

A Study on the Derivation of Ancient Architectural Motifs Based on Schema Theory

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Abstract:

Ancient architecture not only carries a rich historical and cultural heritage, but its exquisite and unique patterns are also treasures for study, reflecting the aesthetic and social values of the ancients. As time passes, the importance of preserving and inheriting these precious cultural heritages has become a significant topic. Schema theory, as a tool for analyzing and interpreting the derivation of patterns, offers a new perspective, enabling a more in-depth and systematic study of ancient architectural patterns. This paper, by summarizing the key concepts of schema theory, meticulously categorizes and analyzes the characteristics of patterns in ancient architecture, and delves into the derivation of ancient architectural patterns based on schema theory to propose effective strategies for preservation and inheritance. At the intersection of tradition and innovation, this study aims to provide theoretical support and practical guidance for the preservation of ancient architectural patterns.

Keywords:

Schema Theory, Ancient Architecture, Pattern Derivation

1. Introduction

Ancient architecture, as a witness of history, carries on the legacy of past cultures through its unique designs and patterns. These patterns are not mere decorations, but embody rich cultural meanings and social information. However, with the process of modernization, these cultural symbols are facing severe risks of destruction and oblivion. The theory of schema, derived from the field of psychology, has recently been introduced into the study of patterns, providing new methodological approaches for the analysis and understanding of traditional patterns. Through an overview of schema theory, this paper aims to elucidate its value in the analysis of patterns in ancient architecture, and based on this, explore the classification, characteristics, and processes of derivation of patterns in ancient architecture. Moreover, considering the importance of protection and heritage, this paper will also discuss the main challenges faced and possible strategies, in order to provide new perspectives and methods for the conservation of ancient architectural cultural heritage.

2. Overview of Schema Theory

The schema theory originated from cognitive psychology, emphasizing the role of preset frameworks in knowledge processing. Applied to the study of ancient architectural patterns, this theory can effectively reveal the basic structure and generative logic of pattern design. The silent patterns of ancient architecture, through the lens of schema theory, seem to be endowed with voices, telling ancient stories and showcasing the wisdom and aesthetics of the ancients. Through the analysis of schema theory, it can be seen that the patterns of ancient architecture are not chaotic decorations, but rather rigorous and orderly visual language expressions rich in meaning. Each pattern is based on a certain pattern structure, which may originate from nature, such as landscapes, flora and fauna, or from humanity, such as totems and myths. The ancients derived various variations and combinations based on these patterns, forming a unique pattern language under specific cultural backgrounds. However, there are challenges in interpreting the patterns of ancient architecture using schema theory. The biggest challenge lies in accurately identifying and understanding the hidden pattern structures in ancient architectural patterns. After all, these patterns were created in different historical periods and cultural backgrounds, so the meaning of their pattern structures may vary with time and region. Therefore, the study of the derivation of ancient architectural patterns not only requires a profound understanding of schema theory, but also a wide range of historical and cultural knowledge as support. In addition, the application of schema theory in the study of the derivation of ancient architectural patterns also provides a rich source of inspiration for contemporary design. By analyzing and reconstructing the pattern structures of ancient architectural patterns, modern designers can create patterns that not only have traditional charm but also conform to modern aesthetics. This cross-era design language not only promotes cultural heritage but also stimulates a new understanding of history and culture. In this field, schema theory is not a silver bullet, but it is a precise tool in the hands of researchers, helping them unveil the layers of derivation of ancient architectural patterns. Through the analysis of the basic structure of patterns, researchers can grasp the rules of pattern variations and achieve a deeper understanding of the inherent logic of ancient architectural culture. Overall, the application of schema theory in the study of the derivation of ancient architectural patterns opens a gateway to the ancient world of wisdom and aesthetics [1]. Through this gateway, modern people can not only glimpse the artistic achievements of the ancients but also draw inspiration from them, integrating classical aesthetics with modern design concepts to create new works of significance to the times. This process is both a continuation of ancient culture and a driving force for innovation in modern design.

