

Visual Environment Description and Preference Analysis Based on Reconstruction of Cultural and Creative Industries in Traditional Industrial Architecture

Fanghan Yan

Shanghai Art & Design Academy

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Abstract: Based on the description of the visual environment of cultural and creative industries, this study applies the expert model and cognitive model in visual perception research method, assuming that the environmental elements like visual control points and distances are related to visual experience, preference and description. Through the photo shooting of the visual control points, this study carries out visual environment description and preference survey on the subjects, to know how to improve the influence of the visual environment on people in the cultural and creative industries. It tests the environmental characteristics that people are targeting in the process of visual environment description, to conduct symbolized description on the visual environment, further enhance people's visual perception experience and form a positive visual impact.

1 Introduction

Since the reform and opening up, Shanghai's urbanization process has accelerated. With the continuous expansion of the city scale and continuous optimization of urban functions, the industrial enterprises originally concentrated in the city center have shut down, been merged or moved to the suburbs or other provinces and cities. The original factory areas, especially the light industrial plants, have mostly become a cultural and creative industry center and a gathering place for creative enterprises after undergoing several changes and integrations, so as to better meet or adapt to the functional needs of modern cities.

In the 1980s, the main purpose of urban planning was to move to and concentrate in the urban center. Since the reform and opening up, urban planning has paid more attention to the overall optimization of various people-oriented urban elements and functions. It involves the functional disposal and visual design of a large number of remaining industrial parks and old factories that were originally located in downtown areas or residential areas. For these remaining buildings, designers propose to make the visual performance of these architectural spaces and exterior more aesthetically pleasing. In the West, sociologists have proposed to quantify the ambiguity and complexity of urban environment ^[1], and some have proposed to conduct design evaluation for complex urban environments ^[2]. Both designers and sociologists need to perform statistical analysis of the visual effects of urban environment, to achieve better visual perception. Now the original industrial sites in the city are constantly being updated into urban creative and cultural industrial bases. On the one hand, it provides a place for industrial incubation of high technology, and on the other hand, it can also enhance the visual environment of the city, and gradually passed on the context and spirit of the city to people from a small-scale environment.

In terms of the perception, description and analysis of visual environment, compared with natural environment, urban architectural system is more integrated and unified and does not have the diversity and variability of natural environment. In the assessment of environmental vision, Gordon Cullen mentioned the concept and method of urban environmental analysis in *Townscape*, that is, the perception of urban architecture and special vision of space according to aesthetic principles ^[3]. In the visual description of architectural environment, it points out the visual perception connection among spatial elements of the building and its interior—the visual analysis elements of the architectural environment such as structure, color, texture, scale and uniqueness. In the process of

environmental visual analysis, environmental visual description analysis is gradually carried out by determining visual control points. In the space environment of old industrial sites, the image description of environmental vision is obtained mainly by random framing or by allowing the subject to take photos with subjective judgment [4]. In terms of visual elements, the records are judged according to different fields of view, range of visibility and visual height of observers, and different forms of framing photos are used to form continuous research and analysis.

Liu Fuying and others have described the influence analysis of Shanghai Creative Industrial Park, which mainly includes popularity, industrial heritage value, economic benefit, environmental quality, scale, number of enterprises, service level and number of tourists [5]. In the part of impact, the value of industrial heritage, the quality of environment and the number of tourists are all related to the visual description and analysis of architectural environment. Shanghai's main industrial sites are concentrated in Huangpu, Jingan and Changning District, which are formed by a single industrial zone or formed by several buildings. The continuous "neighborhood factories" formed because of historical and social reasons have become a feature of Shanghai.

In this study, the following assumptions were made based on environmental visual description and analysis methods.

- 1) The architectural continuity of the cultural and creative industries and the spatial scale within the region affect people's perception of environmental vision;
- 2) The complexity degree of visual environment elements is related to visual preference;
- 3) The architectural environment with historical symbols and cultural connotations has deep meaning for people's cognition of visual perception.

2 Selection of Visual Control Points and Description of Architectural Space Elements

The study selects Tianzifang as the research object. On a sunny day, along the main roads of the city, take long-distance photos of continuous building skyline outside the Tianzifang, and take mid-range photos of each individual building from the inner road of Tianzifang, and finally take short-range photos inside the building space. After deleting the photos with shooting problems, 3 groups of photos, 42 pieces, are remained, and the view content of visual control points are shown in Table 1.

Tab1 View Content of Visual Control Points

Visual element	Long-range view	Mid-range view	Short-range view
Building	Shikumen building, coherent building skyline, wall.	A single Shikumen architectural unit, facade decoration patterns, doors and windows, etc.	Interior space of building, commercial content and decoration, furniture.
street	Street scale, scale relationship between people and streets, etc.	The relationship between the street and the building, and the material of the street pavement.	The connection between the street and the internal environment of the building.
Plants	Street trees, wall-climbing plants, and balcony plants.	Plant arrangement on the external wall of the building and outside shops.	Plant decoration inside the building space.

