



Research Paper

# Research on the Environment-Behaviour of Rural Public Space

Xiaochen Dong, Xinqun Feng

College of Fashion and Design, Donghua University, Shanghai, China

Corresponding Author: Xinqun Feng

**ABSTRACT:** This paper is based on the theory of environment-behaviour. A typical Jiangnan village is used as an experimental sample using the SOPARC approach. It explores the environment-behaviour of the sample in three dimensions: physical environmental elements, residents' behavioural activities and perceptual cognition. The findings show that: the lack of vitality in rural public spaces is mainly due to the low spontaneous activities of villagers; unreasonable planning and low participation significantly reduce the effective use of public spaces. The result provides favourable theoretical and data support for stimulating the vitality of rural public spaces and promoting a virtuous cycle between people and the rural environment.

**KEYWORDS:** environment-behaviour, rural public space, space vitality, behaviour of humans

Received 10 Dec., 2022; Revised 23 Dec., 2022; Accepted 25 Dec., 2022 © The author(s) 2022.

Published with open access at [www.questjournals.org](http://www.questjournals.org)

## I. INTRODUCTION

The expansion of urbanisation has led directly to a reduction in the use of public space in rural areas. Rural areas face many issues, such as rural maintenance, vulnerable groups' concerns, children's education, and environmental management. In China, the decline of public space in rural areas is as prevalent as the above issues. However, as these problems do not directly impact the lives of the inhabitants, the issue of rural public space needs more attention. The 20th Congress of the Communist Party of China proposed to "comprehensively promote the revitalisation of the rural", which aims not only to increase the per capita income of the inhabitants but also to rationalise the development of public space and thus strengthen the ties of rural society<sup>[1]</sup>. The decay of rural public space is the result of multiple factors. How to stimulate the vitality of rural public space from the perspective of design studies is an urgent challenge. This paper is based on the theory of environment-behaviour. A typical Jiangnan village is used as an experimental sample and explores the environment-behaviour of the sample in three dimensions: physical environmental elements, residents' behavioural activities and perceptual cognition.

## II. THEORETICAL RESEARCH

### 2.1 Environment-behaviour studies

Environment-behaviour studies is a social science that explores the potential connections between people and the physical environment around them. Environment-behaviour studies was first developed in the northern part of the United States and has spread rapidly worldwide, becoming more influential in developed countries and regions. The introduction of the theory of environment-behaviour in China dates back to the 1980s, intended to bridge society and the surroundings to achieve a dialectic of environment and humanity<sup>[2]</sup>.

Environment-behaviour studies was identified initially as part of the same discipline as environmental psychology. However, the focus and scope of the two studies are quite different: environmental psychology prefers to investigate the association between external factors and individual psychology, for instance, perception, cognition, and acquisition. Environment-behaviour studies explores the above issues while focusing on uncovering behavioural characteristics, societal perceptions, and cultural distinctions<sup>[3]</sup>. Both environmental psychology and environment-behaviour are based on psychology and matched methodology to explore the interrelationship between the environment and human beings. Its purpose is to clarify the direct impact

conditions of the nature of the physical environment and the mechanism and degree of changing the quality of life. Furthermore, from the perspective of humanities, it applies the implementation of policies, layout, planning, knowledge popularization and other methods to spread research results to improve the quality of life to achieve the goal of improving the happiness index of the population<sup>[4]</sup>.

The relationship between humans and external factors is complex, and many schools of thought have sprung up in the course of this research. The fundamental difference lies in the view of the relationship between humans and the environment. Currently, the main theories of environmental -behaviour are environmentalism, interactionalism, and transactionalism. Environmentalism does not consider humans' guiding role in the environment, attributing all determinants of human behaviour to the environment. The argument focuses on the idea that human behaviour is a product of environmental guidance. Interactionalism, on the other hand, builds on environmentalism and goes deeper, exploring the possible associations between the environment and human behaviour. Transactionalism proposes that in addition to the formal influence humans can bring to their surroundings, they can also directly determine the direction of the substantive evolution of the environment.

## **2.2 Rural public space**

The term 'public space' was coined by Charles Madge, a leading social scientist in the 1950s, who wrote about it in his book *Private and Public Space*. The book argues that public space is the environmental manifestation of the public sphere and is an essential vehicle for human interaction.

