Research on the Design of Aging Leisure Landscape in Community

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Abstract. In order to investigate the aging life needs of the old community square in Beijing, the factors influencing the daily communication space of the elderly were obtained. Based on the analysis of the current situation of community square for the elderly in Beijing, this paper puts forward the principle of public, social and private communication space, and classifies and reorganizes the activity space and designs and constructs it. Taking Beijing Bell and Drum Tower Square as an actual case, this paper analyzes the space renewal strategy, explores and perfects the orderly old community square function and the improvement design of square space. This paper puts forward the existing problems and suggestions in the layout and construction of old urban squares in Beijing, so as to update and improve the functions of community cultural squares.

1. Introduction
With the continuous development of science, technology, economy and culture in the current society, China's cities are also constantly developing. Community square, as an important place for people's leisure activities, is particularly important for the elderly due to its high frequency of use and convenience. Therefore, expanding the new functions of the community square and providing the square with the nature of health and leisure for the elderly is one of the key points in the transformation of the old community. In the process of the reconstruction of Beijing's old urban areas, there will be many conflicts between the original internal space and the space to be reconstructed, and the situation of the internal space is also very complex. Therefore, the reconstruction of the old urban areas will not only directly affect the development process of Beijing city, but also directly change people's way of life[1]. In the actual design process, it is necessary to draw lessons from some successful design cases and study the main space of community activities for the elderly. From the perspective of the percentage of global aging, China's aging population is not the highest [2], but from the total population, China's aging population is a rapidly rising trend, therefore, in the future, there will be a need for more activity places in urban areas in China, and a separate demand for community activity facilities for the elderly is also on the rise.

2. The Present Situation of the Old Community Square
2.1 The Satisfaction Analysis of Old Community Squares in Beijing
This paper is written according to the List of Communities to Be Renovated in 2012 for the Comprehensive Renovation of Beijing Old Communities, and representative old communities or community squares in Beijing, such as Hepingli, Xinyuanli, Zhonggulou Square and Shuangyushu, were selected for practical investigation. Combined with questionnaire survey and field investigation,
relevant data were summarized after analyzing and sorting out the obtained data. The SD semantic method commonly used in psychological measurement was used for analysis and evaluation, and the evaluation factors were composed of multiple pairs of antonyms. Within a given rating range, respondents rated each item according to their own subjective feelings. In this paper, based on how people feel in space and how they use space, factors were selected from five aspects: Aesthetics, scale, function, facilities and traffic stream line, and 13 evaluation items in five categories were finally drawn up (see Table 1). The evaluation items were assigned seven ratings, namely 3, 2,1,0, -1, -2, -3. The weighted average of the statistical analysis is the satisfaction degree of the old community squares in Beijing.

| Evaluation Elements | Evaluation Factors | Evaluation Scales | Community Square Score |
|---------------------|--------------------|-------------------|------------------------|
|                     |                    |                   | Single Item | Total Score |
| Aesthetics          | Degree of landscape aesthetics | Beautiful - Ugly | 1.15 | 3.15 |
|                     | Lively degree of colour | Lively - Stiff | 2 | |
| Scale               | Degree of overall coordination | Neat - Messy | 0.55 | -1.1 |
|                     | Activity space | Sufficient - Deficient | -1.65 | |
| Facility            | Perfection of service facilities | Well-equipped - Defective | -0.8 | -1.3 |
|                     | Comfort of public facilities | Comfortable - Uncomfortable | 0.75 | |
|                     | Richness of structural forms | Copious - Monotonous | -0.25 | |
| Function            | Shade degree | Shady and cool - Exposed to the sun | -0.65 | |
|                     | Climatic suitability | Suitable - Not suitable | 1.55 | 5.55 |
|                     | Cleanliness | Clean - Messy | 2.35 | |
|                     | Degree of safety | Safe - Dangerous | 0.85 | |
|                     | Degree of participation in an activity | Participant - Difficult to participate | 1.45 | |
| Traffic stream line | Traffic accessibility | Convenient - Troublesome | -0.4 | -0.4 |

Through the analysis of SD method quantitative questionnaire, the psychological needs of users and how the old community square meets such needs were understood. In this study, a total of 80 questionnaires were distributed (see Table 1-1), and 77 were recovered, with a recovery rate of 96% and an effective rate of 94%. By calculating the average value of each evaluation factor, the SD score of the old community squares in Beijing was calculated (see Figure 1). The current satisfaction analysis of the old community squares in Beijing is as follows:
Figure 1. SD Factor Satisfaction Analysis of Old Community Square

It can be seen that for the old community square, the most urgent problems to be solved include: the reduction of the number of activity space; insufficient open space facilities; a smaller and single-function site area.

2.2 Principles of Landscape Transformation of Old Community Squares in Beijing

Through the Five-Point Likert Scale, the 12 evaluation factors of the satisfaction evaluation of the old community square in the questionnaire were scored. The evaluation levels were divided into five levels (very poor, poor, general, good, very good), and were assigned to 1, 2, 3, 4, and 5 respectively. Finally, the questionnaire results were input into Excel for descriptive statistics, and on this basis, the mean value and correlation analysis of the main factors involved were carried out to find out the main influencing factors for the elderly to choose their leisure space, and the quantitative evaluation results were obtained.