3. Classification and Characteristics of Ancient Architectural Motifs

Ancient architectural patterns are not only an essential part of architectural art, but also carry rich cultural significance and historical value. They are the crystallization of ancient wisdom, reflecting the aesthetic taste and social customs of different eras. Classifying and identifying the characteristics of ancient architectural patterns helps us to better understand the artistic connotations of these unique patterns and their evolution in the historical process. Ancient architectural patterns can be roughly divided into several categories based on their formation: naturalistic patterns, symbolic patterns, geometric patterns, and text patterns. Each category of patterns has its unique artistic expression and cultural significance, through which we can glimpse

into the ancient way of life and their understanding and respect for nature and society. Naturalistic patterns usually directly borrow from the forms of nature, such as flowers, animals, cloud patterns, etc. These patterns are vivid and natural, showcasing the skill of imitation. For example, the common lotus pattern is not just because of its beautiful appearance, but also because the lotus symbolizes purity and elegance in culture. Symbolic patterns are rich in profound cultural meanings, such as dragons, phoenixes, and other mythical creatures, which often represent symbols of auspiciousness and power. In ancient times, these patterns were often used in royal architecture, displaying the sacred and inviolable authority. Geometric patterns are composed of simple geometric shapes, such as squares, lattices, etc. These patterns emphasize symmetry and balance, reflecting the ancient pursuit of order and harmony. Geometric patterns are widely and deeply used, appearing in almost every era of architecture. Text patterns combine the art of writing with architectural decoration, where calligraphy is often directly carved as a relief on the building. This not only showcases the charm of calligraphy art but also turns the building into a medium for transmitting cultural information. Through the study of ancient architectural patterns, we can easily discover that these patterns are not randomly decorative. They differ based on the use, location, and construction time of the building. For example, religious buildings and royal buildings have significant differences in pattern selection, reflecting the spiritual pursuits and functional needs behind different buildings. A detailed exploration of these patterns can also help us understand the ancient people's worldview, outlook on life, and values. Behind every stroke and line is a yearning for a better life and a vision for the future. In conclusion, ancient architectural patterns serve as an important bridge connecting the past and present, nature and culture. They not only enhance the artistic charm of ancient architecture but also provide a window for modern people to understand ancient cultures. Through the evolution of each pattern, we can glimpse the face of an era, understand what people in an era are thinking, longing for, and how they express their aesthetic emotions and cultural beliefs through architectural art.

4. Derivation analysis of ancient architectural motifs based on schema theory

4.1. Application of schema theory in the study of ancient architectural motifs

Schema theory emphasizes the role of mental structures in human cognitive activities. In recent years, it has increasingly been applied in research across various domains, including the derivation and analysis of patterns in ancient architectural designs. By deconstructing and reassembling the fundamental elements within these architectural patterns, schema theory aids researchers in deeply comprehending the cultural and historical contexts of these patterns, thereby fostering the development of novel design inspirations and creative directions. Ancient architecture serves not only as a testament to history but also as a vessel for cultural heritage. Patterns within ancient architecture are imbued with profound cultural significance and historical insights. Utilizing schema theory to interpret these patterns can unveil the basic patterns underlying them, namely the recurring design patterns and themes. These patterns not only form the core of the patterns but also reflect the aesthetic preferences and cultural characteristics of the society at that time. The formation of elements is a direct reflection of the creator's mental schema, embodying the inevitable connections between creator and subject matter, shared cultural cognition, geographical environment, folk beliefs, and production and lifestyle [2]. When

