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A Study on the Landscape Imagery of Harbin Historic Block Based on Cognitive-Affective Theory

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SUMMARY: *Landscape image refers to the integrated manifestation of public cognition and affect formed through the memory and imagination of landscape spaces. Existing research has primarily emphasized the material dimension of urban spaces, while giving insufficient attention to their emotional dimension and lacking a thorough examination of the internal mechanism by which landscape images are constructed. Drawing on the cognition–emotion theoretical framework, this study develops a multidimensional construct of landscape image. By combining questionnaire surveys with cognitive mapping, we reveal the characteristics and spatial distribution patterns of landscape images in Harbin's historic districts, and further identify the hierarchical mechanism through which cognition and emotion jointly shape landscape image formation. The results show that landscape images in Harbin's historic districts are characterized by: a strong presence of folk culture, distinctive architectural forms, high commercial vitality, relatively open boundaries, strong emotional attachment, and a high level of place identity. Spatially, landscape images exhibit a "dense-west and sparse-east" pattern, with clusters concentrated in Nan'er and Nansan subdistricts. Cognitive image exerts a stronger influence on overall landscape image than emotional image; stronger cognitive perceptions enhance emotional responses, and emotional image functions as the key mediator through which cognitive image is transformed into landscape image.*

KEYWORDS: *road landscape; historic districts; cognition–emotion*

1 Introduction

Historical districts, as carriers of urban memory, carry rich historical information and are important identifiers of a city's cultural characteristics and spiritual core [1]. As a representative city in Northeast China, Harbin's historical districts serve as vivid display Windows for the integration and mutual learning of architectural art, folk customs and lifestyles between China and the West.

Landscape imagery refers to the comprehensive manifestation of the public's cognition and emotions towards the landscape environment of a block formed through the subject's memory and imagination [2, 3], reflecting the public's genuine demands for the development and construction of the block landscape [4], and it is also a key force in shaping the uniqueness of a city's appearance.

The characteristics of the block environment in the post-industrial era have shifted from the

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original production-oriented to scene-driven, leading to a shift in the focus of landscape image research from the physical spatial form to the public's subjective feelings mainly based on "historical context, social culture, and community psychology" [5]. The "cognitive- emotion" theory is mainly used as the theoretical basis for such research [6, 7].

The "cognitive-emotion" theory was proposed by Baloglu and McAleary, indicating that the formation of imagery is a dynamic process and dividing landscape imagery into two levels: cognitive imagery and emotional imagery. At the cognitive image level, research is conducted based on the identifiability proposed by the "urban image" theory [8]. The identifiability of elements such as architectural style and color, public facilities, plants, and pavement are all important ways to enhance the image [9]. The paradigm shift in the field of spatial cognition research reveals the methodological evolution of urban image theory. From the perspective of spatial discernment, scholars have reconstructed the analytical framework of spatial structural imagery through the spiritual translation of material elements. Researchers have found that the continuity design of road directionality, as a core clue for spatial identification, directly affects the efficiency of path cognition [10]; Shi Yan interprets the cognitive situation of campus spatial relationships through spatial boundaries [11]; Indicators such as interface enclosure and pleasant scale essentially transform spatial form parameters into perceivable image features [12, 13]. Some scholars have also paid attention to the readability of the cultural connotation of the landscape. Zhou Yan, through his research on commercial streets in Xi 'an, found that landscape elements with regional cultural characteristics are more easily recognized by the public [14]. Zhu Junde found that holding festival activities and creating readable cultural landscapes can easily stimulate public participation, thereby promoting the formation of imagery [15], which makes up for the deficiency that most existing research at the cognitive imagery level is limited to the analysis of the appearance of landscape composition.

In the research of emotional imagery, the focus is on the deep psychological connection in the interaction between people and the environment. Scholars use concepts such as "sense of place" and "place spirit" to interpret people's special emotions towards the environment [16, 17], stimulating emotional responses centered on place attachment. Specifically, a good neighborhood environment can have a positive impact on residents' psychology and evoke place attachment at the emotional level. It helps promote interpersonal communication at the social level. These psychological mechanisms jointly enhance residents' sense of identity and belonging to the neighborhood, etc. [18] Zhang Hui et al. indicated that a sense of dependence and familiarity is an important factor in enhancing the evaluation of landscape imagery [19]. WesterHerber found that environmental recognizability strengthens neighborhood identity and enhances a sense of belonging and local attachment through elements such as architectural style and plant configuration [20].

Patri.cios et al. hold that a landscape cannot be defined merely by its constituent factors; the constituent factors are just clues that assist in presenting the overall image of the landscape. The landscape is the overall image of psychological structure and emotion [21]. Therefore, the research on landscape image based on the "cognition-emotion" theory can be constructed from the dual dimensions of cognitive image and emotional image. For instance, Tang Wenyue et al. analyzed the differences in the public's sense of place towards Jiuzhaigou from the dimensions of nature, culture, function and emotion [22], and Wang Peihong et al. constructed a theoretical model of the influence of hometown sentiment on the assessment of landscape image [23].

