Research Paper

Using Photovoice Method to Explore the Female Freshmen's Place Attachment on the Campus

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Abstract

University campus has a profound impact on the growth and development of college students. In this study, we use Photovoice method to explore how female freshmen perceive and build up the sentimental ties with the campus. Participants (n=54; aged 18-19 years) were asked to photograph and discuss perceived positive/negative places on Tongji University campus (Shanghai). In the process of analysis, thematic and content analysis was conducted by natural language processing software, the correlation of key words were examined by Rost Content Mining. The study shows that place attachment comes from the fulfilment of activity demand, which is not only related to the place function itself, but also caused by people's place cognition and emotional experience. Architecture, roads (and its affiliated facilities), greening and landscape, public space, and atmosphere are particularly important for creating place cognition and emotional experience. Meanwhile, Photovoice, as an emerging participatory research method, shows great potential in the place-making, as it significantly improved the students' participation, critical thinking and constructive suggestions in this campus study.

Keywords

Place Attachment, Photovoice, Built Environment, University Campus, Female College Freshmen

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University is the starting point for college students to live independently and enter society. The university campus is the main place for college students' daily life and study, so it has a profound impact on the growth and development of young students. From a familiar home environment to an unfamiliar university campus, college students need to face a series of challenges in the process of adapting to a new environment, which means that the university campus plays a role that cannot be neglected^[1]. Studies show that "difficulty of adapting to an environment" is an important reason for many college students' dropout and academic difficulties^[2]. Freshmen who have just stepped into the stage of higher education are more prone to psychological disorders, among which female

freshmen with relatively low self-efficacy^[3] are more susceptible to psychological problems such as depression and anxiety^[4]. Therefore these female students will have trouble adapting to a brand new environment^[5]. In this study, we applied Place Attachment theory and Photovoice method to explore ways of optimizing place experience among the female freshmen from Tongji University in Shanghai.

1. Place Attachment

Different from the space or environment which makes a general reference, place has distinct function, usage and meaning^[6]. The Place Attachment theory, born in the 1970s, emphasizes person-to-place bonds based on emotion (mood, feeling), cognition (memory, meaning, knowledge) and practice (action, behavior)^[7]. A two-dimensional research framework has been formed in recent years which consisting of place dependence and place identity^[8]. Place dependence refers to the individual's attachment to the environmental function, that is, the degree to which the material environment can satisfy the subject's needs^[9]. Place identity refers to the unique sense of value of a familiar place that people obtains from the place via thoughts, emotions, experience, etc^[10]. Started from the beginning of this century, the place attachment theory has been continuously developed: Kyle et al. proposed a three-dimensional research framework composed of place dependence, place identity and social bonds^[11]. Scannell et al. put forward a three-dimensional person-process-place organizing framework^[12]. Hammitt et al. added place familiarity, sense of belonging and root complex to the classical two-dimensional framework, then put forward a five-dimensional research framework^[13]. The above theoretical models cover different aspects of a place's physical space aspects, social environment connotation, individual psychology and emotion. The core common idea of them is that a subject's place attachment is closely related to his self-identification and emotional experience, which reflecting subject's emotional attachment to material space elements.

It is worth noting that previous studies based on the place attachment theory mainly focused on the subject's environmental psychology behavior, and the corresponding social construction process^[14]·^[15]. Most of the environmental elements of the place itself are only used as background conditions and rarely explored in depth. At the same time, survey methods such as scales or interviews commonly used in previous studies inevitably have preset structured content, which in different degrees limited the study findings. Additionally, most of them tend to ignore human emotions and prefer human behavior and cognition^[16]. For this reason, we introduce a new participatory method in this study --- Photovoice method, and try to encourage campus users to evaluate and reflect on the environment by motivating them to select place issues on their own.

2. Photovoice

2.1 Study method

The photovoice method records and discovers the cognition and opinion of study objects on specific issues by organizing them to take photos and discuss, and then helps individuals and communities promote changes through social practice^[17]. The main features of the photovoice method includes that: ① The participants choose and record the issues independently, which means the issues reflected are not (or less) affected by researchers; ② Photos are extremely helpful to the representation of the place experience during the interviews or group discussions, as they are beneficial to the systematically explanation and the restoration of participants' environmental experience; ③ The critical discussion based on a specific scene can provide orientation for intervention. To sum up, the superiority of photovoice in promoting public participation and practical actions has made it hailed by Western academia as the most noteworthy community participatory action study method in the 21st century.