applying schema theory to study the derivation of patterns in ancient architectural designs, the primary step is to classify and encode these patterns. Researchers accomplish this by meticulously analyzing the shapes, lines, and arrangements within the patterns, extracting representative pattern elements. For instance, the imagery of dragons and phoenixes is exceedingly common in the decorative arts of ancient Chinese architecture; they symbolize not only auspiciousness but also power [3]. Through schema theory, researchers can identify the common pattern substrates behind these patterns, such as symmetry and repetition, which are common aesthetic techniques. Thanks to this analytical approach, researchers can further explore how to transform these ancient patterns into modern design languages. For example, by introducing elements of classical patterns into modern architectural designs, traditional aesthetics are fused with contemporary design styles, creating artworks that possess both historical significance and modern aesthetic appeal. This innovative design is not merely a superficial replication but rather a contemporary interpretation and continuation of the cultural spirit of ancient architecture. It is worth noting that the application of schema theory in the study of patterns in ancient architecture is not without its challenges. Each type of pattern in ancient architecture is unique, carrying rich cultural and historical information. Therefore, a profound understanding and respect for the cultural background are imperative when conducting schema theory analysis. Superficial interpretations may lead to misunderstandings of the patterns' meanings, thus affecting the accuracy of derivative designs and the transmission of culture. In conclusion, schema theory offers a new perspective and methodology for the study of patterns in ancient architecture. By identifying and analyzing repeated patterns within these designs, it not only enhances our understanding of ancient architectural culture but also provides rich sources of inspiration for modern design. Despite ongoing challenges, the application of schema theory undoubtedly paves the way for an innovative integration of the past and present, bridging the gap between history and the future. In cultural conventions, the image archetype and knowledge structure of an artistic style is a process that gradually emerges [4].

4.2. Commonality and Difference Analysis between Patterns

In the study of the derivation process of ancient architectural patterns based on schema theory, analyzing the commonalities and differences between patterns becomes particularly important. Schema theory, as a framework for understanding graphic rules and relationships, offers a fresh perspective to identify and explain the patterns in ancient architecture. These patterns are not merely decorative expressions; they embody profound cultural significance and historical background. Through the application of schema theory, researchers can reveal not only the uniformity in form among these patterns, but also explore their coherence at a cultural level. For example, many ancient architectural patterns stem from the same cultural background, exhibiting similar geometric compositions or symbolic meanings visually, such as the patterns of dragons and phoenixes symbolizing power and wealth in multiple civilizations. However, differences are also evident, primarily manifesting in the varied interpretations and uses of patterns in different regions. Take the dragon pattern for instance, in traditional Chinese culture, the dragon symbolizes auspiciousness, while in certain Western cultures, it may represent evil. Schema theory can deeply analyze the roots of these differences, exploring how patterns in different cultural contexts evolve to meet the needs of their social and cultural environments. For scholars engaged in the study of ancient architectural patterns, understanding these commonalities and differences not only aids in gaining an in-depth understanding of

specific cultures but also promotes cross-cultural academic exchanges. Through comparative analysis, scholars can better comprehend how different cultures maintain their uniqueness while also sharing certain universal visual or symbolic meanings through patterns. Schema theory also fosters the generation of innovative design. Designers can reinterpret traditional elements of ancient architectural patterns with modern aesthetics, creating artistic works that respect the original culture while embodying a contemporary sense. This derivation is not merely a replication but a form of cultural adaptation and recreation. Therefore, applying schema theory to analyze the commonalities and differences in ancient architectural patterns is not only an academic exploration but also a way to deeply understand and preserve cultural heritage. This analysis not only enhances our understanding of history but also provides rich sources of inspiration for modern design. In this process, each interpretation of a pattern is a tribute to past wisdom and a glimpse into endless possibilities for the future [5].

5. Case Study of Ancient Architectural Pattern Derivation

5.1. Categories of Decorative Totems in Jiuxian Village

This paper selects Jiuxian Village in Mazhang District, Zhanjiang City, Guangdong Province, China, as the research subject to verify the applicability of schema theory in the study of pattern derivation, and to explore how to rejuvenate these architectural decorative patterns originating from cultural totems and the natural world with the vitality of the times. Jiuxian Village is known for the harmonious beauty between its traditional architecture and new rural construction, achieving a delicate balance between the ancient architectural complex weathered by time and the new rural buildings catering to modern living needs. Figure 1 displays the scenery of Jiuxian Village. Over 20 traditional dwellings still exist in the village, which, aside from the marks left by time, have been well preserved without human destruction. Tai Mountain Mansion, Peng's Ancestral Hall, and the residential clusters are the most representative ancient buildings, commonly displaying typical characteristics of Guangfu architecture and decoration, and reflecting the ancients' pursuit of beauty and the crystallization of their wisdom.