Some scholars have conducted research on the influencing factors of emotional imagery [24], and tree diversity and flower landscapes have been confirmed as key carriers for enhancing emotional connections [25]. Dong Yu's empirical research reveals that road damage can increase psychological discomfort, and a good neighborhood environment can enhance

public familiarity [26]; The continuity of architectural interfaces can enhance the visual aesthetic appeal and increase public trust and a sense of belonging [27].

In terms of research methods, although traditional qualitative research methods can reveal the rich connotations of landscape images, when it comes to the current local sentiment research of blocks, there still exists the problem that sentiment assessment is difficult to connect with the decision-making for improving and optimizing the local environment [28]. This paper constructs a multi-dimensional evaluation path and, in combination with weight distribution, realizes an evaluation model that explores landscape images in combination with emotions. Not only can it more accurately identify the key factors influencing landscape imagery, but it can also explore the internal mechanism of landscape imagery formation.

Based on the exploration of the public's perception and emotional experience of the landscape environment of the traditional commercial and historical blocks in Daowai District, Harbin, this study combines quantitative and qualitative analysis to extract the spatial image of the block landscape, analyzes the characteristics and decline of the landscape image of Harbin's historical blocks, and examines the internal causes. On the one hand, it can provide empirical support for the problem of landscape amnesia in small-scale blocks and address the improvement practices of urban amnesia caused by homogenization. At the same time, in terms of methods, it focuses on the individual cognition and emotional experience of environmental experiencers. Under the background of humanism, it further explores the analysis of the mutual mapping between the landscape image and the subject of urban memory - that is, the subjective consciousness, value orientation and other spiritual phenomena and physical space of "people".

2 Study Area

The Daowai Historical District is one of the top ten historical and cultural protection districts in Harbin, covering a total area of 47.23 hectares. It is connected to Jingyang Street, Shidao Street, Nanxun Street and Shengping Street in the east, west, south and north respectively, totaling 16 streets.

This district has the longest history and culture in the modern development of Harbin. It preserves traditional customs and cultures such as storytelling, opera and crosstalk, and hosts folk activities and exhibitions. The neighborhood is also the birthplace of Harbin's national industry and commerce, with many century-old time-honored brands, such as Laodingfeng, Zhangbaopu, Jingyu Pawnshop and other stores. Meanwhile, the Daowai Historical District, influenced by the Russian culture during the construction of the Chinese Eastern Railway, has a relatively complete road structure system and architectural remains with distinct Baroque style. The courtyard style adopts the "front store, back factory" or "upper residence, lower store" model, reflecting the traditional commercial and residential integrated business format. It is currently a key historical and cultural protection district that has attracted much attention in **Figure 1**.

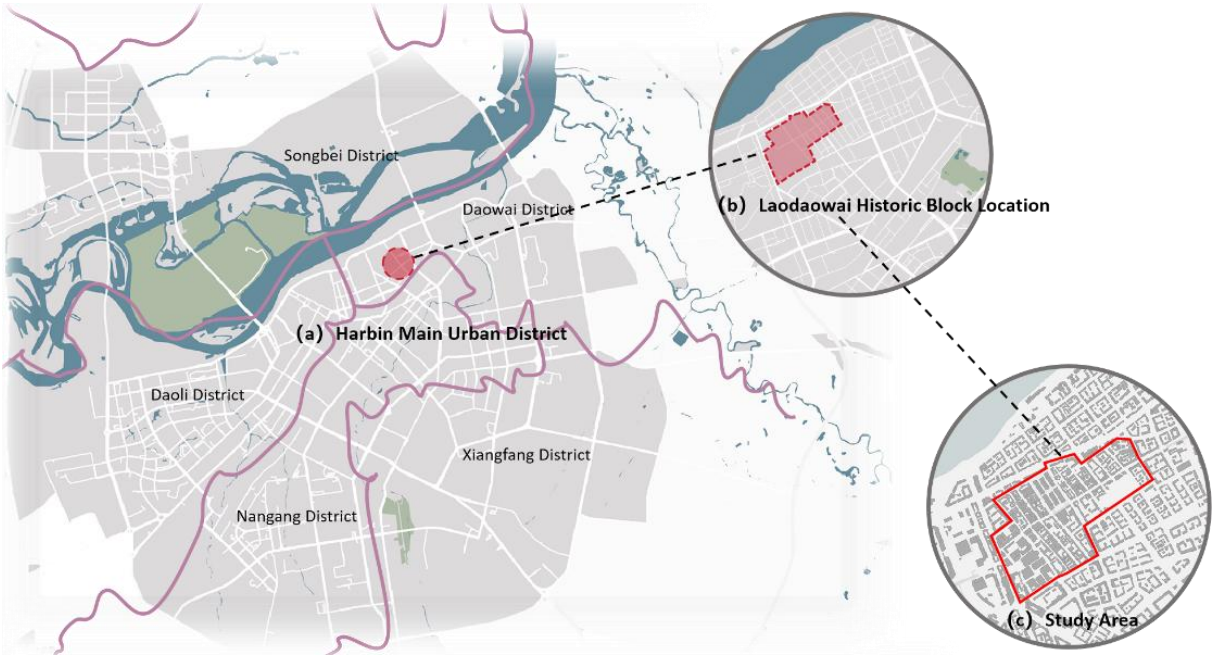

Figure 1: Study Area (Base map sourced from Geospatial Data Cloud: https://www.gscloud.cn/)

3 Research Methods

This study, based on first-hand data from cognitive maps and questionnaires regarding the experience of landscape imagery in historical districts, conducts a comprehensive investigation into the respondents' cognitive and emotional experiences of the landscape environment through spatial analysis and quantitative analysis methods in **Figure 2**.

