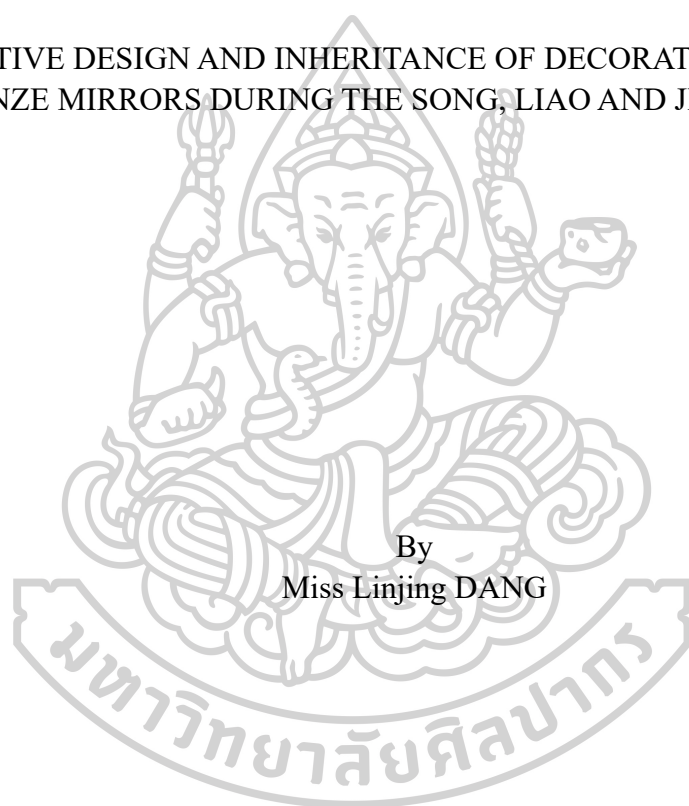




INNOVATIVE DESIGN AND INHERITANCE OF DECORATIVE PATTERNS ON  
BRONZE MIRRORS DURING THE SONG, LIAO AND JIN DYNASTIES



A Thesis Submitted in Partial Fulfillment of the Requirements  
for Doctor of Philosophy Design  
Silpakorn University  
Academic Year 2024  
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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาคุณวุฒิบัณฑิต

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ลิขสิทธิ์ของมหาวิทยาลัยศิลปากร



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Title                    INNOVATIVE DESIGN AND INHERITANCE OF DECORATIVE  
 PATTERNS ON BRONZE MIRRORS DURING THE SONG,  
 LIAO AND JIN DYNASTIES  
 By                        Miss Linjing DANG  
 Field of Study        Design  
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This research aims to explore the modern innovative design methods of bronze mirror decorative patterns in the Song, Liao and Jin Dynasties and the inheritance of Chinese traditional art and culture. Starting from the theories of shape grammar, semiotics and parametric design, the researchers extracted the design elements of traditional patterns and systematically analyzed the formal characteristics, cultural implications and design logic of bronze mirror patterns in the Song, Liao and Jin Dynasties. The research method adopts a mixed research method, combining qualitative and quantitative research methods. The qualitative research methods include literature research, comparative analysis, field investigation and expert consultation. The quantitative research adopts a questionnaire survey method to investigate the target population's awareness and satisfaction with the bronze mirror decorative patterns in the Song, Liao and Jin Dynasties, as well as their needs and suggestions for the innovative design of modern bronze mirror decorative patterns. The research results show that the innovative design of bronze mirror patterns combined with shape grammar has enriched the new form of Chinese traditional cultural creative design, and at the same time provided support and reference for the modernization and digital reconstruction of traditional patterns and contemporary innovative design, and promoted the inheritance of Chinese cultural and artistic heritage.

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## CHAPTER 1

### INTRODUCTION

This chapter will lay the foundation for this research, first introducing the research background of bronze mirror decoration patterns in the Song, Liao and Jin dynasties in China, then clarifying the statement of the research problem, and further elaborating on the research objectives, research significance and research scope. Finally, this chapter will present a diagram of the research framework and outline relevant keywords and definitions.

#### 1.1 BACKGROUND OF THE RESEARCH

As a direct reflection of the thoughts and culture of each historical period, decorative patterns are influenced by the politics, economy, culture, religion, customs, ethics, aesthetics and other art of the time, and often show the unique qualities, values and artistic style of a particular era.

The Song Dynasty was an era ruled by literati, and literati culture played a leading role at that time, thus forming the elegant connotation of design art. The decorative patterns of the Song Dynasty inherited and surpassed those of the Tang Dynasty. On the basis of the decorative patterns of the Tang Dynasty, they absorbed the culture of the Later Zhou Dynasty, Southern Tang Dynasty, Western Shu and other places. In addition, the mutual influence of the patterns of the Liao, Western Xia and Jin ethnic minorities in the same period made the decorative patterns of the Song Dynasty present a new look. The format and subject matter were more innovative than those of the previous generations, and gradually developed into a rich and lively, simple and realistic, fresh and elegant style.

The Liao and Jin dynasties were deeply influenced by Han culture, and their decorative art was the product of the intersection of Central Plains culture, grassland nomadic culture and foreign culture. The decorative patterns they created absorbed a wide range of artistic forms from the Song Dynasty while retaining their unique national characteristics. The art of the Liao and Jin dynasties went through a process of imitating foreign culture, organically integrating foreign culture with their own national culture, and finally forming unique decorative patterns, which is very worthy of our study.

Since the Song, Liao and Jin dynasties were an important stage in the transition of Chinese feudal society from the Middle Ages to the modern times, the decorative pattern art during this period played a role in inheriting the past and ushering in the future, and had an important historical position. It not only provided an excellent model and valuable inspiration for the development of decorative pattern art in the Yuan, Ming and Qing dynasties, but also laid the foundation for the pattern of Chinese decorative

patterns, and had a great influence on the decorative patterns of the Yuan, Ming and Qing dynasties and the decorative patterns of modern Chinese folk (Gu, 2011).

In the long history, bronze mirrors, in addition to their practical function of reflecting one's appearance, have also been endowed with profound cultural connotations. In ancient Chinese history and culture, mirrors were regarded as a symbol of the rise and fall of a country. Emperor Taizong of Tang said, "Using bronze as a mirror, one can correct one's clothes and hats; using history as a mirror, one can understand the rise and fall; using people as a mirror, one can understand gains and losses." In addition, the ancients cast beautiful poems on the back of the mirror and painted beautiful women looking at the mirror as masterpieces. Graphic art and bronze mirrors are mutually connected and become eternal. Mirrors, as tokens of love, are even more interlinked from ancient times to the present. The ancients turned bronze mirrors into art, and incorporated the rise and fall of the country, political ideas, life dreams, and the love between children and children into bronze mirrors (Cammann, 1995).

