



Research on the Evaluation of Historical Traces and Cultural Memory in Architectural Heritage

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Abstract. With the deepening of globalization, the importance of cross-cultural communication in business, education, scientific research and other fields has become increasingly prominent. However, in actual communication, cultural differences often become an obstacle that cannot be ignored, leading to inefficient communication or misunderstandings. The study adopts mixed research methods, combining quantitative and qualitative analysis, to deeply explore the cultural collision and integration in cross-cultural communication, especially in the context of Chinese and Western cultural exchanges. Through questionnaire surveys, common cases of misunderstandings and conflicts in cross-cultural communication are collected; then, in-depth interviews are used to conduct in-depth analysis of these cases and explore the cultural factors and communication strategies behind them. Through this study, we reveal the impact mechanism of cultural differences on cross-cultural communication, provide effective communication strategies and suggestions for practitioners in related fields, and promote smooth exchanges between Chinese and Western cultures.

Keywords: cross-cultural communication, cultural differences, communication strategies

1 Introduction

With the rapid development and modernization of cities, the preservation and maintenance of architectural heritage has become the focus of social attention. Architectural heritage is not just the physical entity of bricks, tiles, wood and stone, they represent the history and cultural memory of a city, a country, or even a civilization. Every building carries a story^[1]. They witness historical changes, preserve people's collective memory, and provide valuable cultural resources for future generations. In the past few decades, due to rapid urbanization and excessive pursuit of economic development, many buildings with historical value have been demolished or damaged. This is not only a material loss, but also a cultural and historical loss. However, as people's awareness of the value of cultural heritage increases, the protection of historical buildings and cultural heritage has gradually been put on the agenda^[2]. Through in-depth analysis of the protection and promotion of architectural heritage, the role of architec-

tural heritage in urban branding, and the damage and disrepair of architectural heritage, the article hopes to provide some useful suggestions and directions for the protection and inheritance of architectural heritage.

2 Analysis of the current situation of architectural heritage in urban cultural memory

2.1 Current status of protection and promotion of architectural heritage

Architectural heritage is a testament to China's history and culture, receiving national emphasis. The State Council introduced "Cultural Heritage Day" in 2006, later renamed "Cultural and Natural Heritage Day" in 2017, underlining its cultural significance. Each year, a city hosts, enhancing public understanding and protection awareness through diverse events. The annual celebrations have seen rising engagement and achieved societal impact^[3]. The publication "Introduction to Architectural Heritage in the 20th Century" advances heritage protection, aiding professionals and enlightening the public. Modern technologies like virtual reality showcase historical sites, while movies and literature further promote heritage culture. International initiatives, like the UK's "National Trust", France's heritage day, and the US's tax incentives, offer valuable insights for China. The joint notice by the Central Committee's Propaganda Department, Ministry of Culture and Tourism, and State Administration of Cultural Heritage in February 2022 underscored architectural heritage's significance, setting a distinct roadmap for its preservation and promotion^[4].

2.2 The role of architectural heritage in shaping urban culture

Architectural heritage is like a corridor of time, recording the historical context and cultural heritage of the city. Take the Forbidden City in Beijing and the Bund in Shanghai as examples. These buildings are not just piles of bricks and stones, but also vivid witnesses of a city's historical process^[5]. While inheriting history and culture, they also profoundly affect the city's image and brand positioning. It is not difficult to find that when people mention Suzhou, the first thing that comes to mind is the poetic gardens, while Lijiang is closely connected with the thousand-year-old city^[6]. When architectural heritage is given new life and functions and becomes tourist attractions or cultural activity venues, it can often bring rich economic benefits to the city. The West Lake in Hangzhou and the Slender West Lake in Yangzhou attract countless tourists every year, which not only enhances the economic vitality of the city, but also further deepens people's understanding of the unique charm of these cities^[7]. Some architectural heritages that have been redesigned and restored, such as Kuanzhai Alley in Chengdu and Hanjie Street in Wuhan, are no longer just objects for viewing^[8]. They are closely connected with the daily lives of local residents and have become important places for leisure, entertainment and cultural exchanges. These heritage areas often exude a unique atmosphere of life that preserves traditional features while integrating with modern lifestyles.

3 Issues in the value assessment of architectural heritage in urban cultural memory

3.1 Damage and disrepair of architectural heritage

Much built heritage has suffered damage or disrepair due to a variety of reasons, including the impact of the natural environment, vandalism or long-term neglect. Some ancient buildings with a long history are in a state of decay due to disrepair, weather erosion, or man-made damage^[9]. Such damage not only affects the material value of the heritage, but also breaks or misinterprets its original historical information and cultural connotation.

3.2 Insufficient public awareness of the value of architectural heritage

Although many sites are officially recognized as valuable cultural heritage, in most people's minds, they may just be some buildings that do not attract enough attention and cherish^[10]. This lack of in-depth understanding and emotional resonance sometimes leads to the haphazard modification or destruction of architectural heritage, causing them to lose their original cultural and historical significance.