The evaluation factors of this study are divided into two levels: four first-level factors, including spatial perception, supporting facilities, sense of security and belonging, and landscape perception (A-D in Table 2); thirteen second-level factors (X1-X13 in Table 2).
Table 2. Factor Analysis of the Use Evaluation of the Old Community Square

| Level 1 Index | Level 2 Index (Variable) | Mean Value | Comments | Standard Deviation |
|---------------|--------------------------|------------|----------|-------------------|
| A Space Perception | X1 Do you think this space is in the right place? | 3.22 | Good | 0.96 |
| | X2 Do you find it convenient to come to this space for activities? | 3.65 | Good | 0.69 |
| | X3 Do you think the space has a broad view? | 4.06 | Good | 1.02 |
| B Supporting Facility | X4 Do you think the space has complete facilities for daily recreational activities? | 2.92 | General | 1.05 |
| | X5 Do you think the design of the infrastructure of this space can meet your needs? | 3.98 | Good | 0.67 |
| | X6 Do you think the setting of recreation facilities in your space is reasonable? | 2.89 | General | 1.24 |
| C Sense of Security and Belonging | X7 Do you think the space is convenient for you to communicate and interact with others? | 4.17 | Good | 0.80 |
| | X8 Do you find your space convenient for activities? | 4.09 | Good | 1.09 |
| | X9 Do you think your space is worth having a rest and recreation with your family? | 4.00 | Good | 1.00 |
| D Landscape Perception | X10 Do you think the greening of the space is beautiful? | 4.05 | Good | 1.06 |
| | X11 Do you think the climate of your space is comfortable? | 2.41 | Poor | 0.65 |
| | X12 Do you think the management and maintenance of your space are in place? | 2.89 | General | 0.71 |

As for the above contents, according to the data, elderly people's choice of leisure space is relatively unified in terms of "Space Perception", and they have a great demand on whether the location of leisure space is reasonable, whether the transportation to the leisure space is convenient and whether the vision of the leisure space is wide; in terms of "Supporting Facilities", two variables X4 and X6 are rated as "general", reflecting that the elderly have a great demand for facilities when choosing leisure space, while the supporting facilities in the current community square obviously fail to meet the needs of the elderly; in the column of "Sense of Security and Belonging", X9 variable is "general", which reflects that the current security of the community square is poor and it is urgent to solve such problems for the elderly; In the column of "Landscape Perception", X12 and X13 variables show that the current climate of the old community square is unable to meet the daily needs of the elderly due to the lack of corresponding maintenance and management.

2.3 The Needs of the Elderly for Public Communication Space

The satisfaction of the need to be noticed. The public communication space is set near the courtyard, the entrance of the Hutong, the entrance of the peddler's area and the square, so that the elderly can be paid more attention to on the one hand, and they can get more useful information in their leisure time.

The satisfaction of a sense of domain and security in the elderly. In the actual design process of the public communication space for the elderly, the leisure space was set on one side of the wall or under a tree, which can not only better protect the elderly from wind and rain, but also create a three-dimensional feeling.

A focus on the practicality of design. In the actual design process, the elderly's recreational activities are enriched through the setting of infrastructure, and the structure and size of infrastructure can better meet the standards of the elderly by combining ergonomics, such as setting some handrails and U-shaped seats to help the elderly interact.

Uniform distribution of active areas. According to the relevant data, when choosing most of the spaces, the elderly will mostly choose the activity areas close to home and comfortable environment, so the activity square near the residential area is favored by everyone.
3. The Spatial Renewal Perspective of the Old Community Square

3.1 Analysis of Actual Case Design
In addition to being a square with rich historical deposits, the proportion of the elderly near the "Bell and Drum Tower Square" in Beijing is relatively large, showing the characteristics of aging development. The walkways on either side of the square, where tourists often lie down to chat, have plenty of electric cars and tricycles to park. There are often some vehicles and shared bikes parked in the main square, most of the time the space is empty, and sometimes some decorative potted flowers are put here, so the utilization rate of the space here is greatly reduced. Through observation and based on the needs and hopes of the surrounding elderly, the foundation of the site needs to be transformed, so that the needs and hobbies of the elderly in the east and west Hutongs are more obvious.

3.2 The Renewal Strategy of Landscape Reconstruction Design of Beijing Bell and Drum Tower
According to statistics and inquiries, the most popular shape among the elderly is the circle, because it represents "completeness, happiness, harmony, family joy, roundness, and nature." Therefore, in the design of the square, the concept of "circle" was introduced and its functions, such as board games, shuttlecock kicking mode and square dancing mode, were added on this basis until they were perfected, and its mobility was also included, thus increasing the number of users of the square. This design can be copied to other community squares in Beijing. In the replication process, different facilities can be coordinated and delivered according to the number of elderly people in different regions and regional preferences, while preserving the free-moving public areas.

![Schematic Diagram](image)

**Figure 2.** Design Drawing of Modification Scheme

4. Conclusion
To sum up, as China is gradually stepping into an aging society, most Hutong blocks have become the gathering places for numerous elderly people, and attention has been paid to the design of the space around Hutong blocks, because the needs of elderly people will attract more and more attention from the whole society. The design and planning of the activity space in Beijing's old hutong blocks will be paid attention to by people in the industry, so the functionality of the existing square will be increased to strengthen the role of the old community cultural square in Beijing.

5. References
[1] Yan Cancan. Analysis and Design Research on the Living Auxiliary Needs of the Empty-nest
Elderly [J]. Design, 2020(19):13-15.
[2] Zhang Wenying, Feng Xiliang. Significance of Inclusive Design for Public Space Construction in Aging Society [J].Chinese Gardens, 2012(10):30-35.
[3] Chen Chen, Guo Yajie. Study on the Relationship between Community Belonging and Environmental Satisfaction of the Elderly [J]. Urban Architecture, 2019,16(27):67-68.
[4] Wang Yan, Sun Yue, Ma Xuesha. Research on Environmental Renewal Strategy of Public Space in Urban Communities [J]. Design, 2016 (5): 146-147.
[5] Gu Gong, Zhao Wenchen, Niu Xiaotian. Analysis on the Planning and Design of Community Pension Service Facilities [J]. Anhui Architecture, 2019, 26(10): 76-77.