Different from empirical research carried out in accordance with a set of commonly used models or procedures, the photovoice method focuses on explanatory understanding of the study object, rather than verification of a research hypothesis. In other words, the photovoice method does not deliberately seek evidence based on study hypothesis, but combines and generalizes the collected data in order to gain insights into the research problem by using inductive method. It can be said that the photovoice method essentially follows the *reflection rationality* as opposed to the *technical rationality*. In this study, female college students experienced a process of place identification and reflection; at the same time, the researchers also obtained the orientation of campus environment optimization during the process of constructing systematic knowledge of the campus place.

2.2 Study process

The application of photovoice method to study usually includes four stages: study preparation, information collection, data analysis and study output. In the study preparation stage, the project team mainly completed study topic selection, study site determination and participants' recruitment. As the study site, the main campus of Tongji University covers an area of about 71hm². The site includes teaching area, living area, activity area and service area, which can meet the daily life and study needs of college students. We recruited 54 female freshmen from different majors on the platform of the optional course "Female Growth" for liberal education in Women's Faculty of Tongji University. All participants are over 18 years old, possessing a mobile phone that can take photos, and signed an informed consent agreement to participate in the study. At the first meeting, the project team introduced the purpose, content, and method of the study to the participants, and asked the female students to take 10 photos that created positive experience and 10 negative experience during the follow two weeks.

After completing the photo shooting task, 54 female students were divided into 6 groups to conduct the photo-based interviews. Participants were once again asked to select 3 most representative photos from 10 in order to improve the representative of the issue and reduce repeating contents. Then, the researchers used five questions to guide the interview. The five questions were as follows: ① When and where did you take this photo? ② How did you feel when you took it? ③ Which elements brought you that feeling? ④ What reason brought you there? ⑤ From the perspective of improving your experience, how do you suggest to make this place better?

Figure 1 The study scope in the main campus of Tongji University

Figure 2 Group interview scene

Resource: YU Y.F., ZHANG Q.L.

The researchers noted and recorded the participants' narration and group discussions, and then converted audio files into text data. 324 texts were finally encoded and transcribed in combination with the corresponding photo data for the purpose of value digging and systematic analysis.

3. Place Study Based on the Photos and the Interviews

3.1 Ways and themes of campus place perception

In order to identify themes related to the places, we used natural language analysis software to process the text information. The top 50 high-frequency words closely related to environmental descriptions mainly involved elements of functional buildings (such as library, dormitory, cafeteria, faculty), elements of road and its facilities (such as the roads, sidewalks, seats, street lights), elements of greening and landscape (such as lawns, trees, squares and water bodies), elements of public space (such as playground, square, pavilion, as well as atmosphere elements such as sunlight, light, color, smell). These frequently appearing words helped the researchers to understand the participants' perceiving ways of campus places and to extract environmental themes that influenced place experience.

A further semantic network analysis of the text data shows that there is a network-structured connection between various environmental themes (Figure 3). For example, when the participants

talk about *building*, they often refer to the building and the elements attached to the building such as lawn and sunlight; when talking about *roads*, they usually also mention elements such as the planned destination, road ancillary facilities, and lighting at the same time. Obviously, place experience does not come from a single environmental element. However, the diversification of elements does not necessarily bring about a positive place experience. Research shows that the combination of elements and the quality of independent elements have a key impact on the cognition and evaluation of places.

Figure 3 Semantic network analysis via Rost Content Mining software

Resource: YU Y.F., ZHANG Q.L.

The positive place experience comes from the satisfaction of the participants' activity needs and the positive emotional experience simultaneously. For example, a brightly lit library produces motivations to hardworking, a college student club room brings a sense of belonging to the members. On the contrary, a messy corner of the green space causes sense of anxiety and insecurity, and it is manifested in behavior as rejection and avoidance.

3.2 Analysis of campus environment elements and place characteristics

On the basis of the transcription and encoding of photos and texts, we finally obtained five environmental themes as follows: building, road and its facilities, greening and landscape, public space and atmosphere elements (Figure 4).

Figure 4 Environmental themes influencing female college students' campus place experience

Resource: YU Y.F., ZHANG Q.L.

