities and behaviors in the public space of Xiqin Road. This paper analyzes qualitatively and quantitatively the research results and puts forward the optimization opinions and suggestions of the public space in order to create a high-quality public space to meet the needs of citizens to carry out public life activity.

Keywords: PSPL survey method, Public space, Quality of public life

1. Introduction
With the continuous development of China's economy and the acceleration of urbanization, people's demands on the quality of public life are getting higher and higher, however, the existing public space cannot meet people's increasing demands. At the same time, China's urban planning is based on the demand of vehicles while the needs of people in the city has been ignored. Nowadays, urban street space is faced with many problems: (1) street space lacks vitality; (2) People's demands for rest and activities are ignored. (3) The number of motor vehicles is growing exponentially, the space for people's activities is squeezed and the contradiction between people and vehicles increases.

Based on the PSPL research method, this paper investigates the cross sections of Xiqin and Caobao road. Through the investigation of public space and public life, people can understand the using rule of people for the existing street space and the current situation of people to take part in activities in the public space more intuitively. What’s more, the public space quality improvement of the cross sections of Xiqin and Caobao road are also proposed.

2. Overview of Research Methods
PSPL research method is a research method which is proposed by Jan Gale, a Danish urban planner. This research method is based on the study of pedestrian, non-motor vehicle traffic characteristics and staying activities, as well as the specific analysis of the quality of urban streets, squares and other public space that related to the physical environment. It is mainly composed of four methods.

3. Survey and Research on The Street Space of Xiqin Road
3.1. Overall Overview
Xiqin Road is located in Xuhui District, Shanghai, reaching Caobao Road in the south and Guanshengyuan Road in the north. This paper mainly studies the caobao Road to Kangjian Road section,
which is a one-way street mainly filled with residential areas and the overall vitality of the whole street is poor. The street is lined with convenience stores and restaurants.

3.2. Survey and Research on Public Space of Xiqin Road

3.2.1. Spatial Scale of Xiqin Road. The section from Caobao Road to Kangjian on Xiqin Road is 260 meters in length, with one way two-lanes (the section at the entrance of Everbright Convention and Exhibition Center is three lanes). The motorway is 5 meters wide, and the non-motorized lanes on both sides are 2 meters wide. There is a railing separation between the pavement and the roadway while there is a railing separation between the non-motorized driveway and the motorway on the side of the residential building. The residential building has 6 floors and the sidewalk on this side is wider than the other side, which wakens the sense of enclosure for people to walk in this space.

3.2.2. Quality of Public Space on Xiqin Road. The street space of Xiqin Road includes two city squares: Guangda West Square and Guangda East Square with a small public space—corner space. According to the actual investigation, the utilization rate of the two squares in the east and west of Everbright is low with inadequate infrastructure.

Everbright east, west two square are affiliated outdoor space, which belongs to large public buildings. As a buffer zone of the main entrance of architecture, they play an important part in distribution of crowds. It is need to mention that everbright convention &exhibition center undertakes all kinds of exhibitions on holidays. The major function of the west square is flow distribution in the holiday while leisure and entertainment in working days. Their design is mainly from the perspective of function and form, but lack the consideration of street domain and user experience. Basically, pavement installation lacks the limitation and division of space and infrastructure.

Finally, the open space of Xiqin Road lacks consideration of humanization. 1) Infrastructure: The open space not only lacks protection facilities to shade the sun and shelter from rain, but also lacks public seats to provide conditions for pedestrians to stay. 2) Space enclosure: afforestation and sketches are used for space enclosure. The appropriate spatial scale and spatial boundary effect can provide users a pleasant and comfortable space environment.

It can be seen from FIG.1 that the side near Caobao Road in Xiqin Road has many open Spaces and large volume buildings. The other side has dense building and the majority area is residential area with almost no open space.

A total of 100 people were interviewed, among whom the female accounted for 64% and the male accounted for 36%. In terms of age structure, the top two groups are 20-29 years old and 30-29 years old respectively. Among them, people who come to Xiqin Road frequently account for 50%, those who come here occasionally account for 36%, and those who come here for the first time account for 14%. It can be inferred that people who use the street space are mainly those who come here frequently.

In the survey of the reasons why people stay on the street, the highest proportion (46%) were those who were nearby to work, followed by those who were waiting for someone, and the third was those who were waiting for work. About the purpose in the survey, the highest proportion is to work share 38%, dining is the second, and the third is passing around. The analysis results show that the people used Xiqin Road for working, dining and other activities, so in the later research on Xiqin Road, more attention should be paid to the commercial properties of this street.
3.2.3. Facade of Building Facing the Street of Xiqin Road. As shown in FIG. 2, the section of Xiqin Road is mainly composed of small and medium-sized buildings with 6-7 floors, and its main formats are retail and residential. Large commercial buildings at the junction of Xiqin Road and Cao Bao Road.