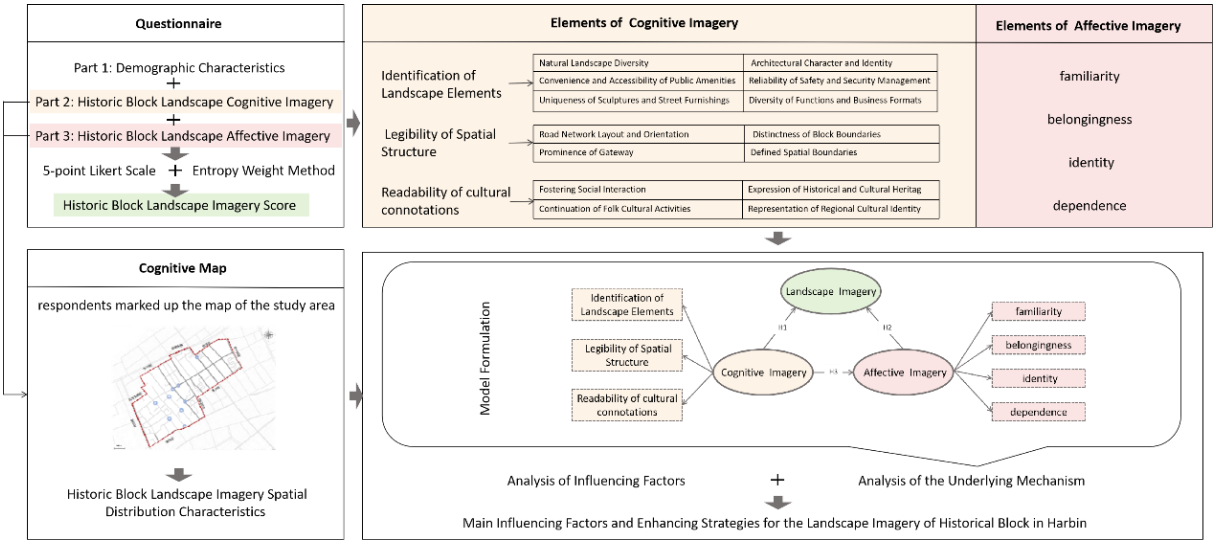

Figure 2: Technical Framework

3.1 Data Collection

The time span of this study is from June 2024 to August 2024. Data collection was conducted by distributing questionnaires on-site. A 5-point Likert scale was set up to select and evaluate

the landscape image indicators of the block from five options: very satisfied, satisfied, average, dissatisfied, and very dissatisfied. A total of 306 questionnaires were collected. After deleting the invalid questionnaires, 258 questionnaires were obtained, and the effective recovery rate of the questionnaires was 84.3%. The free drawing method in the cognitive mapping approach was adopted to collect data on the image space. Respondents were required to draw the floor plan of the block landscape image in combination with the questions in the questionnaire. A total of 72 valid cognitive maps were obtained.

3.2 Construction of the Landscape Image Dimension System

Based on the composition perspective of the block landscape image and taking the cognitive-affective theory as the theoretical framework foundation, this study constructs the landscape image index system from the two dimensions of cognitive image and emotional image.

The cognitive image dimension is composed of three sub-dimensions: the recognizability of landscape elements, the recognizability of spatial structure, and the readability of cultural connotations, with a total of 14 measurement indicators. The recognisability of landscape elements includes six elements: the diversity of natural landscapes, the distinctiveness of architectural styles, the convenience of public facilities, the reliability of safety management, the uniqueness of sculptures and small works, and the richness of functional business forms. The identifiability of spatial structure includes four elements: the directionality of road layout, the clarity of block boundaries, the prominence of entrance Spaces, and the enclosure of spatial interfaces. The readability of cultural connotations encompasses four elements: the interaction of social life, the expression of historical culture, the continuation of folk activities, and the embodiment of regional culture.

The emotional image dimension includes four types of emotional response characteristics: familiarity, sense of belonging, sense of identity and sense of dependence (Figure 2).

3.3 Data Analysis

First, determine the weights of each dimension of the landscape image. The entropy weight method is adopted to determine the final weight of the landscape image evaluation index of historical blocks, avoiding the arbitrary influence of the subjective weighting method and improving the rationality of determining the weight of the landscape image evaluation index of historical blocks in Harbin [29]. The calculation formula is as follows:

$$w_j = \frac{d_j}{\sum_{j-1}^{m} d_j}$$

w_j: The weight of the JTH indicator; m: Total number of indicators; $\sum wj = 1$; dj: Coefficient of variation

Secondly, the comprehensive evaluation value of landscape images is obtained through the weighted summation model, providing a quantitative basis for multi-dimensional landscape image evaluation. The calculation formula is as follows:

$$S_j = \sum_{j-1}^{m} w_j \cdot x'_{ij}$$

S_i:The overall score of the landscape image of the i-th sample.