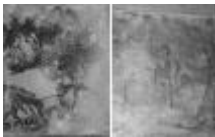


Figure 1. Scenery of Jiuxian Village.

Through in-depth research on the ancient architectural patterns of Jiuxian Village Table 1, we can better understand and inherit these precious cultural heritages, allowing them to breathe new life in modern society. In the traditional dwellings of Jiuxian Village, whether it is the main room, side room, or gate tower, the ridges are carved with dragon and phoenix patterns, and the walls are painted with auspicious designs such as carp playing in water and prosperous blossoms [6]. These architectural decorations not only carry rich folk culture and ethical beliefs but also display the unique secular social etiquette stories and human interest stories found in ancient Chinese murals. They are elegant and accessible landscapes, flowers, and

birds paintings, as well as calligraphic works transcribing widely circulated poetry [7]. The cultural roots and symbolic meanings of the decorative patterns of Jiuxian Village's ancient buildings mainly originate from historical culture, natural environment, and folk tales.

Table 1. *Classification of Architectural Decorative Totems in Jiuxian Village.*

Category	Decorative Features		Symbolic Meanings
Plants		Natural elements of the Lingnan region are ingeniously integrated into the architectural decorative patterns, showcasing distinct regional cultural characteristics.	These patterns symbolize beauty and happiness, and imply the diversity and richness of life, reflecting the harmonious coexistence between humans and nature.
Animals		Animal and plant patterns often complement each other in decorative art, creating a widely appealing decorative aesthetic.	The appearance of animal patterns symbolizes the yearning for a good life and deeply reflects rich folk culture and legendary stories.
Humanities		Decorative murals integrate elements of distinctly secular Chinese paintings, mythological stories, and folk tales.	These mythological stories imply moral education and embody the folk beliefs and rich imagination of the people of Jiuxian Village.

5.2. Visualization Path of Schema

In traditional Chinese architecture, the “Chiwen” is a very common decorative element, which is one of the nine sons of the dragon in Chinese mythology, symbolizing disaster elimination, warding off evil, and protecting the prosperity of the family. In the architectural decoration of Jiuxian Village, “Chiwen” is also ubiquitous, playing the role of a guardian in the ridges and gable walls, and also serving the practical function of integrating the drainage system Figure 2 and Table 2. It is particularly worth mentioning that there is a winged fish totem called “Dragon Fish” in the folk tales of Jiuxian Village, which also appears on the gable walls of ancient buildings. It is evident that in the cultural schema of Jiuxian Village, the “Chiwen” is more than just a visual architectural decoration; it embodies the people's understanding and reverence for the unknown. Therefore, when we attempt to regenerate “Chiwen” as a common visual element, it is imperative to conduct an in-depth analysis based on the cognitive structure of the community, following the generalized schema derivation path. Throughout this process, the significance of its cultural background mapping must not be overlooked, otherwise, the concept will fail to take root and integrate with the local cultural context. This also implies that when reviving traditional art, we must pay special attention to the characteristics particular to the locality. Regenerative creation is not only the best form of inheritance and protection of traditional culture but also a modern interpretation and respect for its essence. Through such innovative practices, we can ensure the vitality of traditional

culture continues and that it is revitalized with new life and significance in contemporary society.



Figure 2. “Chiwen” Decoration in Jiuxian Village.

Table 2. Generalized Schema Derivation Analysis Based on Group Cognitive Structure.