3.3 The balance between urban development and architectural heritage protection

With the rapid development of cities, how to find an appropriate balance between urban planning and architectural heritage protection has become an urgent problem to be solved. In the process of modern urbanization, land demand, infrastructure construction and the protection of old buildings often conflict. For example, surrounding historic buildings may face demolition to build a subway line or highway. This is not only a material loss, but also a fragmentation of historical and cultural memory.

4 Specific problem-solving strategies

4.1 Strengthen the maintenance and restoration of architectural heritage

For damage and disrepair of architectural heritage, maintenance and repair work must be strengthened. This not only means investing more financial funds, but also cultivating a professional restoration team and formulating scientific restoration plans. You can refer to successful foreign repair cases and use modern technologies, such as 3D printing, to assist in repairing the damaged parts of ancient buildings. At the same time, each maintenance project must undergo strict review to ensure that restoration activities will not damage the original historical and cultural connotation.

4.2 Enhance public awareness of the value of architectural heritage

It is necessary to incorporate architectural heritage education into the curriculum of primary and secondary schools through the education system to cultivate students' historical and cultural awareness. In addition, through exhibitions, lectures, workshops and other activities, more people can understand and participate in the protection of architectural heritage. Television, the Internet and other media can also play a promotional role, drawing public attention through the production of documentaries or special programs on architectural heritage.

4.3 Innovative collaborative model of urban development and heritage protection

By exploring models of collaboration with the private sector, leveraging their funding and technology for heritage conservation, we can ensure that they fully consider the protection of cultural heritage in development projects. For example, when a new commercial project is planned to be launched in a place with historical heritage, the developer can be required to retain and restore the original ancient buildings and integrate them into the new design to achieve the perfect combination of history and modernity.

5 Evaluation and analysis of the value of architectural heritage in urban cultural memory

5.1 Background introduction to architectural heritage

Mogao Grottoes are located at the foot of Mingsha Mountain in the southeast of Dunhuang, 25 kilometers away from the city. The total length of the site is 1,680 meters, with 735 caves built over the past dynasties. The southern area is the Buddhist worship activity center, containing 492 caves with murals and colorful sculptures. The number of colorful sculptures exceeds 2,400, and the murals cover an area of 45,000 square meters. The northern area is where monks practice and live, with 243 caves. Each cave in the Mogao Grottoes represents the perfect integration of architecture, colored sculptures and paintings, showing different artistic forms and historical values from large to small. Figure 1 is a flow chart of architectural heritage value assessment.

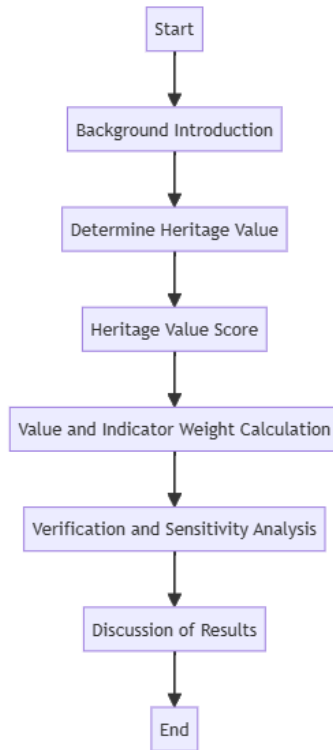


Fig. 1. Flowchart of architectural heritage value assessment

5.2 Determine heritage value and indicator factors

Based on the unique historical background and artistic characteristics of the Mogao Grottoes, combined with the classification of cultural relic values in the "Cultural Relics Protection Law of the People's Republic of China", the value of the architectural heritage of the Mogao Grottoes is deeply constructed. The heritage value of Mogao Grottoes is mainly divided into economic value and cultural value. The economic value covers its environmental value, due to its unique geographical location and attraction to Dunhuang tourism; use value, its functionality as a center for Buddhist worship activities and a place of practice and residence for monks; and emotional value, for believers Deep emotional ties with local people. The cultural value mainly includes historical value, as a representative of ancient Buddhist art; artistic value, due to the high artistic achievements reflected in its rich murals and colored sculptures; and scientific and technological value, showing the technology and craftsmanship of ancient architecture, sculpture and painting . Therefore, the architectural heritage value of Mogao Grottoes is mainly divided into emotional value, historical value, use value, scientific and technological value, environmental value and artistic value.

5.3 Heritage value score

Based on the aforementioned classification of Mogao Grottoes heritage value, further quantitative scoring of each value is the core part of the assessment work. A rating system of 1-10 points is adopted, with 10 points representing the highest level of value among all architectural heritage. The emotional value of Mogao Grottoes is 9 points due to its importance to believers and local people. The historical value, given that it is a unique representative of ancient Buddhist art, is rated 10 points. Use value, due to its practical functionality in religious activities and monastic life, is rated 8 points. The scientific and technological value shows ancient architecture, sculpture and painting techniques, with a score of 7 points. The environmental value, considering its attractiveness and location in Dunhuang tourism, is rated 9 points. The artistic value is rated at 10 points due to the artistic achievements expressed in the rich murals and colorful sculptures inside.