Finally, the landscape image elements of historical districts extracted from the collected cognitive maps are visualized through the GIS platform. The positions and quantities of the 18 landscape image elements in the cognitive maps are included in the GIS dataset in the form of point data. The kernel density spatial analysis visualization can express the public's overall and classified images of the historical district landscape.

4 Results

The gender ratio of the tested subjects was basically the same, accounting for 48.37% and 51.63% respectively. The largest number of people are aged between 18 and 45, accounting for 72.51%, among which those aged 25 to 35 make up a relatively large proportion, showing a more obvious trend of younger age.

The reliability and validity of the data were tested through SPSS27.0. The reliability Cronbach's coefficient was greater than 0.8, and the validity detection KMO and Bartlett's Test of Sphericity were greater than 0.8 (**Table 1**). The data demonstrates high reliability, can provide effective support for analysis, and the data recovery is effective. In the Chi-square test analysis of their social background factors and preference expressions, it was found that there were no significant differences among different age groups, genders, and the number of visits. It indicates that the block landscape has strong inclusiveness and can provide a relatively fair usage environment for different groups.

Table 1: Reliability and Validity of the Questionnaire

Cronbach’s Alpha		.876
Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy		.876
Bartlett’s Test of Sphericity	Approx. Chi-square	8134.069
	df	153
	Significance	000***

The GIS kernel density analysis of the image elements extracted from 72 cognitive maps can present the overall and subcategory distribution of the landscape image space in historical blocks, reflecting the spatial distribution characteristics of the block landscape image. Based on 258 questionnaires, this paper analyzes the deep image characteristics of each space in the dimensions of landscape cognitive image and emotional image, and interprets the continuation context of urban memory contained in the landscape of historical districts and the possible reasons for the decline of images.

4.1 Overall Characteristics of the Landscape Image

The landscape image features of the traditional commercial and historical district in Daowai, Harbin, are characterized by a rich folk culture, prominent architectural landscapes, strong commercial vitality, relatively open boundaries, and a high sense of identity. This block demonstrates outstanding advantages in the inheritance of intangible culture, with excellent performance in the continuity of folk activities and the reflection of regional culture (**Table 2**). The richness of functional formats and the convenience of public facilities jointly ensure the practical efficiency of the block. Emotional identity indicators such as recognition and belonging interact positively with the material and immaterial elements of the neighborhood. The numerical differences in the directionality of road layout, the enclosure of spatial interfaces and the clarity of boundaries reflect the unique "blurred boundaries" spatial feature of

traditional commercial and market blocks. This semi-open spatial structure provides a material basis for the continuous supply of commercial vitality.

The spatial distribution of the landscape imagery elements of the historical district is more prominent at the intersection of Jingyu Street and North Fifth Street, extending southwestward (**Figure 3**). The main reason is that this area is located in the core protected zone of the district, and the buildings, facilities, business types, and culture in the Chinese Baroque style street are relatively concentrated, with a high degree of imagery.

Table 2: Evaluation Results of the Landscape Image

	Dimension	Weight	Score	Sub-dimension	Weight	Score	Indicator	Weight	Score
Landscape Image	Cognitive Image	0.503	3.883	Identifiability of Landscape Elements	0.361	3.818	Natural landscape diversity	0.154	3.93
							Architectural style distinctiveness	0.178	3.93
							Convenience of public facilities	0.164	3.83
							Reliability of safety management	0.169	3.86
							Uniqueness of sculptures and installations	0.167	3.45
							Diversity of functional business forms	0.167	3.92
				Legibility of Spatial Structure	0.338	3.852	Directionality of street patterns	0.244	3.91
							Clarity of block boundaries	0.254	3.73
							Prominence of entrance spaces	0.289	3.88
							Enclosure of spatial interfaces	0.212	3.90
				Readability of Cultural Connotations	0.301	3.996	Social interaction vitality	0.217	3.78
							Expression of historical culture	0.267	3.92
							Continuity of folk activities	0.213	4.12
							Representation of local culture	0.303	4.13
	Emotional Image	0.497	3.84	Sense of identity	0.314	3.96			
				Sense of familiarity	0.204	3.71			
				Sense of belonging	0.266	3.86			
				Sense of dependence	0.216	3.76			

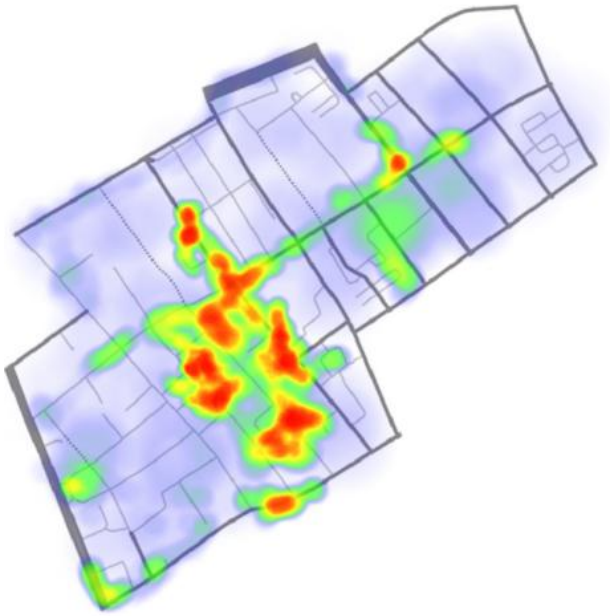

Figure 3: Overall Landscape Image

4.2 Characteristics of the Cognitive Landscape Image

Based on the quantitative analysis of the cognitive imagery of the Harbin block landscape, the research found that the cognitive imagery of the block landscape shows diversified development characteristics (**Table 2**). The readability of cultural connotations is prominent, and the cognitive dimensions of various landscapes develop in a coordinated manner, demonstrating a perfect combination of commercial functions and cultural connotations.