(1) Campus building

The elaboration on the building theme involves function, facade, space, etc. The scene shows by participants contains rich activity experience and strong emotional value. For example, "The library was brightly lit. It created a solemn and strong learning atmosphere and made me feel the charm of knowledge", "When eating my breakfast in the cafeteria, I looked up, and saw the sun, soft chairs, a cat, and green plants outside of the window. All these awoke a particular comfortable and warm feeling." The academic challenges and the psychological stress caused by the environment are also revealed in the building theme. For example, during the lunch time, "you often face waiting in a long line and then noticing that the cafeteria is full that nowhere to sit, then you have no choice but wait for someone else to finish before you can sit down", this makes the freshmen feel somehow embarrassed.

Table 1 Place experience on campus building

Positive place experience

It was really dark that day, but I saw the lights in the library shining brightly. It created a solemn and strong learning atmosphere and made me feel the charm of knowledge.	When eating my breakfast in the cafeteria, I looked up, and saw the sun, soft chairs, a cat, and green plants outside of the window. All these awoke a particular comfortable and warm feeling.
Negative place experience

This photo is taken in a classroom during an advanced math course. It gives me a depressed feeling. The classroom is big but empty, the windows are small, and the microphone doesn't work well. It make me feel a bit dizzy.	When you have lunch in the canteen, you often face waiting in a long line and then noticing that the cafeteria is full that nowhere to sit, then you have no choice but wait for someone else to finish before you can sit down.

(2) Campus road and its facilities

The overall evaluation of the campus road is positive. As pedestrian and vehicle system has been spatially independent on the campus since 2018, the campus walkability has been greatly improved. The road behind the library (Guanhou Road), which extends from the library to the dormitory area, is well loved for its dense buttonwood shade and abundant leisure spaces on both sides. Since many campus activities such as students club activities and art exhibitions often held here, the road space also provide students with opportunities to integrate into campus life, obtain information, and it add some positive psychological implications. In comparison, the road that lies in front of the library between two mainclassrm buildings is considered "not comfortable to walk" ", "likely to fall" for its uneven ashlar pavement, although it is also well sheltered by greenings. As this paved road is the only way for students to travel between the main classroom buildings every day, the repeated negative experience deepens the participants' negative cognition of the place.

Table 2 Place experience on campus road

Positive place experience

<p>Guanhou Road is the road I walk to class every day. It is straight, wide, well planted, makes me always feel comfortable. I took this photo on the way back from class. At the sight of the fallen leaves floating to the ground, everyone walked very slowly and I felt very peaceful and beautiful.</p>	<p>I like the Sakura avenue very much. During blooming season, it is extremely beautiful. Even though it isn't blooming season now, I still can feel the beauty of Sakura. I pass here every day when I go back to the dorms, and this place makes me feel happy.</p>
Negative place experience

<p>The paved road is uneven, I always worried get my feet hurts, especially when I wear high heels. It is not comfortable to walk or to ride bicycle on it.</p>	<p>There is a slope here. The pavement is slippery, and it is likely to fall in rainy days. I have slipped to fall here before, and so did several of my classmates.</p>

(3) Campus greening and landscape

Trees and green spaces are important factors that constitute a positive place experience. Green spaces with recreational functions are especially popular among female college students. "The large lawn at the entrance of the dormitory looks particularly pleasant. When I took the photo, some children were playing on it. The atmosphere was peaceful and warm." However, the participants appear quite sensitive to the unmaintained greenings and water. Things like lawns damaged by trampling, water bodies that have not been cleaned up in time cause discomfort and rejection, even feelings of insecurity to the participants. (Figure 3)

Table 3 Place experience of campus greening and landscape

Positive place experience

<p>The green grass is lush and the sunshine is bright. The lawn in the sun looks warm, the tree shade and the lawn set each other off very beautifully. The ceremonial column on the lawn is the symbol of Tongji University. There is often someone basking in the sun and taking pictures around, which makes us full of longing and trust for a bright future.</p>	<p>There is always someone sitting on the big lawn in front of the dormitory, playing guitar, playing board games, watching the moon, taking a picnic or dating. It awakes a pleasant sensation. That swing is very popular and makes us feel particularly relaxed and comfortable. It would be better if there were more seats and recreation facilities.</p>
Negative place experience