5.4 Calculation of estate value

5.4.1. Value and indicator weight calculation.

All indicators are positive indicators and no negative numbers will appear in the evaluation. In order to achieve comparability among various indicators, each indicator first needs to be dimensionless. Next, in order to determine the weight of each indicator, this evaluation chose to use the entropy weighting method. The entropy weight method determines the weight of each indicator based on the degree of difference between each indicator. The principle of the entropy weight method used here is derived from the concept of entropy in information theory, which is used to represent the uncertainty of random variables. It is used as a weight determination method in multi-criteria decision analysis. Its basic idea is: the greater the variation of the indicator, the greater the amount of information it contains, so the weight should be greater. Here, let the evaluation index set be X , in which there are n evaluation objects and m evaluation indexes. Then x_{ij} represents the score of the i -th evaluation object on the j -th evaluation index. First, dimensionless processing is performed, and then the weight of each indicator is calculated based on the entropy method. The dimensionless processing formula (1) is:

$$x'_{ij} = \frac{x_{ij} - \min(x_j)}{\max(x_j) - \min(x_j)} \quad (1)$$

Dimensionless processing based on the above formula, the entropy method is used to calculate the weight. Formulas (2), (3) and (4) are:

$$e_j = -k \sum_{i=1}^n p_{ij} \ln(p_{ij}) \quad (2)$$

$$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x'_{ij}} \tag{3}$$

$$k = \frac{1}{\ln(n)} \tag{4}$$

The weight value is formula (5):

$$w_j = \frac{1 - e_j}{m - \sum_{j=1}^m e_j} \tag{5}$$

Based on the above formula and the previous scores, the weight results are: emotional value 0.18, historical value 0.20, use value 0.15, technological value 0.12, environmental value 0.17, and artistic value 0.18.

5.4.2 Verification and sensitivity analysis.

In order to ensure the stability and reliability of the evaluation method, the study used sensitivity analysis. A detailed analysis was conducted on the stability of the weights, and the impact on the weights was detected by fine-tuning the scores. First, the sensitivity to weights. By fine-tuning the Mogao Caves heritage value score, it is possible to observe how the weights respond to these changes. To this end, the score of each indicator is adjusted ±1 point and the weights are recalculated. To perform this operation, formula (1) is first used for dimensionless processing, and then formulas (2), (3), (4) and (5) are applied to recalculate the weights according to the entropy weight method. Next, the original and adjusted weights were compared to evaluate the impact of fine-tuned scores on the weights. In addition, the changing trend of weights was also paid attention to.

Table 1. Sensitivity analysis table

value index	Original score	Adjusted score	Original weight	Adjusted weight	Weight change
Emotional value	9	10	0.18	0.19	+0.01
historical value	10	9	0.20	0.19	-0.01
use value	8	9	0.15	0.16	+0.01
Scientific and technological value	7	8	0.12	0.13	+0.01
Environmental value	9	8	0.17	0.16	-0.01
artistic value	10	9	0.18	0.17	-0.01

The results in this table 1 reveal how small changes in ratings affect weighting. For example, when the emotional value score increases from 9 to 10, the weight increases from 0.18 to 0.19, showing the relative stability of the scoring index. Through this sensitivity analysis, the stability and reliability of the heritage value weighting of Mogao Grottoes can be determined.

5.5 Discussion of results

Judging from the above weight value analysis, the historical value and artistic value of Mogao Grottoes exceed the value of other dimensions. This is not only because of the uniqueness of its murals and painted sculptures, but also because of its important position in the history of Buddhist art. Its environmental value also received a high score, which to some extent reflects the important position of the Mogao Grottoes in the tourism industry of Dunhuang and the entire northwest region. At the same time, the high score of emotional value also shows that for the local people and the majority of believers, the Mogao Grottoes are not only a tourist attraction, but also a spiritual destination. Relatively speaking, the use value and technological value of Mogao Grottoes are slightly lower. But this does not mean that the value of these two aspects can be ignored. Especially in the restoration and protection of cultural relics, the value of science and technology is often a key reference. As an important national cultural relic protection unit, the value of the Mogao Grottoes lies not only in its unique artistic style and historical significance, but also in its deep emotional ties with local people, believers and people around the world who care about cultural heritage.

6 Conclusion

By evaluating the value of the Mogao Grottoes in urban cultural memory, the study provides a method and perspective for in-depth understanding and evaluation of the value of architectural heritage. The assessment results clearly pointed out that each cultural heritage has its own unique and irreplaceable value, which is the crystallization of time, history, art and human wisdom. In today's society, rapid urban development and modernization may lead to the damage or loss of many valuable cultural heritages. Therefore, it is the shared responsibility of all people to protect and preserve this heritage and ensure that it is passed on into the future. Only by fully recognizing the value of architectural heritage in urban cultural memory can effective measures be taken to protect and inherit these precious resources.

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