In the 1970s, the concept of public space has been widespread in sociology, politics and planning. In planning, the rural public space is a vehicle for exchanging social information between people living in rural areas. Due to the distance between villages, humans' contact with the external is not close, and the 'acquaintance' social association was created as a public area for disseminating information and recreation. The public area is closely related to the customs and traditions of the village and is a crucial point of communication and material transfer between locals.

Rural public space is a critical element to folks and contains different mechanisms of the interrelationship between humans and the environment. In general, the relationships and behaviours between people and the environment in rural public spaces fall within the scope of the theory of environment-behaviour. Rural public spaces can be differentiated by physical form, function and degree of openness. However, no matter how they are differentiated, their significant role in connecting the environment with humans cannot be ignored. The category of public space in this research is spaces that carry interpersonal relationships and generate social behaviour.

Jan Gehl categorized behavioural activities in public spaces into a necessity, spontaneous, and societal activities. Necessary activities are mainly indispensable to life, such as working, receiving education, and purchasing household goods, which are almost unrelated to the environment. Spontaneous activities occur only under certain external conditions, such as sports, gossip, and rest. Social activities are mainly those activities in which people are the objects of the activities, and social interaction exists. They can improve the efficiency of social activities by optimizing the factors influencing the occurrence of the first two types of activities in public open spaces.

## **2.3 Analysis of correlation**

If space is not connected to the social activities within it, then it can be defined only as an objective existence and has no meaning in studying behaviour. We need to consider the role of space as a vehicle for social activity and behaviour. The variety of theories currently applied to studying spatial interaction is prominent. Due to limited content, the paper is biased regarding the purposeful meaning of the theories applied in the study. This paper takes rural public spaces as the object of study, focusing on the behavioural and psychological demands within them.

People generate behaviour, and the spatial environment facilitates, induces and hinders human behaviour. Therefore it has a definite connection with humans and behaviour. Traditional public spaces are in decline, and new public spaces need to be more vibrant because they do not suit the villagers' demands. By understanding the interaction between the environment and human beings from the theory of environment-behaviour and using this as the theoretical support for research, the experiments on the behavioural patterns and psychological characteristics of subjects using environmental, behavioural research methods, the data obtained provide a scientific and reliable basis for designers to identify the root causes of the lack of vitality in rural public spaces.

### III. ANALYSIS OF SAMPLE SPATIAL ELEMENTS

#### 4.1 Environmental overview of the experimental sample

Yanjiaqiao (YJQ) is located at the junction of the cities of Wuxi, Changshu and Jiangyin, The village is built on the river, forming a parallel village pattern of water and land. The village has a history of more than 700 years and has a resident population of around 2,000, continuing the lifestyle of a natural village. YJQ is the fourth batch of historical and cultural villages in Jiangsu Province. It has been previously renewed, and the public space is relatively free and open for visits by visitors from outside the village, in addition to residents.

#### 4.2 Analysis of public space elements

YJQ has a wide distribution of public spaces, and this research area focuses on the public spaces distributed along the river. The following is an analysis of four spatial elements according to the actual spatial types in the village.

Table1: Types of public space in YJQ

Type	Space characteristics
Square space	The village square has basic facilities for the public, and the cultural square has typical Jiangnan garden features, with various of patterns and a waterfront
Waterfront space	Throughout the village, symbolizing the industrial character of the village, the waterfront corridor is touristic
Street and lane space	The entire skeleton of the village, crisscrossed in a dendritic vein
Nodal space	Including pavilions, installations and stone bridges built around the water, creating a unique view of the Jiangnan

Square space: YJQ's Village Square has two types of space according to its function: the Village Hall and the Cultural Square. The car park and the basketball hoop are set up in the Village Hall to facilitate the locals' daily communication activities. The cultural square is adjacent to the waterfront and has a diverse pattern, with the spatial layout and landscape having typical Jiangnan characteristics.

Waterfront Space: Water is the soul of the village in the Jiangnan region, and a flowing river can breathe more energy into the stationary space of the village. The waterfront is lined with a promenade, which is now the main activity area in the village's water space.