<p>This is a corner of the lawn next to the basketball court. It was turf before, but now there is no grass because many people take short-cut across the green land. The ruined lawn is unsightly and disturbing.</p>	<p>The water in the central lake is rather dirty, the plants on the bank seem a little wild. There has no fence on the water's edge, so you must be careful not falling into the water. There are also many insects, which cause uncomfortable. I am a little afraid to go there.</p>

(4) Campus public space

Appropriate scale, function and beauty are the main factors for a public space to be recognized by the participants. The small recessed yard on the side of the W Building (classroom building) is evaluated as follows: "it gives a very peaceful and scholarly impression. The trees and the benches under the trees awake a very comfortable sensation." However, for the adjacent T Building (classroom building), the recessed yard is considered as a negative space by many participants due to its excessive enclosure, lack of sunlight and solemn plantation. They felt "inexplicable anxiety and discomfort... would not enter it."

Table 4 Place experience of campus public space

Positive place experience

<p>I'm impressed by the small courtyard behind W Building. It gives a very peaceful and scholarly impression. The trees and the benches under the trees awake a very comfortable sensation. My classmates and I often rest or hold group discussions here. The sunshine was very good on the day when the photo was taken. I saw a classmate sitting there and felt a peaceful harmony.</p>	<p>The pavilion next to the graduate school has beautiful scenery and a quiet environment. It is large, people can sit in it. Many of the students' club activities are held here, such as distribute performance tickets. We can also feed (stray) cats by the way.</p>
Negative place experience

<p>The courtyard of T Building is quite clean, but I don't like the atmosphere. The building is high, the tree trunks are thin and tall, so the sunlight can't get in and it makes us feel depressing. There is a heavy stone in the end of the yard, engraved with weird words ... This yard makes me feel inexplicable anxiety and discomfort, I would not enter it.</p>	<p>This pavilion is exposed to the sun, you feel burnt, isn't it? Without tree shade or shelter, the seat outside of the pavilion is exposed to the sun and rain. It's hard to understand why put a seat there, of course everyone goes to sit inside.</p>

(5) Campus atmosphere elements

In addition to the theme of physical entities, environmental elements frequently mentioned by the

participants also include sunlight, light, weather, temperature, smell, etc. For example, in front of the dormitory building door in the early morning, "the sun shined through the treetops, it awoke a warm and comfortable sensation." However, near the gymnasium in the evening, "there is nobody and no adequate lighting when it gets dark, so I feel a bit unsafe to pass by. "Although the elements that make up the environmental atmosphere are not under control, they have an impact that cannot be underestimated on the mental health and place experience of female college students. It is worthy of wisely use in the environmental design.

Table 5 Place experience of campus atmosphere

Positive place experience

I took this photo at the main gate of Tongji University when I came out of the subway one night. The distinctive lighting illuminates the walls, it's beautifully. Walking back along the lights made me feel like going home with pride.	The photo was taken when I went out of the dormitory for class on a Monday morning. As soon as I went out, I saw the morning sun shined through the treetops, it awoke a warm and comfortable sensation.
Negative place experience

The animal lab often emits peculiar smell, and I feel very uncomfortable every time when I pass by.	Behind the gymnasium, there is nobody and no adequate lighting, so I feel a bit unsafe to pass by when it gets dark. Moreover, there are sharp corners protruding from the lawn, you will trip if you don't see them.

3.3 Campus place system

According to the 162 photos that reflect positive experiences and 162 photos that show negative experiences taken by the participants, we carried out a nuclear density analysis of the photos location based on GIS platform. The result shows that the positive place experience mainly comes from the university core zones such as the library and its surrounding areas, the neighboring of the main gate(on Siping road), central lake (south side), the lawn of the southwest dormitory building, and the periphery of the sports field. These places are closely connected in space (Figure 5). On the other hand, the negative place experiences mainly concern the east of the library, the living area on the southwest side of the campus and central lake (north side), as well as the campus hinterland and edge. These places are scattered in the campus and loosely connected (Figure 6). The main campus functional areas are distributed near the central axis extending from the main gate of Siping Road to the west. Whether for active or passive reason, college student activities are most frequently exposed there. Therefore, they are the core part for campus atmosphere optimization. Research shows that it is of great significance to create a spatial hierarchy and a high-quality place sequence in accordance with the students' activity patterns. This would help to foster place attachment on the campus by providing continuous positive place experiences. Comparatively, the areas where the negative place experience reported by the participants constitute the objects to which we should pay special attention in the campus renewal.

