Research on the Design Language of Planting Landscape in the Environment of Chengxiang District, Shanghai

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Abstract. This Research investigates the planting landscape in the environment of Chengxiang District. The method of visual simulation has been used, and questionnaire survey has been conducted to obtain the visual perception identity of respondents on different forms of planting in different environments. With the statistical analysis, we can get the design language of planting that the respondents have a sense of identity. The results show that the combinations of planting species identified in the environment of Chengxiang District, Shanghai, include: local planting species with extensive line branches are easier to get identity in the environment of Old Chengxiang District; cluster planting can better reflect the vitality of business atmosphere at Shikumen; delicate planting texture and bright color can make people have the identity of local Shanghai culture. Based on these design language, this Research tries to integrate it with the urban environment, so as to make the urban planting landscape inherit the urban context spirit and gain a sense of identity in the renovation of small-scale urban landscape.

1. Introduction

Planting design is a crucial link in the landscape design. The design shall be able to give full play to the interaction of all planting, so that the visitors can further obtain more complex psychological experience through visual perception. Because of their life, plants can always accompany and record the things that happen and change in this land. Plants hold the emotion and spirit of this land, objectify and spatialize the people's memory, and then make people have a sense of identity and belonging to the place, that is, the so-called "place spirit" [1].

2. Overview of design language of planting

Due to the cultural differences between the East and the West, the people's understanding of planting has geographical or regional differences. The East tends to express the emotion of planting with metaphorical verses. However, the West describes the planting more directly through the perception of senses.

2.1. Situation of planting in the Chengxiang District of Shanghai

Influenced by the historical environment, the architectural environment of Shikumen in the Chengxiang District is connected by many small areas of plant environment. Shanghai native species such as catalpa, pterocarya stenoptera, metasequoia, paulownia, etc. were predominating. This planting pattern is
different from modern cities, which can provide clear hints for visitors and show the difference between the native land and the modern urban environment.

2.2. Design language of planting
The design language of planting refers to the classification characteristics of design, including scale, visual balance, light and shadow changes and the place spirit of plants in the environment. There are many researches on the aesthetic character relationship between plants and landscape at home and abroad, such as the number of trees, color, density of branches and leaves, plant height, tree shape, DBH, crown area, macrophanerophyte coverage, skyline of trees, number of rows planted, and number of trees, all of which directly or indirectly have an impact on the aesthetic character of landscape or the emotional experience of visitors [2-6].

3. Relationship between the design language of planting and the environment of Chengxiang District

3.1. Surveyed samples
According to the flow rate of visitors and the number of people staying, photographing and framing in the Chengxiang District recorded in Table 1, the surveyed samples are selected from non-popular scenic spots, among which Shanyin Road, The Confucian Temple, Duolun Road and Tianai Road are rich in plants, so as to understand the people's perception of the plants' rendering of the environment.

|                | Duolun Road | Tianai Road | Shanyin Road | Cite Bourboine | Daxing Lane | The Confucian Temple |
|----------------|-------------|-------------|--------------|---------------|-------------|---------------------|
| Persons/Hour   | 2127        | 1036        | 2268         | 965           | 635         | 2075                |
| Persons framing/Hour | 1168     | 714         | 683          | 154           | 187         | 975                 |

The areas with high flow rate of visitors are concentrated in Duolun Road, Shanyin road and The Confucian Temple, while The Confucian Temple and Duolun Road have more people framing. The results show that there is a strong correlation between the planting environment and the architectural environment, and the plant size, color, shape and architectural style in the planting design interact with each other, so as to change the visitors' identity to the scene.

3.2. Research methodology
This Research investigates the planting design of the microscale regional environment in Chengxiang District, Shikumen, and Shanghai, aiming at the tree species, crown shape, quantity, and color and rendering degree of the place. In the selection of sample sites, the selected objects cover the coexistence of local residence, tourist attractions, commercial residence and famous cultural areas in the Old Shanghai, including Duolun Road, Daxing Lane, The Confucian Temple, Tianzi Lane and Liyang Road. Five scenes were selected for each sample site, and a total of 25 groups of photos were taken.

The research subjects cover the students from Grade 1 to Grade 3 and some teachers of Shanghai Art and Design Academy. See Table 1 for specific information of the samples. A total of 200 questionnaires were distributed and 187 effective samples were collected. In addition, 15 students and 5 teachers of different majors were selected for real scene and simulation research.
### Table 2. Basic information of respondents.

| Item          | Person /time | Percentage | Item          | Person /time | Percentage |
|---------------|--------------|------------|---------------|--------------|------------|
| Occupation    |              |            |               |              |            |
| Student       | 137          | 73.26      | Landscaping   | 38           | 20.32      |
| Teacher       | 50           | 26.74      | Interiors     | 42           | 22.46      |
| Junior college| 137          | 73.26      | Handicrafts   | 34           | 18.18      |
| Education level|             |            |               |              |            |
| Undergraduate | 13           | 6.95       | Major         | 36           | 19.25      |
| Master or higher| 37         | 19.79      | Advertisements| 36           | 19.25      |
|               |              |            | Animations    | 37           | 19.79      |

3.3. Research hypothesis

According to the research content of planting design at home and abroad, the following hypothesis has been developed:

1) In the microscale spaces, the design language of planting (plant species, size, crown width and combination form) can still constitute an impressive planting structure;

2) The design language of planting renders with the architectural atmosphere of Chengxiang District and Shikumen, which plays a homological role in reflecting the urban context of Shanghai;

3) The design language of planting of microscale space in Chengxiang District can still express the local place spirit of Shanghai in the living environment of modern city, which makes the people have a sense of identity.