Pattern	Derivation Domain	Features
	IP Design	IP design with local cultural functionality
	Painting	Modern creation as a language of painting
	Commercial Design	Satisfying local daily use commercial products
	Architectural Decoration	Flexible application of decoration in new architecture

6. Protection and Inheritance Strategies of Ancient Architectural Motifs

6.1. Records and Documentation

Ancient architecture, as a precious cultural heritage of our nation, embodies irreplaceable historical, cultural significance, and aesthetic value through its patterns. Therefore, the protection and inheritance of ancient architectural patterns are crucial. Among them, recording and documentation play a vital role. Through systematic recording and documentation, we can not only help us understand the form and characteristics of ancient architectural patterns more comprehensively and accurately but also delve into the essence and inheritance of ancient culture. In the process of recording and documentation, it is essential to start with photography. Through photographs, we can present ancient architectural patterns in front of us authentically, allowing people to feel their unique beauty. Moreover, photographs can also become important documentary materials for future generations to study and research, providing valuable research objects for them. In addition, the drawing of diagrams is indispensable for recording ancient architectural patterns. Through precise drawings, we can present the composition and proportion of ancient architectural patterns clearly, providing important reference materials for future research and reproduction. Furthermore, the writing of textual descriptions is crucial for a deep understanding and interpretation of ancient architectural patterns. Through detailed textual descriptions, we can record the historical origins, cultural significance, manufacturing techniques, etc., of ancient architectural patterns in a detailed manner, allowing these precious cultural heritages to be more comprehensively inherited and protected. Recording and documenting ancient architectural patterns not only contribute to the protection and inheritance of these cultural heritages but also help us appreciate the wisdom and artistic accomplishments of ancient people more profoundly. Patterns in ancient architecture contain rich historical information and cultural significance, embodying the essence of traditional Chinese architectural culture. Through recording and documentation, we can permanently preserve these precious cultural heritages in the corridor of history, providing rich research materials and learning opportunities for

future generations. It is worth mentioning that in the process of recording and documentation, we need to focus on accuracy and meticulousness. Only in this way can we ensure that the records we leave behind are reliable and can provide strong support for the protection and inheritance of ancient architectural patterns. In today's society, the protection and inheritance of ancient architectural patterns have become the responsibility and mission of every citizen. Recording and documentation, as the first step in protecting ancient architectural patterns, require the diligent efforts and attention of each one of us. Let us join forces, work together, pass on this precious cultural heritage of ancient architectural patterns, and allow future generations to experience this unique cultural charm. May the beauty of ancient architectural patterns continue to spread and become a gem of our national culture, adding brilliance to the inheritance of our civilization [8].

6.2. Restoration and Preservation

Over time and with the erosion of the natural environment, many ancient architectural patterns are facing severe damage and fading, in urgent need of restoration and protection. In the process of restoring and protecting ancient architectural patterns, we are not just repairing some worn-out stone carvings or paintings, but inheriting a culture, a spirit, and safeguarding a piece of history, a memory. Restoring and protecting ancient architectural patterns is not simply about patching up and painting over, but through scientific and meticulous work, restoring the original charm of the patterns, ensuring their preservation and longevity. Firstly, for effective restoration and protection of ancient architectural patterns, we need to conduct a detailed investigation and analysis, understanding the materials, structure, and damage of the patterns, providing a scientific basis for the subsequent restoration work. Then, based on the actual situation, select appropriate restoration methods and materials for the restoration and protection work. In this process, it is important to adapt to ancient building materials to ensure the stability and longevity of the restoration effects. Maintenance of ancient architectural patterns requires attention to long-term sustainability. Regular maintenance and inspection are essential to help us promptly identify and address issues on the patterns, preventing further damage. Additionally, appropriate protective measures can be taken, such as establishing waterproofing measures, maintaining ventilation, and reinforcing structures, to protect the patterns from external environmental damage. Furthermore, restoring and protecting ancient architectural patterns requires respect for the original appearance, avoiding excessive repairs and alterations, to preserve their original cultural value and beauty. In the process of restoring and protecting ancient architectural patterns, we should approach with awe and reverence. These ancient buildings are not just a form of architecture, but a cultural symbol, representing the crystallization of our national traditional cultural wisdom. Therefore, in the process of restoring and protecting ancient architectural patterns, we need to carefully nurture them, treating them with the meticulousness of caring for an elder, respecting their history and traditions, preserving their authenticity. Restoring and protecting ancient architectural patterns is a challenging and meaningful task. Through this work, we are not only restoring an ancient building, but also passing down a culture, a history, passing on this precious heritage to future generations, allowing them to continue to appreciate the deep-rooted history and cultural charm. May ancient architectural patterns be restored and protected, forever passed down as a shining gem of our cultural heritage.