So, what was the popular aesthetic trend during the Song, Liao and Jin dynasties is also an important issue that we need to recognize in the context of our research. The popular trend of Song Dynasty aesthetics emphasized the pursuit of nature, abandoned formalism and standardized aesthetic concepts, and advocated free, real, natural and profound aesthetic tastes. In Song Dynasty culture, artists' perception and understanding of nature were popular, focusing on expressing the changes, light and shadow, atmosphere, etc. of nature; Song Dynasty aesthetics advocated a unique artistic style and emphasized the quality and refinement of works of art; Song Dynasty painters and literati attached importance to the depiction of details and were good at using delicate brushstrokes to express the true appearance and inner emotions of objects; Song Dynasty aesthetics focused on the inner spiritual realm, advocated the connection between aesthetics and culture, philosophy, morality, personality, etc., emphasized the artistic conception and appeal of works of art, and believed that art should express profound connotations and emotional attitudes.

A number of famous Khitan painters emerged in the Liao Dynasty, such as Yelu Bei, Hu Qian, Yelu Tizi, Xiao Lu, Gao Yi, etc. Their works have different features from those of the Han paintings in the Central Plains, with prominent characteristics of border areas. Most of the contents show the grazing of water and grass, horseback hunting, and the four seasons of mountains, rivers and grasslands in the north. The form and language of painting not only adapt to the aesthetic needs of the ethnic group and reflect the aesthetic taste of the ethnic group, but also are directly influenced by the paintings of the Tang, Five Dynasties and even Song Dynasties, reflecting the exchange and integration of cultural arts among different ethnic groups and forming a painting feature of inclusiveness.

On the one hand, the decorative style of the Jin Dynasty has a simple and vigorous style, which is reflected in the bronze mirrors and jades of the Jin Dynasty. The bronze mirrors and jades of the Jin Dynasty have simple images. Precious metals are rarely used in bronze mirrors. Instead, they rely on fine workmanship, clever composition and

simple images to achieve a good decorative effect. The whole object looks simple and unpretentious, but has an unforgettable effect. On the other hand, it pursues a magnificent decorative effect. The Jin Dynasty artworks that have been discovered are more pursuing a golden-like brilliant decorative effect, which is related to the habits of the northern ethnic minorities.

Based on the above information, we explore the cultural connotation of decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties and the redesign value of traditional Chinese patterns, analyze the social and artistic attributes of decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties, extract pattern intention vocabulary, assist graphic thinking, use shape grammar to substitute graphics to obtain new patterns, combine them with bronze mirror unit patterns to generate new pattern factors with recognition and design value, and carry out design practice of new pattern factors.

## 1.2 PROBLEM STATEMENT

With the continuous progress of modern science and technology, traditional patterns and decorative styles are experiencing a strong impact from modern civilization, and traditional cultural concepts are also experiencing the test of modern thought. In the local culture of Datong City, Shanxi Province, China, the Song, Liao and Jin dynasties were a glorious period in local history. In Chinese history, there is a unique phenomenon that a dynasty has to set up several secondary capitals in addition to the capital. Datong was the secondary capital during the Liao and Jin dynasties, responsible for the country's military defense. During this period, Datong had a large population, convenient transportation, a high level of economic and cultural development, and very developed Buddhist culture and art. With the establishment of its status as a secondary capital, Datong has not only become the regional political center of the north of the Liao Dynasty, but also one of the most important economic and cultural centers of the Liao Kingdom after more than a hundred years of precipitation. It has strongly promoted the social progress of this region. The nomadic culture from the grasslands and the farming culture of the Central Plains have blended and collided to create a brilliant and unique regional art and culture.

As an independent system in ancient my country's bronze culture, bronze mirrors are an important part of Chinese art and culture, and have important reference value for understanding and studying Chinese history, culture and art. The casting process, copper quality, decorative patterns, inscriptions, etc. of bronze mirrors in different dynasties all reflect the specific background of the times. They are important physical materials for us to understand and study the political economy, ideological and cultural social life, folk customs, religious beliefs, aesthetic art and other aspects of ancient China.

As one of the nine ancient capitals of China, Datong has a long history and culture. Multi-ethnic cultures collide, communicate and merge here, presenting a colorful

historical style. However, Datong is not as well-known as Beijing, Nanjing, Xi'an and other ancient cities. In this social background, the local government's policy support for promoting and carrying forward local art and culture is urgently needed to vigorously promote and carry forward local culture and art, and show more of China's cultural confidence and charm.

In China, the current status of research on the inheritance and innovative design of bronze mirror decorative patterns is as follows:

1) There are more studies on bronze mirror decorative patterns in the Han and Tang dynasties, and significantly fewer studies on the Song, Liao and Jin dynasties.

2) Research on bronze mirror decorative patterns tends to focus more on historical background, bronze mirror aesthetics, archaeological value, etc., while there are fewer research directions on modern innovative design and artistic inheritance of decorative patterns.

3) There is a lack of in-depth exploration and value expression of the cultural connotation of bronze mirror decorative patterns in the Song, Liao and Jin dynasties.

Today, we should establish the value of protecting cultural heritage. This study combines the decorative patterns of bronze mirrors with modern art design products, proposes innovative design angles and forms, and creates new methods for the development and inheritance of cultural arts. From the perspective of visual design, the research method of extracting the basic shapes of patterns, assisting graphic thinking, and using shape grammar to substitute graphics to obtain new patterns can increase public interest, achieve the role of protecting Chinese traditional culture and art and inheritance, and spread the knowledge of ancient Chinese art and cultural heritage. It is also of reference significance to modern art design majors.

### **1.3 OBJECTIVE RESEARCH**

The objectives are summarized in the following 3 points:

1) To study the cultural connotation and artistic value of the decorative patterns of bronze mirrors in Datong City, Shanxi Province, China during the Song, Liao and Jin Dynasties, analyze their artistic aesthetic characteristics, and conduct in-depth research on the composition, shape, lines, and categories of representative bronze mirrors.

2) To combine with image analysis methods, analyze the integration of folk culture and foreign culture in bronze mirrors, and study the decorative meaning and unique charm of bronze mirrors in the Song, Liao and Jin Dynasties.

3) To extract the basic shape of the pattern, assist graphic thinking, and use shape grammar to substitute graphic design to create innovative patterns with modern aesthetic forms.

## 1.4 RESEARCH HYPOTHESIS

H1: The decorative patterns of bronze mirrors in Datong during the Song, Liao and Jin Dynasties have systematic artistic characteristics in composition, line expression and classification, and reflect strong regionality and timeliness in cultural connotation. Its aesthetic value and composition logic can provide references for the form and content of contemporary pattern design.

H2: The folk cultural symbols and artistic expressions contained in the decorative patterns of bronze mirrors during the Song, Liao and Jin Dynasties, as precious artistic and cultural heritage resources, have important cultural heritage value. Through in-depth analysis and design practice of its decorative images, combined with the intangible cultural heritage skills of bronze carving, it is possible to not only explore the traditional cultural connotation behind it, but also provide new paths and design practice methods for the modern dissemination and protection of intangible cultural heritage.

H3: Through the extraction and design innovation of the basic forms of bronze mirror decorative patterns through shape grammar design theory, the logical and systematic innovative design expression of traditional patterns can be realized, and modern aesthetic characteristics can be given to them on the basis of maintaining their traditional cultural roots, thereby providing feasible design methods and paths for the contemporary expression of traditional decorative patterns.

