
Research on the Landscape Image of Urban Architecture Environment -A Case Study on Shenzhen

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Abstract

Rapid economic development has brought prosperity to cities, but it also caused some negative impact on cities, such as the lack of cultural characteristics in some cities. It is just because of the negligence of architectural landscape culture that caused this scarcity of cultural characteristics which are usually seen from the inner side of the city to the outside. Therefore, this study will start with culture, combine the feeling-values of the general public to explore the sensual intents of iconic elements in some emerging cities. In this study, eight iconic culture landscapes were selected as research samples through literature analysis and questionnaire surveys. In addition, a case study was conducted in Shenzhen which is an emerging city in China. 110 suitable sample adjective phrases were collected, after which 44 the most suitable adjective phrases were selected by 10 experienced designers and relevant professionals. Later on, the samples were screened through the Likert Scale by the degree of preference. Questionnaire results were analyzed in factor analysis by SPSS (statistical software), from which six groups of iconic element visual intent factors were obtained. They were then reintegrated and renamed. After a descriptive analysis of the renamed six groups of factors, a radar chart of the corresponding iconic elements was made to show the perception images of the general public. Hopefully, the results of this research can provide some references for relevant professionals and designers in planning cities environment, making city business cards, and promoting city's international reputation.

Keywords: architectural landscape image, semantic differences, factor analysis

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INTRODUCTION

Emerging cities refer to those rapidly developing cities that emerge with the rise of some industry or by the help of other unique advantages. From the perspective of urbanization in China, the number of such cities will gradually increase. And these cities are conditional to become new cities with modern features. Taking the future development strategies for such cities into account, the planning of cities and the creation of urban image will be the top priority (Megeri and Kengnal 2016). The research will be conducted based on a case study in Shenzhen, China.

Shenzhen, also known as Pengcheng, is a provincial city in Guangdong Province, China. It is located in the south of Guangdong Province, lied on east bank of the Pearl River Delta, adjacent to Dapeng Bay and Daya Bay in east, to Hong Kong Special Administrative Region of China in south, to Pearl River estuary in west, and to Huizhou and Dongguan in north (Shenzhen People's Government Press Office 2014). Shenzhen is the first special economic zone for reform and opening up. At

present, it has developed into an international metropolis with certain leverage, and is famous for its "Shenzhen speed". At the same time, Shenzhen also enjoys a reputation as a "city of design" and a "city of creation". On the other hand, Shenzhen is one of the most important border port cities in China and has the most entry and exit ports in China (Shenzhen People's Government 2010).

Rapid development has made the rise of Shenzhen. At the same time, it has had some negative effects on the city of Shenzhen, resulting in the lack of cultural features in the city itself and the lack of iconic elements from inside to outside. Therefore, this study will use the above-mentioned cultural issues as an entry point, then seek out and sort out the landscape of iconic cultural buildings that meet Shenzhen's urban characteristics. Meanwhile, its sensual images will also be explored and discussed. Hopefully, the results of this research can provide some references for relevant professionals and designers in planning cities, making city business cards, and promoting city's international reputation.

LITERATURE REVIEW

Discussion on Shenzhen Urban Culture Environment

In the 21st century, culture has become a factor that cannot be ignored in the development of modern cities. Urban culture environment also plays an important strategic role in the internationalization of cities (Jiang 2007). As the most important emerging city in China, to build a regionally international city is the primary development goal of Shenzhen in the next 20 years. To this end, we must correctly and fully understand the current urban culture environment of Shenzhen. (Wu 2004).

Due to historical reasons, the cultural blueprint of Shenzhen is extremely difficult to outline. It is conflicting but mutually inclusive, wandering between the center and the edge. At the same time, it also represents a cultural frontier of China's opening up era. Just ten years ago, neither did Shenzhen have any top university, nor it had any academic and cultural resources. But even so, we have felt the impact of emerging culture on Shenzhen at all times. Therefore, we would like to discuss Shenzhen's cultural species through the analysis of Shenzhen, starting with the following three aspects: openness and compatibility, innovation and efficiency, vitality and struggle (Jiang 2007, Wang 2007).