Figure 1. Spatial Distribution of Xiqin Road

Figure 2. The Architectural Volume Analysis Diagram of Xiqin Road
The reason why the ground floor facades on the east and west sides of the 260-meter Xiqin Road are selected for comparison and observation respectively is that the quality of the street-side facades has different influences on the street space. There are a total of 17 entrances in the west facade of Xiqin Road. Excluding the entrance of Everbright Convention and Exhibition Center, there are 9 entrances per 100 meters. The building is mainly commercial, and 5 categories of facade quality on the ground floor of the street belong to C-general interface. Compared with the quality of the street-facing facade on the ground floor, the five categories belong to D's lifeless interface, the eastern part of the street-facing facade is a wall with only one entrance and entrance. Compared with the quality of street-facing facade, 5 categories belong to B-friendly interface, the street-facing part of Everbright Convention and Exhibition Center is 75 meters long with a total of 8 entrances and 10 entrances per meter.

3.3. Survey and Research on the Walking Space of Xiqin Road

3.3.1. Walking Activities. Walking is the simplest and most common way for people to get around. In addition to its traffic function, sidewalk is also a place where people carry out their daily activities in public space. Pavements have a "square" effect and are the potential starting points and places where many other activities take place.

![Figure 3. Survey Section and Node Selection Diagram of Xiqin Road](image)

Survey section: three sections are selected for the survey. Section 1 is Xiqin Road, section 2 and section 3 is the entrance of Kangjian Road into Xiqin Road. The method adopted in section survey is to record the number of people traveling within 10 minutes respectively and select 12 time periods (7:00-19:00) in a day respectively. The holiday was recorded on October 14 and the weather was fine. The working day was recorded on October 15. The weather was overcast and windy.

By comparing the total amount of travel of each section in working days and holidays, it can be seen that the flow of people in holidays is more than that in working days. Because Everbright Convention and Exhibition Center holds exhibitions in holidays, the flow of people is more concentrated in 1 place.
Figure 4. Xi Qin Road Working Day Walking Total  

On weekdays, the graphs indicate that the number of people starts to rise from 12 o'clock to 15 o'clock, then the number declines. During holidays, section 1 has a large crowd from 7 am and reaches its peak at 11 am, but section 2 and section 3 have a small number of people walking in the morning and begin to climb after 9 am.

As shown in FIG. 6, from the perspective of age composition of total trips, young people are the majority of people who travel on weekdays and weekends.

Figure 5. Xi Qin Road Holiday Walking Total  

Among people who travel on weekends, young people account for 45% of the total, which is the highest proportion, followed by the elderly, accounting for 24%. On weekdays, young people also dominated, accounting for 49% of the total, followed by middle-aged people with 27%. It can be seen that the age composition of the travel crowd on Xi Qin Road is relatively stable, and the main travel force is young people.

Figure 6. The Proportion of People of Different Ages Going on Foot on Xi Qin Road

3.3.2. Patency of Walking. There are three parking lots on the east and west sides of the Xi Qin Road walking system. Due to the lack of planned non-motorized lanes, a large number of non-motorized vehicles occupy the walking path, which hinders people's passage and deepens the contradiction between pedestrians and non-motorized vehicles.

3.4. Investigate and Study the Stay Space on Xi Qin Road

3.4.1. Stay Activities. Research node: Node A is Guangda West Square and Node B is Guangda East Square. The selected nodes were observed by map marking method and field counting method respectively (the holiday was recorded on October 14, and the weather was fine. The working day was recorded on October 15, the weather was overcast and windy).
Figure 7. Survey Section and Node Selection Diagram of Xiqin

From the perspective of the usage of each node in different time periods. On weekdays: the activity peak of Node A mainly concentrates from 12 to 14 o’clock; the number of users of Node B rises from 8 o’clock until it reaches its peak at 10 o’clock. On weekends, the number of users of Point A is mostly concentrated between 13:00 and 15:00, which is significantly increased compared to weekdays. Node B has a small increase in the number of weekend users. In weekdays, the number of activities at Node B is more than that of Node A while it is the opposite in holidays. This is because The Everbright Convention and Exhibition Center will hold exhibitions in holidays and Node A plays the role of crowd evacuation.