We notice that the location of photos reflecting the positive and negative place experience seem to overlap in the library and the living area in the southwest. After comparing the specific photos and text data, it is found that the specific scenes respectively reflected by the positive and negative experience are not the same. The positive experience of the library is mainly concentrated on the building itself and its surrounding green space, while the negative experience comes from the stone pavement in front of the library, and the slightly dim path beside the library. The positive experience of the living area in the southwest is mainly concentrated on the lawn in front of the southwest dormitory building, while the negative place experience mainly comes from the dormitory area on the south side, where are often crowded in rush hour and no greenery and recreation facilities. In addition, among the three gates of the campus, only the main gate on Siping Road brought positive experience, and the other two gates seem not friendly enough to the participants.

Figure 5 Positive place experience distribution

Figure 6 Negative place experience distribution

Resource: YU Y.F., ZHANG Q.L.

4. Discussion and Implication

4.1 Cultivation of campus attachment

The consequence of place attachment is a tendency to stay or approach. Willingness to stay or approach depends on whether people could obtain a positive experience of the place. On the other hand, a positive place experience could in turn encourage people to keep visiting a place, so that form a benign interaction between people and place. A coincident environmental experience cannot build up place attachment, but the continuous emotional investment and repetitive practice will do. The regular-activity-based process forms the basis for individual to adapt to a new environment and establish corresponding order, so called time-space routines^[18]. As the space carrier for freshmen to form the time-space routines, both positive and negative place experience will have a long-term and continuous impact on their college life. Aiming at the remarkable regularity of daily activities of college students, we should attach great importance to the sequence and hierarchy of places, in order to create a continuous positive experience during the campus environment design.

In the process of adapting to the campus environment, freshmen need not only functional support, but also emotional support and social adaptation. Human beings tend to have an instinctive rejection to unfamiliar places, which is the result of subconscious self-defense. Freshmen who just left their parent often lack the experience of independent living and therefore urgently need support from the new environment. The time-space routines can make up the psychological anxiety to a certain extent, help individuals gain a sense of control over the environment, and further form mutual support between peers. In this study, the evaluations contain not only the freshmen's satisfaction of the campus environment, but also their psychological response to the campus atmosphere. The

emotional response caused by spatial dimension, plants, sanitation condition, activities, and even light and smell, reflect the sensitive characteristics and delicate psychological needs of the female freshmen. This reminds us that creating a friendly campus requires not only the attention to the physical elements, but also the non-physical factors such as lighting, sounds, smell and other natural factors with positive psychological suggestion. In addition, the maintenance and management should be highlighted, in order to strengthen the image of safety, comfort, and friendliness.

4.2 Value of Photovoice method

The photovoice method in this study showed the following advantages: the photos taken by the participants reflect abundant environmental themes which came from the personal experience, they helped to learn more about the tangible/intangible value of place without limitation by inherent knowledge. The participants' narrative facing the photos highly restored the immersive experience, which contributed to reflect the different effects of environmental elements, the combination of elements, and other details. The image data and text data are complementary and rather completely reflect the different dimensions of campus place attachment. Its significance is not only to help researchers gain a deeper understanding of the campus, but also to stimulate the students to think critically about the places and to generate constructive suggestions.

The photovoice method is characterized by high participation and strong action orientation. It is an important supplement to traditional planning research and community renewal methods. We completed the information collection in October 2019 and then finished the data analysis in December 2019. According to the original plan, the results would be publicly displayed on campus in the spring semester of 2020 and collect feedback. However, affected by the Covid-19 pandemic, we had to cancel this public display and chose to present the research results on the university liberal education online platform. Despite this, we successfully communicated with the university authorities and service operators, and was invited to present our work on the working meetings of the campus renewal department.

5. Conclusion

The friendly campus aims not only at a neat and beautiful physical space, but also at a positive place experience. As a testimony to important life stages, the campus environment usually leaves a lifetime memory for college students. It is of great significance to the cultivation of talents and the inheritance of campus values. We believe that in the effort to create a friendly campus environment, the place experiences of the students are the most noteworthy voices.

6. References

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