Sensual Intent

Through discussing and summarizing the literature, it is known that the so-called intention can be called an appearance or an image, and it is an expression of a virtual or unrealistic object. The information conveyed by the intention often has a clear and sensual color, but it is also considered to have a certain representativeness. Mckellar (1972) The following data were obtained from experimental results: 66% of people have olfactory intentions; 67% have taste intentions; 70% have tactile intentions; 74% have motor intentions; 93% have auditory senses; up to 97% of people have visual intent (Mckellar 1972; Peng 2000). From the above study, we can know that according to the different sensory channels and the nature of the stimulus, intention can be roughly divided into six categories: olfactory intention, taste intention, tactile intention, movement intention, auditory intention, and visual intention (Peng 2000).

However, relevant research also pointed out that the intention is usually obtained by the similarity among sketches of research objects and by imagining the form or shape of basic objects. Therefore, it is difficult to

accurately define the complexity of the object shape perceived by the measured object (Del Bimbo 1994). In daily life, vision is the main perceptual subject of human beings. Moreover, it is learned through research that visual intention accounts for the largest proportion. Thus, this study focuses on the visual intent of perception image.

In summary, this study hopes to investigate and analyze people's visual and psychological feelings and different iconic elements in Shenzhen through scientific and objective research methods. Finally, the research explored and discussed the general public's visual intent evaluation of Shenzhen's iconic elements. This study used the adjective phrases to compare the intentionality of each landmark element, and then used the factor analysis method to evaluate and analyze the intention of various landmark elements.

Semantic Differential Method

The semantic differential method is a measurement technique developed by Osgood et al. Its purpose is to test people's attitudes and feelings towards a certain assessment object. In the test of the semantic differential method, the subjects will complete a multiple choice test, comprising many sets of contradictory adjectives options, which are also layered. The space of these layers is the semantic space (Osgood 1975).

Among all the methods performed in this study, the Semantic Differential Method was at the core position. This method was used to compile the semantic differential table which aims to explore the city's intentional image perception of urban iconic elements. Finally, statistical tools were used to analyze and process the data to determine the reliability and validity of the research results.

Factor Analysis

Factor analysis is also called dimensionality reduction analysis. Its significance and role lie in the fact that multiple indicators which respond to the same content are classified into the same category with indicators that have very similar responses, while indicators that reflect different content are classified into other categories.

Some scholars also believe that factor analysis is "a statistical method to determine how many factors are needed to explain the correlation between a group of variables. And a factor is a combination of multiple related variables that can measure the same characteristics" (Brown 1983). Simply speaking, factor analysis can use fewer categories to restore the original



Fig. 1. Illustrative cultural elements

Table 1. The first 44 adjectives with the highest average points

good	enthusiastic	natural	craftsmanship	harmonious
fresh	bright	baronial/grandeur	gorgeous	gaudy
fashionable	popular	smooth	striking	exquisite
luxurious	durable	rhythmic	hierarchical	distinct
solid	solemn	gracious	modern	classical
innovative	stylish	traditional	confident	coordinated
changeable	structure	mass	stable	steady
chunky	rigid	simple	long-lasting	open
Sensual	regular	natural	technological	

data structure while maintaining the integrity of the original data, which is a data simplifying method (Lin et al. 2011).

RESEARCH AND ANALYSIS

Iconic Cultural Landscape Patterns

This research integrates those unique cultures in Shenzhen such as “traditional culture”, “economic special zone culture”, “creation culture” and “modern culture, then selects eight landmark architectural landscapes that can represent Shenzhen, respectively Shenzhen Library, Deng Xiaoping Portrait, 2013 Cultural Creation Park, Shenzhen Design Industrial Park, Dongmen Xihua Palace, Dapengsuo Fortress, Emperor Building, Luohu Port Building. Eight photos were selected in total (See **Fig. 1**).