## 1.5 SIGNIFICANCE OF THE RESEARCH

1) This research will help promote Chinese art and culture and increase the popularity of Chinese bronze mirrors.

Bronze mirrors are an important part of Chinese art and culture and have important reference value for studying Chinese history, culture and art. This study will help Datong City, Shanxi Province, China better promote its splendid and unique regional art and culture, bring Datong City, a Chinese tourist city, into the global vision, and let more people feel the artistic charm of bronze mirror patterns from the Song, Liao and Jin dynasties. At the same time, it will enable Chinese traditional culture to spread to countries around the world, not only providing a reference for people to better understand China's history and current situation, but also showing Chinese art and culture, Chinese spiritual connotation and Chinese cultural confidence in the global vision.

2) This research will help provide new research theoretical ideas and modern innovative design methods, and enrich the new forms of creative design of Chinese traditional culture.

The innovative design of the graphic design of bronze mirror decorative patterns, combined with the method of decorative pattern graphic design, provides modern designers with new design ideas and basis.

3) This research will help promote the inheritance of Chinese cultural heritage.

It will encourage the public to experience the ancient Chinese bronze mirror rubbing art. The traditional art of rubbing has been included in the list of representative items of intangible cultural heritage. The inheritors of the art use the most traditional Chinese writing tools - rice paper and ink - to record the thousands of years of civilization and art of the Chinese nation. They also use various methods to show the public this ancient traditional art, and promote the art of Chinese bronze mirror rubbing into modern life. It allows more young and middle-aged people to cultivate their character, relax their hearts, and feel the traditional Chinese art in their busy and stressful lives, and promote the development of the cultural and creative industry in Datong City, Shanxi Province, China.

## 1.6 SCOPE OF RESEARCH

### 1) Time Scope

Decorative patterns on bronze mirrors from the Song, Liao, and Jin dynasties in China.

Song Dynasty: 960-1279.

Liao Dynasty: 907-1125.

Jin Dynasty: 1115-1234.



Figure 1 *Timeline of China's Song, Liao and Jin Dynasties.*

Note. Author, 2024

Song, Liao and Jin are the collective names for the Song, Liao and Jin dynasties in Chinese history. This period was a period of multi-ethnic competition, and the three dynasties were established by different ethnic groups. For example, the Song Dynasty was ruled by the Han people, the Liao Dynasty was ruled by the Khitan people, and the Jin Dynasty was ruled by the Jurchen people. During this historical period, China was never controlled by a unified regime.

### 2) Geographical Scope

The main location of this study is the bronze mirrors unearthed and collected locally in Datong City, Shanxi Province, China.

The period I chose in the local culture of Datong City, Shanxi Province, China is a glorious period in local history. In Chinese history, there is a unique phenomenon that a dynasty has several secondary capitals in addition to the capital. Datong was the secondary capital during the Liao and Jin Dynasties. Due to its geographical location, it was responsible for the country's military defense. During this period, Datong City had a large population, convenient transportation, a high level of economic and cultural development, and very developed culture and art.



Figure 2 The location of Datong in the map of Song, Liao and Jin Dynasties.

Note. Author, 2024

### 3) Population range

The research population of this study involves the local population of Datong City, Shanxi Province, China, including young people, students, teachers, collectors, staff of Datong Liao, Jin and Yuan Culture and Art Museum, and tourists.

## 1.7 RESEARCH METHODS

The research method of this study is mixed research, which includes both quantitative research methods and qualitative research methods. The summary is as follows:

### 1) Literature Analysis

Through the analysis and research of documents, historical data on the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China are collected.

The cultural connotation and meaning of the decorative patterns of bronze mirrors of various categories in the Song, Liao and Jin dynasties are analyzed by iconography.

Combined with the comparative research method, the characteristics and value of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties are compared and analyzed.

The research results of the existing unearthed bronze mirror cultural relics and historical documents in Datong City, Shanxi Province are integrated.

### 2) Field Observation

Field observation is one of the important research methods for this research topic. By observing the real appearance of the decorative patterns of ancient Chinese bronze

mirrors in Datong Liao, Jin and Yuan Culture and Art Museum and Datong City Museum, it is more intuitive than the pictures in books and on the Internet.

Using unstructured observation, that is, open observation, a large amount of information can be collected, including rich photos, videos, recordings, pictures, and the information can be screened according to the purpose of the research and observed in a natural situation. Establish the foundation for this research.

### 3) Questionnaire Survey

Design a structured questionnaire to collect quantitative data from different audiences, including the general public, students, teachers, collectors, museum staff, and tourists.

Collect the public's knowledge of the decorative patterns of bronze mirrors in the Song, Liao, and Jin dynasties, including data on interest and opinions.

Analyze the answers to the questionnaire to determine the research trend, the selection of representative patterns, and the public's overall cognition.

The carriers of the questionnaire survey are divided into paper questionnaires and electronic network questionnaires.

### 4) Comparative Research

The researchers will compare and analyze the similarities or differences between the selected traditional bronze mirror decorative patterns and the innovatively designed new bronze mirror decorative patterns, study and judge the similarities and differences in their styles, characteristics, and cultural connotations, and explore general and special laws.

According to the difference in time, horizontal and vertical comparisons are carried out. By comparing the decorative patterns of bronze mirrors in the three different historical stages of Song, Liao and Jin, we can understand the laws of changes in bronze mirror decorative patterns, see the stages and trends of the development of bronze mirror decorative patterns, better understand the past and grasp the future, and carry out modern innovative design.

According to the direction of the goal, we will compare similarities and differences. Analyzing and comparing the structural elements of bronze mirror decorative patterns, summarizing and generalizing the similarities of different bronze mirror decorative patterns will help researchers select the most representative bronze mirror patterns.

### 5) Expert Consultation

Expert consultation is a research method that obtains in-depth and authoritative information through face-to-face or online communication with experts in art design related fields. This method is mainly used to supplement the deficiencies of literature research, deeply explore the professional knowledge, practical experience and unique perspectives in this research field, and provide high-quality first-hand information for research.

Expert consultation can provide professional insights and suggestions, which helps to make up for the limitations of literature research. This study will combine the

opinions of multiple experts for cross-validation to improve the objectivity and credibility of the research.

## 1.8 RESEARCH FRAMEWORK

This research attempts to explore the innovative design and inheritance of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China from multiple perspectives. The research method used combines qualitative and quantitative methods to ensure a strong and comprehensive analysis of this topic. The following is an overview of the structure and content of the five chapters that make up this research:

### Chapter 1

The introduction provides the basic elements involved in this research and gives a comprehensive overview. It introduces the research background, research problem statement, research objectives, research significance, research scope, research methods, keywords and definitions, and emphasizes the importance of this study on the inheritance and innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China.

### Chapter 2

Chapter 2 is the literature review part. Based on rich literature materials, it deeply discusses the historical background, time background, development trajectory, social background, historical heritage, value analysis, cultural value, design value of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China, the content and category, composition and form, meaning and importance of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties unearthed in Datong City, Shanxi Province, China, the characteristic analysis of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, the religious and philosophical concepts contained, historical status and influence, etc.