Street and Lane Space: The streets and lanes are the backbones of the traditional village, carrying out the functions of rural transportation, trade and housing, and being the place for villagers to communicate daily, forming a dendritic network with other paths. The village streets and lanes are divided into main roads, alleyways and walkways.

Nodal spaces: In his book, *The Image Of The City*, American humanist planner Kevin Lynch suggests that a node is a road connection or a concentration of specific features in a city, a point where people's eyes often converge. Nodal spaces in YJQ include pavilions, installations and stone bridges, most of which are built around the water system, forming a distinctive Jiangnan scenery.

### IV. RESEARCH METHOD

#### 4.1 The System for Observing Play and Recreation in Communities(SOPARC)

Mckenzie proposed SOPARC in 2006, a scale for collecting information on physical activity according to batch sampling at different times. Using this method, the observer can systematically and periodically observe and record the behavioural characteristics and environmental information of people in the target area through questionnaires, interviews, and telephone interviews without disturbing the subject. The paper uses SOPARC to examine data on the behavioural characteristics of villagers' activities in public spaces. Incidental questionnaires and interviews were distributed in this investigation to examine villagers' satisfaction and behavioural and psychological requirements. Jan Gehl's classification of public space activities, necessity activities, spontaneous activities and social activities is the basis for classifying this part of the experimental content.

#### 4.2 Data collection

Observations were made by four groups of people in each of the four public spaces between 06:00 and 22:00 each day, recording the structural characteristics of the visitors, visiting hours and their behavioural tendencies. A total of 629 valid samples were collected over the three observation days. The entire data collection process was carried out strictly following the recreational behaviour observation method to ensure high accuracy.

### V. DATE ANALYSIS

Residents' motivation for recreation is mainly leisure and physical exercise. There are seven main activities: shopping, working, gathering and chatting, square dancing, physical exercise, carrying children, and recreation. There are apparent age and gender differences between the residents who choose different activities, with those who shop and have children mainly between 19-40 years old; those who gather and chat and square dance are primarily middle-aged and older women between 41- 65 years old. Those who work and exercise are predominantly young and middle-aged people between the ages of 19-40. The young and middle-aged group prefers activities of daily living with a higher activity level. At the same time, the elderly tend to choose activities of lower intensity, such as playing cards and chatting, due to physical immobility.

Regarding the gender structure of the villagers, the number of women is slightly more significant than men. Regarding age structure, the age group that participates in public activities frequently is mainly middle-aged and older people aged 41-65, followed by young people aged 19-40. On the whole, there is little deviation in the gender structure of the public space users, and it is distributed among different age groups. It indicates that the village's public space is attractive to residents of different genders and ages and is suitable for a wide range of people.

The peak of locals' activity time occurs from 18-22 (41.3%) when the people will stroll, gather for square dance, and play basketball after dinner. They prefer the wide village square to the cultural square with its circuitous pattern, followed by the morning from 6-9 (30.3%), where most active people exercise, go shopping and work in the fields. As the weather was still hot at the end of summer, 6.4% and 10.7% of the villagers chose to go to the waterfront after lunch to play chess and cards or to take their children out.

Table2: Population Structure and Behaviour Record Form

Recording item	Category	Quantity	Ratio/%
gender	male	304	48.30
	female	325	51.70
age	0-12	51	8.10
	13-18	36	5.72
	19-40	137	21.78
	41-65	293	46.59
	over 65	112	17.80
recording time	6:00-9:00	191	30.30
	9:00-12:00	72	11.30
	12:00-14:00	41	6.40
	14:00-18:00	67	10.70
	18:00-22:00	258	41.30
societal activities	chat with others	130	20.67
	dancing in the Square	163	25.91
	Exercise	107	17.01
Necessity activities	shopping	75	11.92
	working	82	13.37
	Carrying children	30	4.80
Spontaneous activities	entertainment	42	6.68

Based on the study findings on villagers' behavioural characteristics, this section expects to explore the underlying factors of villagers not initiating spontaneous activities. It focuses on the satisfaction and behavioural and psychological necessities of the village's four main public space designs. This round of research returned a total of 312 questionnaires, of which 308 were valid. According to the information obtained from the questionnaires and interviews, 34.83% of the villagers think that the design of the public space in the village now has regional characteristics; 47% of them think that the local characteristics are vital. In terms of preserving the local culture and historical landscape, the village received a positive response from the majority of the public.