In terms of the recognicity of landscape elements, the diversity of natural landscapes and the distinctiveness of architectural styles constitute the dominant factors. The two work together to form a distinct visual logo system. However, the relatively weak uniqueness of sculptures and small works indicates that there is still room for improvement in the design of artificial landscape elements. The dimension of spatial structure identification shows a balanced development trend. Among them, the directionality of the road pattern and the enclosure of the spatial interface ensure the guiding efficiency, while the moderate ambiguity of the clarity of the block boundary appropriately retains the infiltration characteristics of the traditional commercial market. The most distinctive aspect is the dimension of cultural connotation readability, which mainly stems from the dual support of the continuation of folk activities and the manifestation of regional culture, and together with the presentation of historical culture, it jointly constructs a complete cultural cognition of the block.

The spatial distribution of cognitive imagery in the block is influenced by the recognisability of landscape elements and spatial recognisability. This is more prominently concentrated at the intersections of Nan Er Street, Nan SAN Street, and Diling Street and Jingyu Street (**Figure 4**). Meanwhile, the Nan Er Street and Nan SAN Street areas, due to the combination of rich functional business types and diverse folk activities, The overall degree of imagery has been enhanced, and moderate spatial limitation is conducive to the formation of cognitive imagery.

4.3 Characteristics of the Emotional Landscape Image

The emotional image characteristics of the traditional commercial and historical districts in Daowai District, Harbin, show a relatively high degree of recognition through four core

indicators (**Table 2**). Among all dimensions, the emotional experience is balanced, with the highest score for identity, indicating that the public has a relatively high emotional identification with the overall environment and cultural atmosphere of the neighborhood. The evaluations of a sense of belonging and dependence are also relatively positive, with scores close to each other. However, the score for familiarity is relatively low. The reason is that the landscape of this neighborhood has undergone multiple maintenance and renovations, resulting in a low level of public familiarity with it.

The spatial distribution of emotional imagery is concentrated on South Second Street, extending to the east and west sides of South First Street, South Third Street and North Third Street, which is a characteristic of Chinese Baroque. The Erbin Story, Daowai Baroque Museum, Xu Shichang Museum, and the former site of Songguang Cinema, among other places, evoke excellent emotional experiences (**Figure 4**). Among them, the spatial distribution of familiarity and a sense of belonging is more concentrated in emotional retention. Wenzhou International Trade City, Laodingfeng, Harbin Beer Culture Square, Daowai Antique Market, museums, etc. mostly retain their old appearance. Landscapes with a lower degree of renovation are more likely to trigger these two types of emotional experiences