Figure 8. Comparison Graph of the Number of Active People in Node A
The main activity type at each node of Xiqin Road is passing activity and the staying behavior of pedestrians is relatively few. During the workday, 96% were passing activity and 4% were static state. Among them, 3% stood and 1% sat. During the holidays, passing activity accounts for 86% and static state accounts for 14%. Of these, 8% stood and 6% sat. The reason why sitting people less than standing people is that there are no public seats to rest in rather people unwilling to sit.

3.4.2. Stopping Activities. Node A, Node B, Node C are dominated by standing activity. It can be seen from the figures (FIG. 11 and 12) that the number of people engaged in activities during holidays is higher than that during working days.

According to the survey on the three nodes of Xiqin Road, only node B has rest activities. That is because except for the rest seats provided by the shops at the gate of Everbright, there are no public seats available for people to rest in the whole road section., so that here are plenty of people to rest on the seat.
3.5. Problems Existing in the Current Situation of Xiqin Road

3.5.1. Single Industrial Function. The current commercial formats of Xiqin Road includes retail, bank branches and catering. It is mainly about commercial functions. However, the shops at the ground floor...
along the street have single functions, poor complementarity with each other and less combination with the functional properties of surrounding buildings.

3.5.2. Lack of Humanized Infrastructure. Xiqin Road street space lack of humanized care infrastructure. Xiqin Road lacks seat arrangement, shading structures, non-motor vehicles parking spaces and barrier-free facilities design. For the construction of the street, the rationality of the space can be enhanced and the use of humanized facilities can be used to build more abundant, more convenient public space.

3.5.3. Non-motor Vehicle Parking is Disorderly. There are a lot of office buildings around Xiqin Road and a lot of non-motorized need to park. The existing non-motorized parking spaces cannot meet the parking needs. There are a large number of people on Xiqin Road, but a large amount of non-motor vehicles parked on the sidewalk hinder walking. In order to pass through this section, some pedestrians will walk into the non-motorized lane, which causes the potential safety hazards for pedestrians.

3.5.4. The Street-facing Facade Lacks Interests. The street facade of this section is mostly c-like interface, and the interests of the street facade is also an important aspect to enhance the public space. The reason why the street have boring facades can also be attributed to the monotonous industrial structure of the section. So the industrial structure have to mainly focused on the necessary industries such as catering and retail.

4. Space Activity Optimization Strategy of Xiqin Road Street

4.1. Optimization of Street Walking Space
There are a large number of non-motor vehicles parked on this section of road. After on-site counting, 236 non-motor vehicles are parked on this section of road, of which 150 are parked at the intersection of Xiqin Road and Caobao Road. Most of them are the vehicles of people who work in this section.

We need to arrange reasonable barrier-free facilities in the street space to ensure the convenience of the disabled. However, in the actual investigation, the blind roads in the streets of Xiqin Road are arbitrarily occupied or do not meet the practical requirements. Therefore, the blind roads and other infrastructure should be set reasonably under the actual conditions.

Pavement need to ensure the pavement is smooth and easy to walk. The second is the comfort and safety of the paving and the last is the aesthetic degree of shop outfit. Given that Shanghai is a wet and rainy city, the pavement of this section should be made of material with good water permeability and anti-skid effect.

4.2. Optimization of Street Stop Space
When improving the quality of public space, it should be based on the characteristics of people's activities and possible communication activities in the space. In the West Square, due to the exhibition of holidays, the possible behaviors is to waiting for admission, waiting for companions and exchanging information, etc. with the state of standing, sitting and chatting. It should focus on the staying of people, leaving an empty space and rest facilities should be arranged at the boundary of the site. It does not interfere with pedestrians' walking and has relatively independent space with good enclosure to attract people to stay.

4.3. Optimization of Street Open Space
The seat arrangement in the street can make people stay in the street for a short time, prolonging people's staying in the street, improving the possibility of people's activities in the street and enhancing the vitality of the street. When considering the material, position and quantity of the seats, it is also necessary to consider how to provide people with interesting and varied views to increase the possibility of stopping.
5. Conclusion

This paper investigates the public space of Xiqin Road under the framework of PSPL and gives some suggestions on the improvement of the public space quality of Xiqin Road based on the research results. However, due to the lack of experience and time, the opinions that put forward are relatively empty and their rationality has not been verified by field practice. Due to the serious aging of this section, most of the permanent residents encountered in the interview survey were the elderly who are over 60 years old. The next work is to materialize these opinions, trying to find the insufficient in the use of residents and continue to improve.

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