Regarding public participation, 88.76% of the villagers had never or rarely participated in constructing the village public space, and about 9% were consulted. The designers did not consider the villagers' needs as necessary in the planning and design process and followed the core principle of "designing for people".

As to whether they were satisfied with the existing local public space, about 40.45% of the villagers expressed that they were delighted. In contrast, the other villagers chose to be dissatisfied for reasons such as low spatial participation, lack of leisure facilities in prominent places such as squares and streets, and insufficient social activities, in that order. A few villagers considered that too many tourists would affect the original life of the village. The reasons for choosing 'other' can be summarised in terms of high environmental noise, distance and poor visual sensation.

Table3: The score for the area that villagers would most like to improve (out of five and multiple choices)

Option	Quantity	Score
Convenient transportation	79	4.17
Relaxing environment	90	4.32
Great visuals	136	4.41
Cultural inculcation	118	4.38
Interactable facilities	192	4.63
Good sensory experience	140	4.47
Recreation and Leisure	166	4.5
Gathering activities	83	4.29
Communicating with people	61	4.02
other	12	3.63

The four types of public space were categorised in satisfaction and summarised as follows: the square is the most desirable space for villagers. However, it has much-hardened space, lacks leisure facilities, and hassle-free parking. The main road is not divided into pedestrian and vehicular traffic and is adjacent to the residential area, which poses a safety hazard to villagers and pedestrians. Although Old Street retains a relatively intact historical appearance, there are no businesses or public facilities in the area to keep visitors occupied, and therefore the neighbourhood lacks pedestrian traffic.

#### IV. DISCUSSION AND CONCLUSION

As a historical village, YJQ has the heritage and characteristics and a specific foundation of village construction, which serves as a better sample in the excavation and presentation of local culture. According to behavioural observations and satisfaction research data, the study revealed that environment-behaviour in YJQ's public spaces is dominated by social and necessary activities, with few spontaneous activities. Villagers' daily activities are mainly social and necessary, with few spontaneous activities, which is the current situation in most rural areas in China. Based on this, the situations of the square, water, and street space were further clarified through questionnaires and interviews with villagers.

Public space is the carrier of the social and spatial hierarchy of the rural. Improving locals' satisfaction and participation, stimulating rural vitality and reshaping rural social relations will be inevitable challenges in rural revitalization. Environment- behaviour studies aim to stimulate designers to identify the psychological

needs of people moving in a particular environment so that they can comprehend the behavioural characteristics of that type of space and ensure the effectiveness of the design.

The theory of environment-behaviour has brought about a breakthrough in this dilemma. This research introduces the theory of environment-behaviour into the design of rural public spaces. According to the data, the reasons for the lower utilisation of public space are divided into objective and subjective. The objective reasons are mainly the followings: lack of public facilities, too much-hardened areas and unreasonable road planning; the subjective side boils down to two points: villagers' shared sense of participation in the space design process and lack of collective activities. In China, collective activities are the bond that strengthens social relations in the countryside. In general, the underlying causes result from barriers between designers and users. Adequate consideration of villagers' behavioural and psychological needs in public spaces is key to the effectiveness of the design.

In the following study, we will apply psychological methods to explore the internal influencing mechanisms that trigger residents to engage in autonomous activities and to promote a virtuous cycle of mutual influence and development between humans and the rural environment.

### **REFERENCES**

- [1]. Cheng Zhang, Loss and Rebuilding: Construction of Rural Public Space in the Post-Native Society[J]. Study and Practice, 2018(04):108-115.
- [2]. Bin Li, Theory of Environment-behavior and Its Development in Environment-behaviour Studies[J]. Architectural Journal, 2008(02):30-33.
- [3]. Bin Li, Environment-Behavior Theories and Design Methodology[J]. Journal of Human Settlements in West China, 2017,32(03):1-6.
- [4]. MOORE G T. New directions for environment-behavior research in architecture[M]// SNYDER J C. Architectural research. New York: Van Nostrand Reinhold, 1984: 95-112.