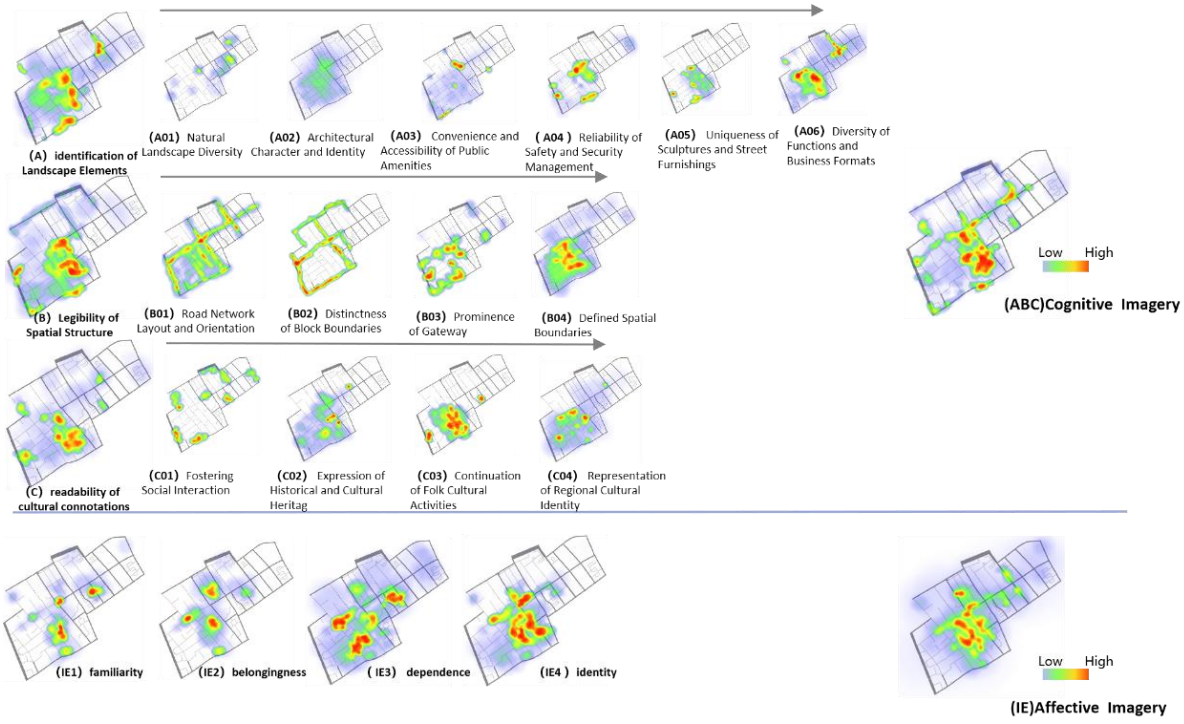

Figure 4: Spatial Heat Maps of Cognitive and Emotional Landscape Images

5 Internal Mechanisms of Landscape Image Formation

From the perspective of the formation mechanism and process of landscape imagery, on the one hand, cognitive imagery and emotional imagery have an explicit influence on the formation of landscape imagery in historical districts. On the other hand, under the dynamic construction of urban development and social culture, the public actively or passively changes their lifestyles and subjective consciousness, leading to changes in the emotional imagery of the landscape in historical districts. This further exerts an invisible influence on the process of landscape imagery in cognitive imagery. The perception and emotional experience of the landscape

environment in the traditional commercial and historical districts outside Daowai can also reflect the influencing factors of the formation of corresponding images under the background of homogenization of the landscape of historical districts in Harbin from the perspective of specific cases.

5.1 Analysis of Influencing Factors of Landscape Image

This section conducts a correlation analysis between emotional imagery and cognitive imagery. After Pearson correlation testing, multiple regression analysis is carried out to screen out the important factors influencing each dimension of emotional imagery, and to clarify the specific landscape elements that affect landscape imagery under the expression path of emotional imagery.

Identify the core driving factors of each dimension of emotional imagery in landscape imagery through multiple regression: Familiarity depends on the convenience of public facilities and the directionality of roads, emphasizing the clarity of spatial functions; The sense of belonging is dominated by the distinctiveness of architectural style and social interaction, reflecting the dual roles of architectural aesthetics and cultural participation. Identity is the key to the continuation of folk activities and the manifestation of regional culture, highlighting the recognition value of cultural symbols. Relying on the perception of historical and cultural expressions and the clarity of spatial boundaries, it reflects the stability of culture and structure (**Figure 5**).

Some cognitive elements have cross-level influences on multi-dimensional emotional images: The continuation of folk activities is significant in terms of familiarity, belonging and identity, indicating that cultural activities are the core medium for connecting multi-dimensional emotions. The directionality of road layout simultaneously supports a sense of familiarity and dependence, indicating that spatial logic and guidance have both basic cognitive and long-term emotional maintenance functions. The positive influence and role differentiation of architectural style distinctiveness in belonging and identity reflect the primary and secondary differences as emotional carriers. The role of natural landscape diversity in enhancing familiarity and identity confirms the evolution path of ecological elements from basic cognition to cultural identity.