This chapter has rich visual effects, including the image presentation of representative bronze mirror decorative patterns unearthed and collected in Datong City during the Song, Liao and Jin dynasties, the sorting out of analytical charts and the analysis of their applications in various representative fields of modern art design.

### Chapter 3

Chapter 3 is the research method, which describes in detail the specific content and process of the research method in Chapter 1.

This chapter explains the tools used, observation methods, screening methods, collection of quantitative data, analysis and research and design trends in the study of bronze mirror decorative patterns, and studies the design methods and processes of bronze mirror decorative patterns in this period.

In addition, this chapter also analyzes the methods and theories of innovative design to lay a solid foundation for practice.

In order to improve clarity and facilitate understanding, this chapter will provide more pictures and visual charts, which play an important role in the research, which is

conducive to more intuitive analysis of data and sorting out the context of research and design.

#### Chapter 4

This chapter is a comprehensive exploration of the research results. It focuses on the extraction and drawing process of inspiration and patterns, and presents the design results of innovative patterns. It organizes the relevant data from the questionnaire survey, analyzes the results of field observations, and sorts out and analyzes expert opinions and feedback, emphasizing the research significance of bronze mirror decorative patterns in the Song, Liao and Jin dynasties. Finally, the data and content are comprehensively organized and summarized through exhibition activities.

#### Chapter 5

Chapter 5 Conclusion summarizes these key findings, summarizes the essence of the research results, and corresponds to the research objectives, emphasizing how to achieve these goals through the systematic pursuit of new knowledge and implementation of design results.

Based on the results, continue to provide new research suggestions for this study, envision the market application of the research results, and provide new design ideas and basis for modern designers. These suggestions include how to promote the inheritance of culture and art in Datong City, Shanxi Province, China, and how to innovate modern design.

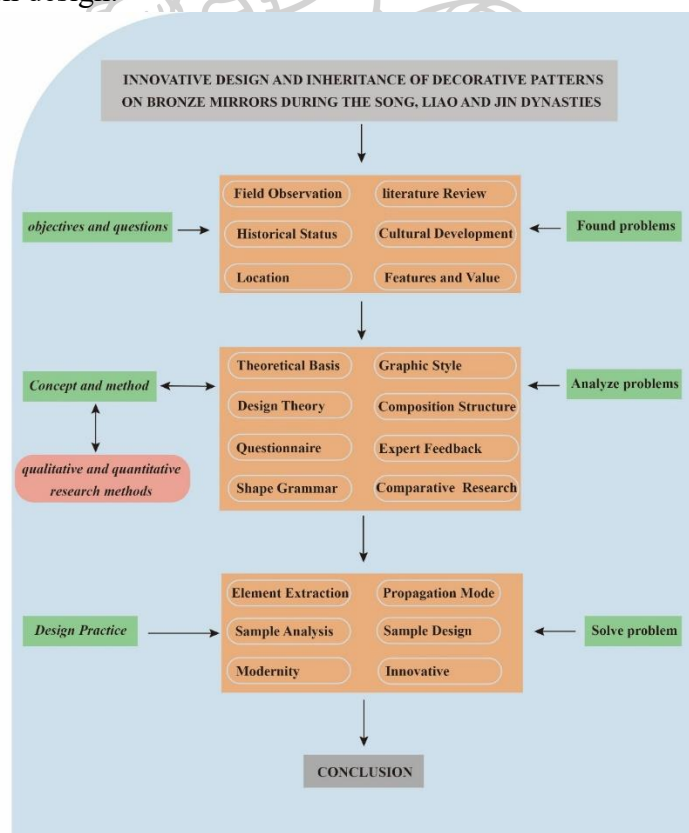


Figure 3 Research Framework Diagram

Note. Author, 2023

## 1.9 DEFINITION

**Decorative Patterns:** Decoration refers to adding patterns and colors to the surface of an object to achieve the purpose of beautification. Pattern is interpreted as the general term for decorative patterns on objects. So, in a narrow sense, decorative patterns are patterns used to decorate the surface of objects. In a broad sense, decorative patterns can be considered as patterns used to decorate the surface of objects, clothing, buildings, etc., including flat and three-dimensional patterns, which are subordinate to the main body of their decoration, and at the same time have independent aesthetic factors parallel to the main body of the decoration. Decorative patterns have a great connection with art in their development process.



Figure 4 *Decorative patterns on bronze mirrors*  
 Note. China Guardian, 2024

**Bronze Mirror:** Bronze mirror is a daily necessity made of copper, with a bright front and exquisitely carved patterns on the back. During the Song and Liao dynasties, bronze mirrors broke through the traditional round and square forms and began to develop in a diversified and multi-form direction. A large number of mirrors with handles and diamond-shaped mirrors appeared. In the Jin Dynasty, the mirror with double fish pattern was the most typical, and the inscribed mirrors were mainly inscribed with poems and essays. The bronze mirrors of this period were carved with vivid and delicate techniques, rich in patterns and content, ingeniously conceived, and all-encompassing (Cammann, 1955).



Figure 5 *Bronze Mirror*  
 Note. Author, 2023

**Song, Liao and Jin Period in China:** The Song, Liao and Jin Period (907-1279) was an important stage in the transition from the Middle Ages to the modern times in Chinese feudal society. The decorative pattern art during this period played a role of inheriting the past and ushering in the future, and has an important historical position.

**Datong:** Located in Datong City, Shanxi Province, China, it was formerly known as “Pingcheng” and “Yunzhong”. It is one of the first batch of national historical and cultural cities and one of the nine ancient capitals of China. It was once the capital of the Northern Wei Dynasty, the secondary capital “Xijing” during the Liao and Jin dynasties, and an important military town in the Nine Frontiers of the Ming and Qing Dynasties. It is known as the “Wei Capital”, “Coal Capital” and “Phoenix City”.

**Rubbing:** This is an ancient printing technique invented during the reign of Emperor Ling of the Eastern Han Dynasty. Rubbing is a handmade reproduction of a carved or stone surface by placing a piece of paper tightly over the object and rubbing it with black or colored material. Traditional rubbing materials are rice paper and a block of black material called rubbing wax. Rubbing is widely used to reproduce decorative patterns and reliefs from various cultural eras; to reproduce stone carvings, especially those from ancient China and other Asian cultures; and artists also use rubbing technology as a creative process, coloring the rubbings and adding or changing the original lines.