In the course of the survey, samples are randomly selected from 14 pieces of photos of each group, to investigate the visual preference of the subjects to the internal environment of the cultural and creative industries. The preference index is evaluated from the lowest 0 to the highest 10 points. There are 30 subjects who are teachers and students majoring in environmental art design and architectural interior design in Shanghai Art & Design Academy. During the test, the subjects are supposed to describe and analyze the visual environment they see with the methods like semiotic

system [6], visibility, etc. through observing the content of the photos, and at the same time, the subjects' visual perception of the environmental quality is obtained.

3 Description of the Visual Environment in a Cultural and Creative Environment

Among the descriptions of 30 subjects on the architectural visual environment, 12 of them use the description method of semiotic system to express the continuity of the visual experience they see (Table 2 Environmental Experience Description of Semiotic System).

Tab2 Environmental Experience Description of Semiotic System

	Building	Street	Plants
Long-range view	Ten people use architectural skyline as a symbol to express the continuous visual characteristics of the building; two people use the characteristic symbol of Shikumen building to describe its visual features.	Seven people use the “Shigu” at the entrance of Shikumen as a symbol to describe the visual environment of the long-range vision of street; five people use the vehicles parking along the road and pedestrians to describe.	Twelve people use the canopy line of trees planting on the urban street, French paulownia, as the basis for description.
Mid-range view	Four people use Shikumen’s architectural outline as a visual description feature; six people use Shikumen’s dormer to describe its visual features; two people use Shikumen’s doors, windows and balconies as description features.	Ten people choose the continuous architectural line of Shikumen in the street as the description object; the other two choose the small objects and decorations of the street scene as the description object.	Six people choose the plants on the balcony of residents as a visual feature; the other six people choose the flower arrangement at the entrance of the shop as the description object.
Short-range view	Eight people conduct description according to the commercial content of the photoed shop; four people described the visual features according to the spatial division of the interior of the Shikumen building.	Twelve people all choose store descriptions and indicative signs connecting the interior space with the external environment as the description object.	Twelve people all conduct description by using internal plant decoration of business as a visual feature.

In addition to the 12 people, 18 people use a basic visual field description method—textual description of the architectural distribution, architectural form, street scale, plant height, plant distribution and plant size of long-range, mid-range and short-range view. Three subjects specifically mention the relation between the visibility of the environmental vision in the photo and the field of view and building observed at the control points in the description.

It can be seen from the objects' descriptions on the architectural visual environment of the cultural and creative industries that people tend to pay more attention to the continuous visual perception consisting of the buildings' skyline and the plants' canopy line in the long-range view. Different skylines (tortuous, smooth, sharp, etc.) influence the visual impact to varying degrees, and the echo of the two elements can enhance the visual perception of human to the maximum. In the area of mid-range view, the detailed features of the building (especially the architectural features with local characteristics) have a stronger impact on people's environmental vision. In the absence

of architectural features, the scale of the street and the color and changes of plants also can influence the attraction degree of environmental vision to people. In indoor space, the degree of association between business type and architecture has a great impact on people’s visual perception, and the business types related to building types and the business types with great contrast can attract attention to people’s environmental vision.

4 Visual Preferences in a Cultural and Creative Environment

The test divides the long-range, mid-range and short-range views in the photos into three groups, and each group of 14 samples is used to test the visual environment preference of the subjects, and the investigation is conducted based on the scoring from 0 (lowest score) to 10 (highest score). The results of the subjects’ questionnaires are shown as follows (Table 3 Survey Results of Visual Environment Preference).

Tab3 Survey Results of Visual Environment Preference

	Building only	Street only	Plants only	Building + street	Building + plants	Street + plants	Building + street + plants
Long-range view	7.3	No sample	No sample	7.1	8.5	No sample	8.3
Mid-range view	9	7.4	8.1	9.2	9.7	8.6	8.9
Short-range view	8	7	8.2	No sample	8.8	8.2	No sample

The following conclusions can be seen from the results.

- 1) The complexity of environmental elements is positively related to the visual environment preference at the beginning of the increase, and after the complexity of the environmental elements continues to increase, it begins to appear negatively correlated, and the sample surveys of long-range view and mid-range view shows the same trend.
- 2) The visual preferences of cement buildings and Shikumen buildings form a clear preference. In the embodiment of the city’s local context, Shikumen buildings have strong advantages, while for the same cement buildings and square buildings of the original “neighborhood factory”, people tend to choose the latter.
- 3) In the small-scale visual environment of streets, the influence of plants on the visual environment is more obvious. When the whole appearance of buildings cannot be shown, the volume, color and shape of the plants have a greater influence on the visual preference.
- 4) Designing creative and high-tech business types are more likely to be recognized by people’s visual perception.

5. Conclusion

This study mainly discusses the visual environment description and visual preference in the cultural and creative industries in Shanghai. The survey results show that the architectural continuity of the cultural and creative industries is positive related to people’s visual perception, and continuous architectural features are more easily described with clear symbols in subjects’ description on visual environment; the subjects do not have significant impact of visual perception on the spatial scale in the sample test, but the survey options indicate that they would be affected by crowded perception in the actual place; the complexity of the environmental elements is positively correlated with the visual environment preference when it starts to rise, but when it reaches a certain level, it shows a negative correlation trend; The business type in the cultural environment is

obviously correlated with the architectural form, and the visual environment with more complex architectural decoration has higher visual preference.

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