6.3. Digitization & Virtual Presentation

With the advancement of the times, digitalization and virtual display, as modern technological means, provide a new way for the protection and inheritance of ancient architectural patterns. Digitalization delves into and presents ancient architectural patterns, while virtual display makes it more convenient for more people to showcase these precious cultural heritage. Through digitalization and virtual display, not only can ancient architectural patterns be presented to the public in a more intuitive and comprehensive way, but their beauty and value can also be more widely disseminated. Digitalization is the process of rapidly, accurately, and comprehensively recording and preserving ancient architectural patterns. By digitizing ancient architectural patterns, they can be materialized, constructing three-dimensional models or digital images to more clearly display their form and structural characteristics. Digital technology can help us achieve high-precision measurement and restoration of ancient architectural patterns, making the inheritance of ancient architectural patterns clearer and more reliable. Virtual display, through technologies such as the internet and virtual reality, presents ancient architectural patterns in front of people, allowing them to experience the unique charm of these precious cultural heritages without the need to travel long distances. Digitalization and virtual display represent the perfect combination of traditional culture and modern technology, opening up new horizons for the inheritance of ancient architectural patterns. Through digitalization and virtual display, we can present ancient architectural patterns on a broader stage, not only allowing more people to understand and appreciate these cultural treasures but also providing rich research materials and learning opportunities for future generations. The application of digitalization and virtual display technology can not only promote the protection and inheritance of ancient architectural patterns but also enhance the dissemination and impact of ancient architectural culture, allowing these precious cultural heritages to be better understood and valued. In the process of digitalization and virtual display, we need to focus on technological innovation and the strengthening of conservation awareness. Digital processing requires high-precision measurement and reconstruction technology to ensure the authenticity and reliability of digitalization. Virtual display needs to consider how to leverage the internet and modern communication technologies to involve more people in the appreciation and discussion of ancient architectural patterns. Additionally, we need to pay attention to the impact of digitalization and virtual display on the protection of ancient architectural patterns themselves, avoiding damage to them from excessive display and openness. As important means for the protection and inheritance of ancient architectural patterns, digitalization and virtual display require us to delve deeper and apply them more extensively. Through digitalization and virtual display, we can bring ancient architectural patterns out of museums and cultural heritage conservation units and into people's lives, studies, and work, becoming a part of our inheritance. May digitalization and virtual display technologies better serve the protection and inheritance of ancient architectural patterns, becoming a brilliant business card for our traditional culture, forever passing down to provide future generations with a more colorful cultural heritage [9].

7. Conclusions

Ancient architectural patterns, as an important cultural heritage, deserve to be known and understood by more people due to their unique aesthetic value and profound cultural significance. The derived research of ancient architectural patterns based on schema theory not only broadens the theoretical perspective of the study of ancient architectural patterns, but also provides new ideas and methods for the

protection, inheritance, and innovation of these patterns. Through a deep analysis of the application of schema theory, the classification and characteristics of ancient architectural patterns, and the derived analysis of patterns based on schema theory, this study reveals both the commonalities and differences among patterns, emphasizing the necessity and urgency of strengthening the protection of ancient architectural patterns, and proposing approaches to address the current situation, challenges, and opportunities for innovation. In the face of the dual challenges of globalization and modernization, only by deeply understanding and properly utilizing the cultural significance and aesthetic value behind these ancient patterns can we better protect and inherit these invaluable cultural assets, allowing traditional culture to shine with new vitality in modern society.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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