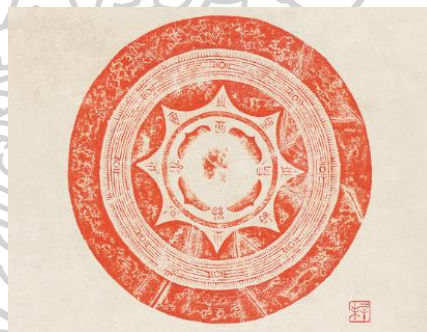


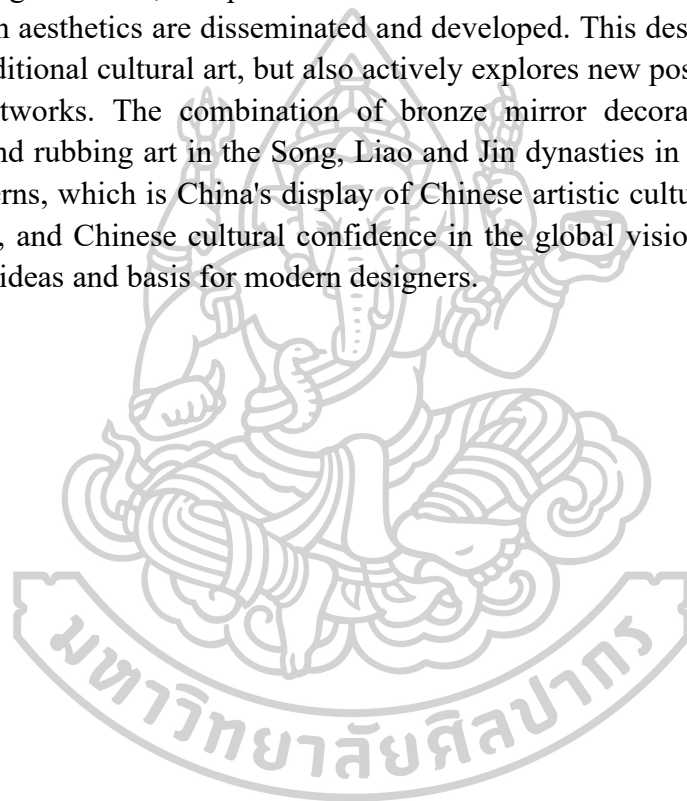
Figure 6 *Bronze Mirror Rubbing*  
 Note. China Guardian, 2024



Figure 7 *Rubbing Technique*  
 Note. Baotu.com, 2024

## 1.10 CONCLUSION

This research explores the inheritance and innovative design of bronze mirror decorative patterns from the Song, Liao, and Jin dynasties in China, reflecting both the preservation of traditional national culture and the advancement of modern innovative design. Based on the historical background of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China, the design method of shape grammar is used to innovatively design bronze mirror decorative patterns, combined with graphic thinking for analysis and research, and interactive experience activities between design products and the public are carried out in the form of rubbing art. While getting feedback, the patterns that combine traditional bronze mirror culture with modern aesthetics are disseminated and developed. This design concept not only respects traditional cultural art, but also actively explores new possibilities for modern aesthetic artworks. The combination of bronze mirror decorative patterns, shape grammar, and rubbing art in the Song, Liao and Jin dynasties in China produces new design patterns, which is China's display of Chinese artistic culture, Chinese spiritual connotation, and Chinese cultural confidence in the global vision, and also provides new design ideas and basis for modern designers.



## **CHAPTER 2**

### **LITERATURE REVIEW**

Bronze mirrors are daily necessities in ancient China. In ancient China, they were used for judging appearance and warding off evil spirits, and they were also used for decoration. Because they have been passed down for more than two thousand years, they have an important position in the history of material culture. The design research on bronze mirror decorative patterns is not only focused on the modern design methods of bronze mirrors, but also on the historical background, value, characteristics of bronze mirror decorative patterns, and the traditional Chinese cultural spirit and ideological connotations contained in religious and philosophical concepts. The literature review in this chapter mainly includes the following 9 parts:

- 2.1 Bronze mirror culture in the Song, Liao and Jin dynasties in China
- 2.2 Value analysis of bronze mirrors in the Song, Liao and Jin dynasties in China
- 2.3 Religious philosophy and function in bronze mirror decorative patterns
- 2.4 Bronze mirror decorative patterns unearthed in Datong City during the Song, Liao and Jin dynasties
- 2.5 Characteristics of bronze mirror decorative patterns during the Song, Liao and Jin dynasties
- 2.6 The Historical Status and Influence of Decorative Patterns on Bronze Mirrors of Song, Liao and Jin Dynasties
- 2.7 Analysis on the current application status of bronze mirror decorative patterns in the field of modern art design
- 2.8 Theory and related research
- 2.9 Conclusion of literature review

#### **2.1 BRONZE MIRROR CULTURE IN THE SONG, LIAO AND JIN DYNASTIES IN CHINA**

##### **2.1.1 INTRODUCTION TO THE SONG, LIAO AND JIN DYNASTIES IN ANCIENT CHINA**

From the 10th to the 13th century AD, Liao, Song, Western Xia, Jin, and Dali existed side by side in today's China. This was actually a period of division in Chinese history (Table 1).

Table 1 *Timeline of Chinese dynasties from the 10th to the 13th century AD*

No.	Dynastie	Period	Century
1	Northern Song Dynasty	960-1127	10th-12th century
2	Southern Song Dynasty	1127-1279	12th-13th century
3	Liao Dynasty	907-1125	10th-12th century
4	Dali Kingdom	937-1254	10th-13th century
5	Western Xia	1032-1227	11th-13th century
6	Jin dynasty	1115-1234	12th-13th century

*Note.* Author, 2023

The Song, Liao and Jin Dynasties (907-1279) was an important stage in the transition from the Middle Ages to the modern times in Chinese feudal society. The decorative pattern art during this period played a role of inheriting the past and ushering in the future, and has an important historical position.

The Liao Dynasty is a unique dynasty in Chinese history. It was founded by the Khitan people and its name is called "Liao" in Chinese. During the heyday of the Liao Dynasty, its rule included today's Northeast China, Inner Mongolia, Outer Mongolia, North China, and northeastern Xinjiang. The politics and system of the Liao Dynasty combined the characteristics of nomadic and agricultural peoples. Although the Khitan people learned the civilization of the Han people, they also retained their nomadic customs for a long time.

The Liao Dynasty established five capitals, namely:

- 1) Shangjing Linhuang Prefecture: located in Nanboro City, Balin Left Banner, Inner Mongolia today.
- 2) Dongjing Liaoyang Prefecture: located in Liaoyang City, Liaoning today.
- 3) Zhongjing Dading Prefecture: located in Daming City, southwest of Ningcheng County, Inner Mongolia today.
- 4) Nanjing Xijin Prefecture: located in Beijing today.
- 5) Xijing Datong Prefecture: located in Datong City, Shanxi today.

The establishment of these capitals reflects the Liao Dynasty's extensive geographical and cultural influence and diversity.

The Liao Dynasty and the Jin Dynasty successively became the first military power in East Asia, and the Western Liao Dynasty also dominated Central Asia. The Song Dynasty became the most advanced country in the world in terms of economy and culture at that time. The ruling area of the Northern Song Dynasty included most of today's North China, extending to Lanzhou and Sichuan in the west and to the south in the south. During the Southern Song Dynasty, due to the loss of about one-third of the land, the control area was reduced to the south of the line from Dasan Pass in the south of Baoji to the Huai River today(Nian, 2022).