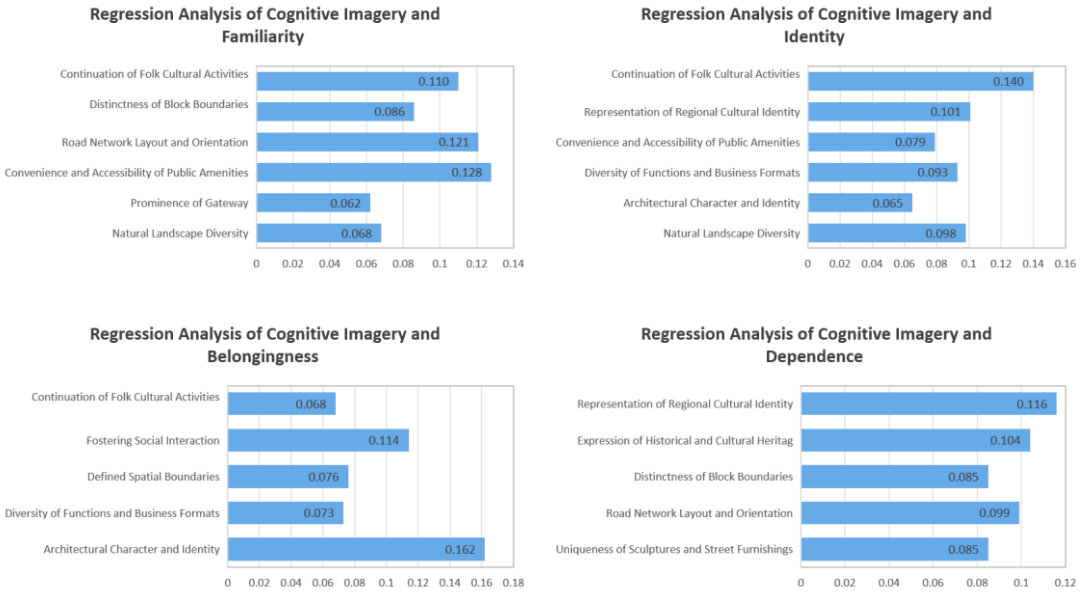

Figure 5: Analysis of Factors Influencing the Landscape Image

5.2 Internal Mechanism of Landscape Image Formation

After orthogonal rotation (Varimax rotation) through Factor analysis, four landscape image factor classifications (KMO=0.853) were obtained, which explained a total of 61.258% of the differences. It is proved that the dimension division of the questionnaire is reasonable and can truly reflect the classification of landscape image factors in historical districts. The data were substituted into the partial least squares structural equation model (PLS-SEM) for detection (**Figure 6**). PLS-SEM integrates factor analysis and path analysis, which is conducive to simultaneously analyzing the independent and dependent structural relationships among cognitive images, emotional images and landscape images, and clarifying the role of individual indicators on the overall population and their interrelationships [30-33]. It is beneficial when the measurement scale and residual distribution are appropriate. Verify the problem of the actual role of emotional imagery in the chain of cognitive imagery -> landscape imagery to avoid the uncertainty of the final result.

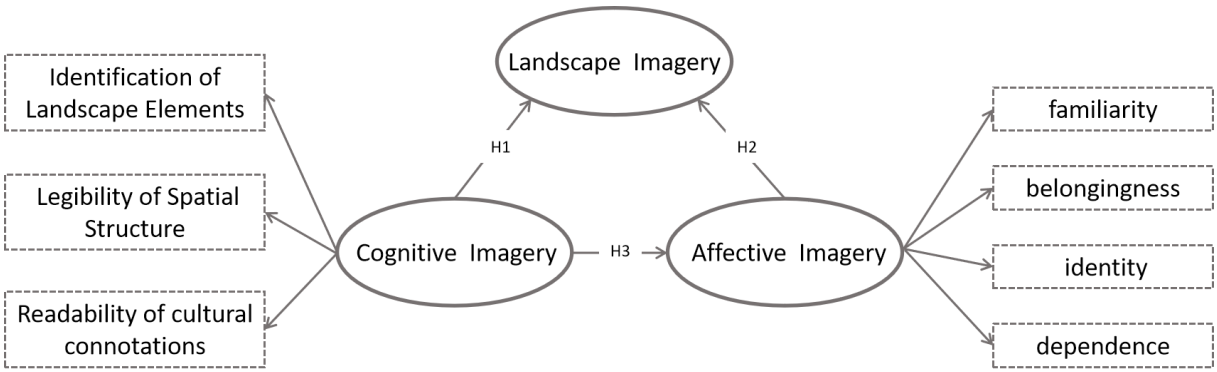

Figure 6: Structural Equation Model (SEM) Framework

(1) Reliability and validity analysis of model data

The reliability and validity of data are important indicators for testing the reliability of questionnaire data and the internal consistency of questionnaire data. Reliability is the evaluation of the stability and consistency of the results after analyzing the questionnaire of the measured scale. Validity refers to the degree of consistency between the inner prediction and the actual measurement data results. The higher the validity, the more the measurement results can reflect the true measurement situation [34]. After verification, it was concluded that the Combined reliability (CR) of the model =0.8, Cronbach's Alpha = 0.7, and AVE=0.61. The test results indicate that the reliability of the measurement model is good.

(2) Model checking

To ensure that the actual model matches the obtained data, this paper conducts model verification by observing whether the model fit index meets the standards. By using the SmartPLS3 software, common fitting indices were selected to test the fit between the initial model and the data. If the fit met the standard, it meant that the model and the data were completely compatible; otherwise, the model should be modified or trimmed [35]. After verification, the fitting indicators of the preset model, SRMR=0.079 and NFI=0.85, both meet the standards of SEM models, proving that the model has a good degree of adaptation and can be used for analysis.

5.2.1 Testing of Direct Effects

The results of the path analysis show that, as shown in **Table 3**, all the significance T values that directly affect the paths are >1.96, and the P values are <0.05. The paths pass the

significance test. It can be known from Model **Figure 3** that cognitive image significantly positively affects landscape image (0.452, P=0.000), emotional image significantly positively affects landscape image (0.663, P=0.000), and cognitive image significantly positively affects emotional image (0.372, P=0.000).

5.2.2 Testing of the Mediating Effect of Emotional Image

The mediating effect of cognitive images is calculated based on the formula $F=\frac{\sum_{i=1}^{n}|Q\times B|}{C+\sum_{i=1}^{n}|Q\times B|}$ (where F represents the indirect effect, C represents the direct influence of cognitive images on landscape images, Q represents the path load of cognitive images on emotional images, and B represents the path load from emotional images to landscape images). **Table 3** shows that emotional image plays an important mediating role in the chain of cognitive image -> landscape image (F<70%). Emotional imagery can play a positive promoting role in the formation of cognitive imagery and landscape imagery, with an intensity of 0.247 and P=0.000. In the formation process of landscape imagery, a dynamic interaction mechanism of "cognition driving emotion and emotion feeding back to cognition" is reflected.