Extraction of Collected Adjective Phrases

This study was conducted with references from relevant visual intent papers and research. Based on previous researches and summaries of visual intent, combined with the author’s own relevant design experience, 110 adjectives were selected to discuss and explore the visual intent that the public has toward certain iconic cultural elements. At this stage, the author invited 10 designers and relevant professionals to conduct the adjectives extraction and successfully completed the adjectives extraction questionnaire. Among the provided 110 words or phrases, 44 adjectives with more precise and accurate expression were picked out to depict the above 8 iconic cultural elements, as it shows in **Table 1**.

The above 44 adjectives will be made into the Likert scale and the five-segment scale will be used. The scales are: 1 = not at all, 2 = somewhat inconsistent, 3 = indefinite, 4 = somewhat consistent, 5 = Completely

Table 2. KMO and Bartlett test

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.634
Bartlett's Test of Approx. Chi-Square	2722.278
Sphericity df	946
Sig.	.000

Table 3. Total variance explanation

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.919	45.27	45.27	19.919	45.27	45.27	5.966	13.559	13.559
2	3.044	6.918	52.188	3.044	6.918	52.188	5.653	12.849	26.407
3	2.339	5.315	57.503	2.339	5.315	57.503	4.818	10.951	37.358
4	2.18	4.954	62.458	2.18	4.954	62.458	4.081	9.275	46.633
5	1.72	3.908	66.366	1.72	3.908	66.366	3.616	8.219	54.852
6	1.355	3.08	69.446	1.355	3.08	69.446	2.684	6.101	60.953
7	1.271	2.888	72.333	1.271	2.888	72.333	2.659	6.043	66.997
8	1.233	2.803	75.136	1.233	2.803	75.136	2.445	5.558	72.555
9	1.066	2.422	77.558	1.066	2.422	77.558	2.202	5.004	77.558
10	0.969	2.202	79.76						
11	0.861	1.957	81.718						
12	0.731	1.661	83.379						
...						
44	0.003	0.006	100						

suitable, based on which to investigate the degree of congruence between the adjective phrases and the iconic cultural elements.

Factor Analysis

A total of 65 copies of the Likert Scale Questionnaire (Shenzhen's iconic cultural elements questionnaire) were collected, including 61 valid questionnaires and 4 invalid. Questionnaire survey results were analyzed by SPSS (version 2017). It can be known from the analysis results that the Kaiser-Meyer-Olkin metric is 0.634, while in Bartlett's test the approximate Chi-squared allocation value is 2722.287; the df (degree of freedom) is 946; Sig. (Significance) value is 0.000. When the Kaiser-Meyer-Olkin metric is over 0.6 with significance value less than 0.050 in Bartlett's test, it not only means that there are common factors among the correlation matrices, but also that the analytical data just meets the test criteria (See **Table 2**).

In the extraction of the common factor variance, the absolute value of the factor loading of the 44 adjective indicators selected by the experts was greater than 0.6. When the loss of indicator extraction is less than 40%, the degree of information extraction reaches the standard. In this study, the various total variance shows

that the number of factors whose feature quality is greater than 1 is 9, while the 9 factor's cumulative contribution rate reached 77% (See **Table 3**). It is universally acknowledged that in the social science research, the standard is reached when the cumulative contribution rate of the factor is greater than or equal to 70%.

By analyzing the rotated component matrix based on factor analysis, it can be very clear that 44 descriptive terms were classified into 9 components after dimension reduction where components did not cover each other. Therefore, in the second phase of the research analysis, the nine factors will be reorganized as the facets to continue the research.