The establishment of the Song Dynasty coincided with the division of the Five Dynasties and Ten Kingdoms. With the efforts of Zhou Shizong, an opportunity for reunification appeared in the Central Plains. In 960 AD, the military general Zhao

Kuangyin launched a mutiny, seized power, and established the Song Dynasty. He was later honored as Song Taizu. This new dynasty was called the Northern Song Dynasty. The capital of the Northern Song Dynasty was located in Kaifeng Prefecture, Tokyo, now Kaifeng City, Henan Province. The Northern Song Dynasty gradually eliminated the separatist regimes in various places and completed the reunification of most of the Han-inhabited areas from the Central Plains to the south.

The Jin Dynasty was a multi-ethnic country, in which the Jurchens always occupied a dominant position. Unlike the Liao Dynasty, the Jin Dynasty retained some characteristics of the tribal alliance of early primitive society in its political system. The Jin Dynasty valued officials, whose status was much higher than that of the Song Dynasty, and used them to exclude the literati, which became a major feature of the political life of the Jin Dynasty. After replacing the Liao Dynasty, the Jin Dynasty inherited some border issues of the Liao Dynasty, but its control over the Mobei region was significantly weakened. Finally, the Jin Dynasty perished in 1234 AD.

### 2.1.2 DEVELOPMENT STATUS OF BRONZE MIRRORS

The development history of Chinese bronze mirrors can be traced back to the Qijia culture in the Hexi Corridor about 4,000 years ago (Shulga, 2022). Bronze mirrors in the Central Plains first appeared in the Shang Dynasty and were mainly used for facial reflection and decoration (Zhao, 2009). Generally speaking, the development of ancient Chinese bronze mirrors can be divided into the following seven stages, and the bronze mirrors in each stage have unique artistic styles:

#### 1) Bronze mirrors from the Shang and Zhou dynasties

The bronze mirrors of the Shang Dynasty were all round, with a nearly flat or slightly convex mirror surface, a thin mirror body, and an arched bow-shaped button in the center of the back. The bronze mirrors of the Western Zhou Dynasty were also round, with a flat or slightly convex mirror surface, a thin mirror body, and the shape of the mirror button varied, including bow-shaped, semi-circular, rectangular, and other types.

The decorative patterns of bronze mirrors in the Western Zhou Dynasty can be divided into three categories: plain mirrors, double-ring mirrors, and mirrors with bird and animal patterns (Figure 8). In the early Western Zhou Dynasty, bronze mirrors were mainly plain mirrors; in the middle Western Zhou Dynasty, bronze mirrors with patterns began to appear; in the late Western Zhou Dynasty, the patterns on the back of the mirror were further enriched, and animal patterns appeared, breaking the previous traditional style.



Figure 8 *Bronze mirror with bird and animal patterns*

*Note.* Collection of National Museum of China, 2023

## 2) Bronze mirrors from the Spring and Autumn Period

The Spring and Autumn Period was an important stage in the development history of ancient Chinese bronze mirrors. During this period, bronze mirrors gradually matured from immaturity, which was a key transitional stage. At the same time, the casting center of bronze mirrors began to move from the north to the south. Both the casting technology and the casting quantity of bronze mirrors were significantly improved, far exceeding the previous level.

The style of bronze mirrors in the Spring and Autumn Period inherited the tradition of bronze mirrors in the Western Zhou Dynasty, and at the same time, it also had many important developments. In terms of inheritance, bronze mirrors in the Spring and Autumn Period were still mainly plain mirrors, and the shapes of mirror knobs were diversified and there was no fixed form. However, bronze mirrors in the Spring and Autumn Period also made breakthroughs in many aspects: first, it broke the limitation that bronze mirrors were only round, and square mirrors began to appear; second, the early bronze mirrors were mainly decorated with positive lines, and the composition was simple, while the bronze mirrors in the Spring and Autumn Period cast complex openwork patterns. From the perspective of the expression of the patterns, the artistic style of bronze mirrors in the Spring and Autumn Period has caught up with the development of bronze ware, and its decorative content is more characteristic of the times. These innovations laid the foundation for the further development of bronze mirrors in the Warring States Period.

During the period from the middle and late Spring and Autumn Period to the early Warring States Period, the types of bronze mirrors mainly include the following categories: plain mirrors (all plain mirrors, single-circle convex string plain mirrors, double-circle convex string plain mirrors), pure ground pattern mirrors (no inscriptions), flower and leaf mirrors, four-mountain mirrors (Figure 9), and multi-button mirrors. Most bronze mirrors are round, and some square mirrors also appear. The mirror body is usually thin, with edges, and the overall shape is regular, giving people a light and elegant feeling.



Figure 9 *Four-Mountain Mirror*

*Note. Great National Treasures of China: Masterworks in the National Palace Museum, 2024*

The mirror knobs of this period are mainly bow-shaped knobs, but the top of the knob is usually decorated with 1 to 3 convex string patterns, so it is also called "string pattern knob". The mirror decoration is finely carved, and the pattern often has ground patterns, which makes it more delicate and varied.

In the middle of the Warring States period, the types of bronze mirrors became more diverse, and the decorative styles also changed significantly. For example, the leaf pattern mirrors in the flower leaf mirror developed from simple three-leaf and four-leaf patterns to more complex eight-leaf patterns, and new styles of flower leaf mirrors also appeared. The "mountain" pattern of the four-mountain mirror became thinner from thick and short, and petal patterns, long leaf patterns and rope patterns were added between the "mountain" characters, making the pattern appear quite complicated (Museum, 1983). In addition, five-mountain mirrors and six-mountain mirrors also appeared. New bronze mirror patterns that appeared during this period also included diamond mirrors, animal pattern mirrors, pan-chi mirrors, continuous arc mirrors, gold and silver inlaid mirrors and painted mirrors.

By the late Warring States period to the Qin Dynasty, the decorative style of bronze mirrors further developed, and four-leaf pan-chi mirrors and Mirror with coiled dragon pattern appeared (Figure 10). These rich and diverse patterns and categories reflect the high level of development of bronze mirror art and craftsmanship at that time.



Figure 10 *Mirror with coiled dragon pattern*

*Note.* Collection of National Museum of China, 2023

### 3) Han Dynasty Bronze Mirror

In addition to continuing to use the bronze mirror styles of the Warring States Period, the Han Dynasty also saw the emergence of a variety of popular bronze mirror types, mainly including: Pan Chi pattern mirror, Pan Hu pattern mirror, Zhang Cao pattern mirror, Xingyun mirror, Yunlei Lian Arc pattern mirror, Four Gods Rule mirror (Figure 11), Re-row mythical beast mirror, Lian Arc pattern inscription mirror, Double Circle inscription mirror, Four-breasted animal pattern mirror, Multi-breasted animal pattern mirror, Deformed four-leaf mirror, Mystical beast mirror, Portrait mirror, Dragon and Tiger pattern mirror, Sunlight Lian Arc mirror, Four-breasted God mirror, and Seven-breasted Four-god animal pattern mirror(Sun, 2024).