Table 3: Path Results of the Structural Equation Model

Path	Path Coefficient (β)	Sample Mean (M)	Standard Deviation (STDEV)	T-value (|O/STDEV|)	p-value
Cognitive Image → Landscape Image	0.452	0.452	0.021	21.184	0.000
Emotional Image → Landscape Image	0.663	0.663	0.019	34.581	0.000
Cognitive Image → Emotional Image	0.372	0.372	0.040	9.196	0.000
Cognitive Image → Emotional Image	0.247	0.246	0.025	9.688	0.000

6 Conclusions and Implications

This paper selects the historical block of Daowai Traditional Commercial Market in Harbin as the research object. Based on the cognitive-affective theory and combined with the landscape characteristics of the block itself, a dimension system of landscape image for historical blocks is constructed. Meanwhile, the combined method of cognitive maps and questionnaire surveys was used to study the characteristics of the landscape image of the block, providing empirical evidence for analyzing the combined effect of multi-dimensional cognition and emotional expression on the landscape image. Secondly, the research results can effectively identify the shortcomings and strengths in terms of the landscape elements, spatial structure, cultural connotation and emotional experience of the block. This enables landscape design practitioners to precisely adjust the direction and strategy guidance of landscape renewal based on the characteristics of the block environment itself, and also provides references for research methods for relevant researchers.

6.1 Main Findings

(1) The landscape imagery of Harbin's historical districts is characterized by a rich folk culture, prominent architectural landscapes, strong commercial vitality, relatively open boundaries, high emotional connection and a strong sense of identity. It shows a distribution feature of "dense in the west and sparse in the east" in space, mainly distributed in South Second Street and South Third Street.

(2) Cognitive image and emotional image form the "two-pillar" structure of the landscape image evaluation system. The role of cognitive imagery in the expression of landscape imagery is higher than that of emotional imagery. Among them, the cognitive image dimension mostly relies on the recognizability of landscape elements and the recognizability of spatial structure. In the dimension of emotional image, the influence of identity is relatively large.

(3) There are significant differences in the influencing factors related to the landscape environment between cognitive imagery and emotional imagery. Cognitive imagery focuses on material environmental factors. The influencing factors of emotional imagery mostly come from the social and cultural aspects.

(4) Cognitive images have obvious correlation features with emotional images. Good cognitive imagery can enhance the level of emotional imagery. Emotional image is the key intermediary for the transformation of cognitive image into landscape image. Especially, the formation of emotional images is the result of the joint action of multi-dimensional cognitive elements. Folk activities, road layout, architectural style and natural landscape are the main driving factors for generating emotional connections.

Therefore, in the process of enhancing the landscape imagery of historical districts in Harbin, emphasis should be placed on the uniqueness of sculptures and small works, the directionality of road layouts, the convenience of functional facilities, the clarity of district boundaries, the reflection of regional culture, and the interactivity of social life. The above findings provide a scientific basis for the protection and renewal of the landscape in historical districts and are conducive to creating the landscape image of historical districts from a micro perspective.

6.2 Strategies for Enhancing Landscape Image

Based on the above analysis, the following optimization strategies are proposed:

Distinctive sculptures and practical leisure facilities are the basic material guarantees for forming a good landscape image. Sculptures with Harbin characteristics, such as ice and snow sculptures and sculptures of historical figures, should be set up at key nodes in the block, taking into account aspects such as material, color, volume and scale to meet people's behavioral needs. The functional adaptability of facilities can be optimized, the night lighting system can be improved, and barrier-free services can be strengthened. For instance, by combining "facility modules", the lighting and rest functions can be integrated into an integrated street fixture, such as "lamp posts + seats", to meet the basic needs of the public.

(2) The guiding road layout and clear block boundaries are the key factors in enhancing the landscape image of the block. Ensure the directionality and continuity of the road layout. Open up dead-end roads, improve the transportation network and enhance the accessibility of neighborhoods. Strengthen road maintenance and management to ensure road safety and smoothness. Strengthen the continuous interface design, adopt methods such as unifying the height of building eaves and characteristic paving transition zones to enhance visual coherence and form clear boundaries of historical districts.

(3) Good social life interaction and distinctive regional culture are the endogenous driving forces for the formation of landscape images. By holding various cultural activities, such as the Ice and Snow Festival and the New Year's Goods Fair, the regional culture of Harbin is passed

down and promoted. Encourage citizens and tourists to participate to enhance the cultural atmosphere and cohesion of the neighborhood. Deeply explore the regional cultural characteristics of Harbin, such as ice and snow culture and European culture, and integrate them into the landscape design of the streets.

6.3 Discussion and Future Research

Based on the "cognition-emotion" theory, this paper explores the landscape imagery of historical blocks in Harbin, investigates the characteristics and spatial distribution patterns of the block landscape imagery, and confirms that emotional imagery is the key intermediary for the transformation of cognitive imagery into landscape imagery, which plays an important role in improving the quality of the block landscape and the public's landscape experience under the background of stock planning.

As a living environment closely related to daily life, the public's evaluation of the landscape image of a neighborhood often carries a strong personal consciousness. Age has a significant influence on the survey results. The samples of this survey are mostly middle-aged and young people aged between 18 and 45. The shortage of the elderly population will to some extent affect the universality of research results. However, to a certain extent, it also makes up for the insufficient attention paid to the middle-aged and young groups in landscape design research.

On the other hand, the research should take into account the influence of seasonal factors. The large temperature differences caused by the temperate monsoon climate in Harbin have a significant impact on the landscape environment. Future research should take into account the differences in landscape imagery between summer and winter in this city and the characteristics of their influencing factors.

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