Factor Rename

The 44 descriptive terms processed by dimension reduction were divided into 9 components, a total of 19 descriptive terms. However, there are large differences or strong correlations among the factors, which will affect subsequent research. Therefore, at this phase based on the rotation component matrix, factor components were reorganized into six factors, which were used as the second-phase questionnaires for the subsequent visual evaluation of the landscape patterns

Table 4. Factor Renaming Table

Factors	Factor naming	Language group
Factors1	Regularly traditional	Regular; Natural; Traditional; Solemn
Factors2	Fashionably technological	Distinct; Stylish; Technological
Factors3	Technically coordinated	Technical; Coordinated
Factors4	Stylishly popular	Fancy; Fashionable; Popular; Natural
Factors5	Strikingly straightforward	Straightforward; Striking
Factors6	Warmly harmonious	Warm; Harmonious; Rhythmic

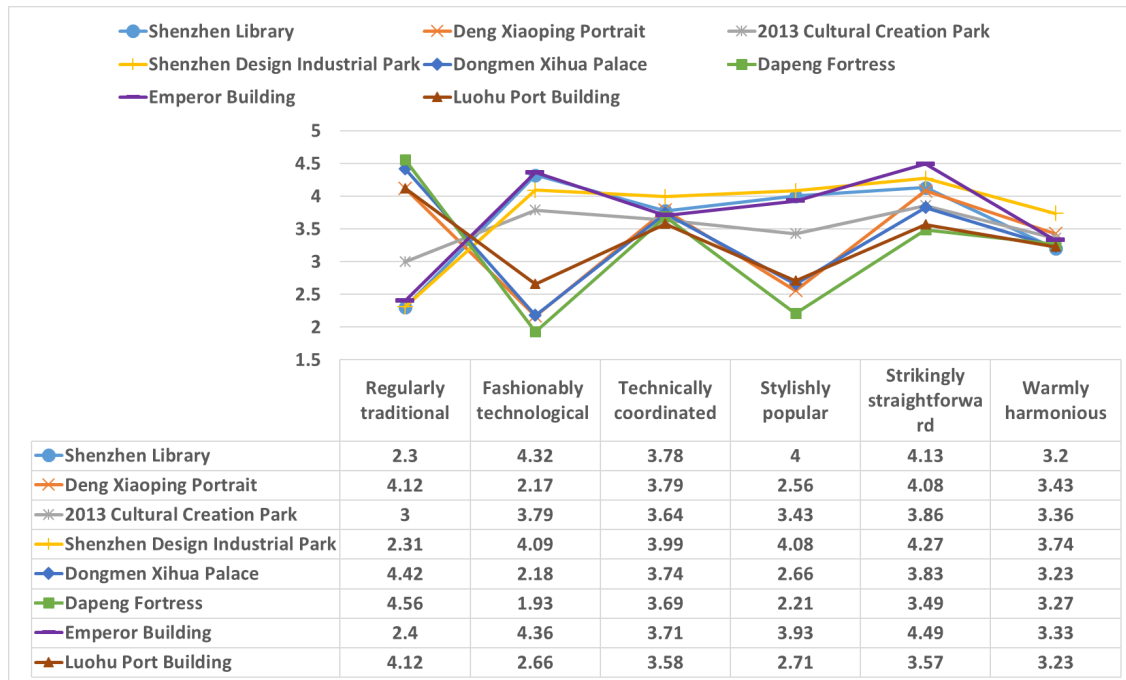


Fig. 2. Numerical line chart of landmark architectural landscapes

of eight iconic cultural buildings in Shenzhen (Table 4).

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

At this phase, a Likert Scale was remade for descriptive statistics. The questionnaire was divided into 8 parts corresponding to 8 landmark elements, whose options were on a five-segment scale. By SPSS (statistical software), data was collected and processed, after which the average value of visual cognition of eight landmark elements among the six factors was obtained. A total of 96 questionnaires were recovered, of which 90 were valid. The results are shown in Fig. 2.

Discussion

It can be seen from the line chart that the general public’s visual intents towards Shenzhen Library are Fashionably technological, Stylishly popular and Strikingly straightforward, with average values reaching 4.32, 4.00, and 4.13 respectively. Meanwhile, the average value of regularly traditional is only 2.30;

technically coordinated as well as warmly harmonious is between 4.00 and 3.00.