Based on the investigation of the architecture and planting environment in the environment of Chengxiang District, against the phenomenon of lacking urban context, this Research makes a proposal in the planting design to gradually influence the people's visual feeling and psychological identity of Shanghai through the micro-transformation of planting design in the micro-regions.

4. Research results

4.1. Results

Based on the research hypothesis, the respondents were asked to:

1) Appraise the aesthetic character of landscape of 25 samples, and score 1~10 points;
2) Select 25 samples with impressive planting structure;
3) Select the photos of planting environment that are most suitable for the site environment of Shikumen and Chengxiang and can best express the local context of Shanghai.

First, calculate the data according to the investigation of the aesthetic character of landscape (see Table 3).

### Table 3. Appraisal scores of the aesthetic character of landscape.

| Location          | Average | Daxing Lane | The Confucian Temple | Tianzi Lane | Liyang Road |
|-------------------|---------|-------------|----------------------|-------------|-------------|
| Duolun Road       | 8.72    | 8.55        | 8.34                 | 9.15        | 9.25        |

According to the statistics of the average score sheet, the respondents' judgment of the aesthetic character of landscape is affected by the size of plants, the symbolic meaning of plants, the people's psychological state, the location of plants, and the architectural form. By selecting the most influential samples of planting design, the characteristics structure of planting combination can be derived through analysis (see Table 4).
Table 4. Analysis of impressive planting combinations.

| Basic element | Application and analysis |
|---------------|--------------------------|
| Line          | The essence is plant modeling developed mainly by deciduous trees, like metasequoia and Chinese parasol. |
| Form          | In a microscale street scene of Duolun Road, the plants composed of melia azedarach, osmanthus fragrans and hypericum are more likely to reflect the spirit of place in a small space enclosed by the buildings. |
| Cluster       | At Tianzi Lane, in a micro-region in front of the stores arranged by the owners, the cluster planting landscape composed of tens individual plants with different shapes and sizes is full of the vitality of Shikumen. |
| Texture       | Different from the conventional urban planting species, catalpa and paulownia are integrated with the environment of The Confucian Temple, Chengxiang District and Shikumen with their rough texture. |
| Color         | A biocoenosis composed of robinia pseudoacacia, cherry blossom, chimonanthus praecox and coral highlights the literati sentiment living here at that time against the background buildings in spring blooms. |

Finally, 15 students and 5 teachers with different professional directions were drawn at random for field research on the impressive planting landscape. These microscale planting landscape were put into the modern environment landscape through computer image edition, so as to evaluate the application of design language of planting in the modern urban landscape. The original photos and edited photos were scored respectively, and the photos were assessed from 1 to 10 points (see Table 5).

Table 5. Application appraisal of design language of planting in the environment of Chengxiang District.

|                  | Duolun Road | Daxing Lane | The Confucian Temple | Tianzi Lane | Liyang Road |
|------------------|-------------|-------------|----------------------|-------------|-------------|
| Original photos  | 9.05        | 8.73        | 8.52                 | 9.22        | 9.32        |
| Edited photos    | 8.65        | 8.52        | 8.35                 | 8.02        | 8.72        |

Judging from the score value, the respondents can easily accept the extensive form of Shanghai native tree species, and they agree with the effect of combining and matching with different shapes and textures in the microscale space, but they do not give a high evaluation of cluster planting at Tianzi Lane.

4.2. Proposal

The purpose of this Research is to explore the planting design form with local characteristics of Shanghai in aspects of the planting type, pruning shape and color combination, so as to inherit the context characteristics and regional spirit of Shanghai. Based on the research results, the following proposals are put forward:

1) The native plants not only have the advantages of habits, but also express the local culture and characteristics;
2) The people living in the city do not want to repeat the single planting scene monotonously, but prefer the microscale planting landscape with living atmosphere;
3) The local context of Shanghai reflected by the planting language in the environment of Chengxiang District has more impact on the people's psychological perception;
4) In the architectural environment, the texture and color of planting will have a great impact on the overall environment.
5. Research results
This Research only focuses on some microscale spaces in Chengxiang District of Shanghai, so as to understand the design language of planting in the traditional environment of Chengxiang District. What a designer needs to understand is that the planting design with life characteristics and humanistic character connotation in landscape design should provide better environmental atmosphere and perception space for the visitors by the moderate and diverse combination of such planting. We shall allow the people living in the city return to the poetic dwelling and reverie space.

References
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