Figure 11 *Four Gods Rule Mirror*

*Note.* Collection of Datong Museum, 2023

The characteristics of Han Dynasty bronze mirrors are round, thin, flat edge, round button, and stylized decoration, reflecting the high development of bronze mirror technology at that time. The Han Dynasty was an important period in the development of Chinese bronze mirrors. A large number of bronze mirrors were unearthed and they were widely used. The number of bronze mirrors in the Han Dynasty not only far exceeded that of the Warring States Period, but also had significant development in production form and artistic expression. From the development trend of bronze mirrors, the Han Dynasty can be roughly divided into three important stages: the period of Emperor Wu of Han, the period of Wang Mang in the late Western Han Dynasty, and the middle period of the Eastern Han Dynasty. The changes in these periods marked the continuous innovation and evolution of bronze mirrors in craftsmanship and artistic style.

Table 2 *Development stages and characteristics of decorative patterns on bronze mirrors in the Han Dynasty*

Development Stages	Time Period	Shape and Characteristic	Common Type	Decorate
The first stage of development	Early, middle and late Western Han	Carved with flat techniques, with a smooth mirror	Flat-carved bronze mirror, Panchi pattern mirror, nebula	Coiled dragon pattern, nebula

	Dynasty	surface, simple patterns and simple mirror edge design	pattern mirror, grass leaf mirror, daylight mirror, Zhaoming mirror	pattern, grass leaf pattern
The second stage of development	Late Western Han Dynasty to Early Eastern Han Dynasty	The mirror surface is finely decorated and the pattern design is neat	Rule Mirror, Rule Four Gods Mirror	TLV pattern, four gods pattern
The third stage of development	Middle to late Eastern Han Dynasty	The mirror surface is slightly convex, the mirror button is thick, the layout is simplified, and the relief production	Double Kui pattern mirror, bat pattern mirror, portrait mirror, mythical animal mirror, character legend story mirror, stage mirror	Continuous arc patterns, mythical animal patterns, auspicious relief patterns

Note. Author, 2023

4) Bronze mirrors from the three Kingdoms, Jin, Northern and Southern dynasties

According to the bronze mirror data unearthed by archaeological excavations, the types of bronze mirrors during this period mainly include the following popular styles:

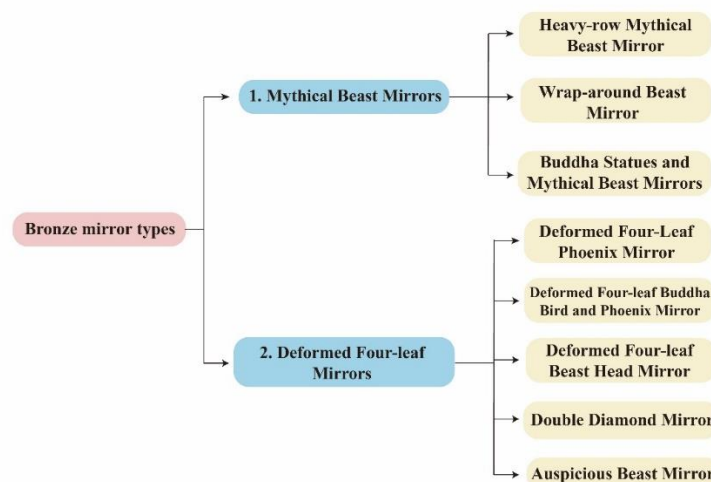


Figure 12 Popular types of bronze mirrors during the three Kingdoms, Jin, Northern and Southern dynasties

Note. Author, 2023

During this period, the decorative themes of bronze mirrors were mainly a combination of four mythical beasts: Azure Dragon, White Tiger, Vermillion Bird, and Black Tortoise. Although some bronze mirrors with inscriptions were discovered in archaeology, very few inscriptions can be clearly identified because the inscriptions are difficult to recognize. Among them, Wu mirrors have the most chronological inscriptions, including “Jianxing”, “Wufeng”, “Taiping”, “Shui'an”, “Ganlu”, “Fenghuang” and other reign titles during the Sun Wu period. There were fewer types of new bronze mirrors during the Three Kingdoms, the Jin Dynasty, and the Southern and Northern Dynasties, mainly following the style of bronze mirrors in the Han Dynasty.

Overall, there were not many types of bronze mirrors in this period, the types were concentrated, and there were few innovations. The most widely circulated were the mythical beast mirrors. Among the deformed four-leaf pattern mirrors, the deformed four-leaf mirror with phoenix pattern is the most common one (Figure 13). From the development history of bronze mirrors, this period was in a stage of stagnation and decline.



Figure 13 *The deformed four-leaf mirror with phoenix pattern*  
 Note. Collection of National Museum of China, 2023

##### 5) Bronze mirror from the Sui, Tang and Five Dynasties

The Tang Dynasty was an important period in the history of the development of Chinese bronze mirrors. The bronze mirrors of the Sui and Tang Dynasties had significant development and innovation compared with the previous generations, mainly in terms of materials, shapes, patterns and artistic styles (Zhang et al., 2024).

In terms of materials, the bronze mirrors of the Sui and Tang Dynasties added tin content to the copper alloy, making the texture of the bronze mirror silverer and brighter, not only beautiful but also practical.

In terms of shape and patterns, in addition to the circular and square shapes of the previous generations, the bronze mirrors of the Sui and Tang Dynasties also innovated diamond-shaped and bronze mirror with auspicious beast and grape pattern (Figure 14). In addition, the patterns of bronze mirrors began to reflect people's ideal life and the pursuit of auspiciousness and happiness. At the same time, there appeared gold and

silver flat-peeled mirrors and mother-of-pearl mirrors with gorgeous patterns and exquisite craftsmanship. These are all manifestations of the superb artistic level of the prosperous Tang Dynasty, fully demonstrating the characteristics of Tang Dynasty bronze mirrors(Xu, 2010).



Figure 14 *Bronze mirror with auspicious beast and grape pattern*

*Note.* Collection of National Museum of China, 2023

The development of bronze mirrors in the Sui and Tang Dynasties went through three main stages. In the Sui Dynasty and the early Tang Dynasty, the main theme of bronze mirrors was auspicious beasts. Auspicious beast mirrors are an important type of bronze mirrors. They not only inherited the tradition of ancient Chinese bronze mirrors, but also made some innovations. Auspicious beast grape mirrors are the representative of the bronze mirror category in the Tang Dynasty, opening the prelude to the theme of bronze mirrors in the Tang Dynasty(K., 1926). From Emperor Gaozong to Emperor Dezong of the Tang Dynasty, new forms, themes and styles appeared in the decoration of bronze mirrors, which brought bronze mirrors into a splendid era. From Emperor Dezong of the Tang Dynasty to the late Tang Dynasty and the Five Dynasties, bird mirrors, auspicious flower mirrors and coiled dragon mirrors were mainly popular.

A notable feature of bronze mirrors in the Tang Dynasty is the diversification of artistic styles and artistic techniques, showing a strong "prosperous Tang atmosphere". In general, bronze mirrors in the Sui and Tang Dynasties have made significant progress in terms of materials, shapes, patterns and artistic styles, reflecting the high artistic achievements of this period.