Contrary to the Shenzhen Library, the visual intent average value of Deng Xiaoping Portrait on the two factors of fashionably technological and strikingly straightforward are less than 3.00, respectively 2.17 and 2.56, while the average value of regularly tradition is the most prominent, reaching 4.12. The value of Strikingly straightforward also exceeds 4.00, reaching 4.08. Thus, we can conclude that the general public’s visual cognitive intent toward Deng Xiaoping Portrait is Regularly traditional and Strikingly straightforward.

As for 2013 Cultural Creation Park, the third iconic element, toward which people’s visual cognitive intent is quite dissimilar with the two elements above. Through the analysis of the line chart, we can see that the average value of the six factors in the 2013 Cultural Creation Park is between 3.00 and 4.00. The two most prominent factors are Fashionably technological and Strikingly straightforward, whose value is 3.79 and 3.86, respectively. The lowest factor is Regularly traditional, with an average of 3.00.

Shenzhen Design Industrial Park's visual intent has three factors that exceed the average of 4.00, respectively, Fashionably technological, with an average of 4.09; Strikingly straightforward, 4.27. For Warmly harmonious and Technical coordinated, their average values are very close to 4.00, respectively, 3.74 and 3.99. Regularly traditional has the lowest average value, of 2.31.

The visual intent line chart of Dongmen Xihua Palace is somewhat similar to that of Deng Xiaoping Portrait. The average value of Regular traditional reaches 4.42. In addition, there are three factors whose average value is between 3.00 and 4.00: respectively, Technical coordinated, 3.74; Strikingly straightforward, 3.83; and Warmly harmonious, 3.23. The average value of the other two is between 2.00 and 3.00, 2.18 for Fashionably technological and 2.66 for stylish popular.

The line chart of Dapeng Fortress is similar to the line chart of Dongmen Xihua Palace and Deng Xiaoping Portrait. However, compared to the line chart of Dongmen Xihua Palace, it can be found that the highest and lowest factors of Dapeng Fortress are the same as the rule tradition. And fashion technology. The difference is that the highest factor of the Dapeng Fortress is even higher, reaching 4.56. The lowest factor mean is even lower, only 1.93.

There are two visual intent factors of Shenzhen Emperor Building whose average values are higher than 4.00: Fashionably technological, 4.36; Strikingly straightforward, 4.49. The factors with an average value higher than 3.00 were Warmly harmonious, Stylishly popular and Technical coordinated. Their values are 3.33, 3.93, 3.71, respectively.

The Luohu Port Building has only one factor whose average value is above 4.00, i.e. the regularly traditional, reaching 4.12. Of the remaining five factors, there are three factors whose average value are above 3.00: respectively, Technical coordinated, reaching 3.58;

Strikingly straightforward, reaching 3.57; Warmly harmonious, reaching 3.23. Factors whose average values are below 3.00 are Fashionably technological and Stylish popular. Their values are 2.66 and 2.71.

CONCLUSION

This study explores and studies the iconic cultural landscape of Shenzhen from the perspective of the general public. After reading and analyzing the literature and after discussions with relevant professionals and scholars, it was determined that eight iconic cultural landscapes were selected as samples for research. The samples were also sufficiently representative.

In the selection of adjective lexicon for visual intent evaluation, 44 in 110 adjective phrases were selected by relevant experts. Then SPSS factor analysis statistical method was used to effectively reduce the number of adjective phrases, after which those adjectives were renamed. Finally, 6 linguistic factors were obtained. As for the descriptive statistics of SPSS, it is to obtain the average value of the people's visual intent cognition of iconic elements, so that the results can be more scientifically compared and analyzed. The results of the study will help to narrow the gap between designers, decision makers, and the public on the sensual perception of Shenzhen's iconic cultural landscape. At the same time, it is also expected to enhance Shenzhen's international influence from the side.

With regard to the results of this study, they could provide designers with intent numbers that were obtained through scientific analysis, allowing designers to have a theoretical basis for design when cultural and creative industries in Shenzhen were engaged in designing cultural and creative products for the above-mentioned iconic cultural landscapes. On the other hand, this study can also be referenced, when Shenzhen builds city business card and enhances the visibility of itself in the international arena.

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