#### 6) Bronze mirrors from the Song, Liao and Jin dynasties

Before the Tang Dynasty, Chinese bronze mirrors were mainly round, and square bronze mirrors were extremely rare. In the Song Dynasty, the shape of bronze mirrors was further enriched on the basis of inheriting the traditional round, square, and sunflower shapes. The most common mirror in the Song Dynasty was the

diamond-shaped mirror, especially the eight-sunflower-shaped mirror. Compared with the bronze mirrors in the Tang Dynasty, the edges of the bronze mirrors in the Song Dynasty have changed a bit, and some are relatively straight, forming a hexagonal style. In addition, many new styles such as handle mirrors, rectangular mirrors, heart-shaped mirrors, shield-shaped mirrors, bell-shaped mirrors, and tripod-shaped mirrors appeared in the Song Dynasty.

The decorative themes of bronze mirrors in the Song Dynasty are also very rich, with a large number of patterns such as flowers, birds, beasts, mountains and rivers, small bridges, towers, and character stories, full of a strong breath of life. At the same time, there are also plain mirrors, narrow-edged small-button undecorated mirrors, as well as some immortal and character story mirrors, Bagua mirrors, and other types of bronze mirrors in the Song Dynasty (Yang, 2009).

Judging from the archaeological excavations in recent decades, the shapes and patterns of bronze mirrors in the Liao and Jin dynasties are also very rich. Although many of the bronze mirrors of the Jin Dynasty imitated the craftsmanship of bronze mirrors of the Han, Tang and Song dynasties, there are also some unique patterns. Common bronze mirrors of the Jin Dynasty include double front mirrors, historical figure story mirrors, coiled dragon mirrors, auspicious beast mirrors and auspicious flower mirrors. The patterns of bronze mirrors of the Jin Dynasty have two major characteristics: one is to imitate the patterns of bronze mirrors of the Han, Tang and Song dynasties, and the other is to create new patterns based on the patterns of previous generations. Double fish mirrors and figure story mirrors are more common, especially double fish mirror is the most popular, becoming the characteristics of bronze mirrors of the Jin Dynasty.

Table 3 *Innovation of Bronze Mirror Art in Song, Liao and Jin Dynasties*

Bronze mirror shape	Decoration theme	Features
Round, square, sunflower, diamond, six-sunflower, mirror with handle, rectangular, heart-shaped, shield, bell, tripod	Flowers, plants, birds, animals, mountains and rivers, bridges, towers, gods, gossip, historical figures and stories, dragon mirrors, auspicious animal mirrors, auspicious flower mirrors, double fish mirrors, boy climbing branches mirrors	The bronze mirrors of this period have various shapes and rich decorative themes. They are in great demand among the people and have a strong sense of life. The patterns are diverse and new patterns and decorative themes are innovated



Note. Author, 2023

#### 7) Bronze mirrors after the Yuan and Ming dynasties

During the Yuan and Ming dynasties, the production of bronze mirrors began to decline. In addition to continuing the traditional style, some relatively novel double fish patterns, double dragon patterns, and character story mirrors, such as " Immortal Pavilion Character Mirror " appeared (Figure 15). However, the production of bronze mirrors during this period was relatively rough, and most of them only had inscriptions of the year, but no exquisite decorations.










Figure 15 *Immortal Pavilion Character Mirror*

Note. Collection of National Museum of China, 2023

Especially in the Ming Dynasty, the trend of imitating Han mirrors and Tang mirrors was very popular. Most of the imitation bronze mirrors were based on the TLV Mirror of the Han Dynasty and the auspicious beast grape mirrors of the Tang Dynasty, but these imitations were generally small in size, with blurred patterns, and no longer had the exquisite style of the previous bronze mirrors. Overall, after the Yuan and Ming Dynasties, the craftsmanship and artistic level of bronze mirror production were relatively low, and gradually lost their previous glory.

Table 4 Comparison of the development of bronze mirrors in various historical periods in ancient China

Historical period	Shape	Pattern	Mainstream	Representative pattern pictures
Shang and Zhou Dynasties	Round	Plain mirror, double ring mirror, bird and animal pattern mirror	Mainly plain mirror	
Spring and Autumn Period	Round, Square	Plain mirror, ground pattern mirror, flower and leaf mirror, four mountain mirror, animal pattern mirror, coiled dragon pattern mirror, continuous arc pattern mirror	The types of patterns have developed rapidly, and special craft decorative arts have emerged	
Han Period	Round, Square	Mirrors with coiled dragon patterns, mirrors with grass leaves, mirrors with nebulae, mirrors with rules, mirrors with mythical beasts, mirrors with inscriptions, mirrors with multi-breasted beast patterns, mirrors with deformed four-leaf patterns, mirrors with portraits	The star-shaped cloud mirror and the grass-leaf mirror were popular and were popular for a longtime, from the late Western Han Dynasty to the early Eastern Han Dynasty	
Three Kingdoms, Jin, Northern and Southern Dynasties	Round, Square	Mythical animal mirrors, deformed four-leaf pattern mirrors, inscribed mirrors	The most dated inscriptions were found, and the mythical animal mirrors were most widely circulated at this time	

Sui, Tang and Five Dynasties	Round, Square, Diamond Style	Auspicious animal mirror, auspicious animal grape mirror	The most popular ones are bird mirror, auspicious flowers mirror, dragon mirror	
Song, Liao and Jin Dynasties	Round, Square, Flower shaped, Mirror with handle, heart-shaped, shield-shaped	Character story mirror, plain mirror, coiled dragon mirror, auspicious animal mirror, auspicious flower mirror, double fish mirror	Double fish mirror is the most popular	
Yuan and Ming Dynasties	Round, Square, Diamond Style	TLV Mirror, Auspicious beast and grape mirror, Character Story Mirror	The trend of imitating Han and Tang mirror is very popular	

*Note.* Author, 2024

In the long history of the development of bronze mirrors in China, the bronze mirrors of the Song, Liao and Jin dynasties have an extremely prominent position and have become a key stage that connects the past and the future. The bronze mirrors of this period showed unprecedented diversity in both shape and decoration, and the decorative themes were rich, including flowers, animals, landscapes, towers, character stories, etc., which fully demonstrated the strong breath of life and aesthetic taste. At the same time, there were also bronze mirror patterns with cultural implications, such as immortal figure mirrors and inscription mirrors, which reflected the high attention paid to image narrative and spiritual expression during this period. Although some bronze mirrors continued the traditions of previous generations in terms of craftsmanship, what is more valuable is that they innovated on the basis of absorbing the patterns of previous generations, and developed a variety of new patterns with distinct characteristics of the times, such as double fish mirrors, character story mirrors, coiled dragon mirrors, auspicious beast mirrors, and auspicious flower mirrors. Among them, the double fish pattern mirror was particularly popular and became the most representative bronze mirror form of this period. Therefore, the bronze mirrors of the Song, Liao and Jin dynasties are not only unique in artistic style,

but also reflect the changes in social culture and ideological concepts. They are important nodes that cannot be ignored in the study of the development of ancient bronze mirrors and image culture.

### 2.1.3 SOCIAL BACKGROUND TO THE SONG, LIAO AND JIN DYNASTIES

During the Song, Liao and Jin dynasties, Chinese history showed a complex and changeable situation. The Northern Song Dynasty and the Liao Dynasty stood side by side, while the Jin Dynasty and the Southern Song Dynasty faced each other. Frequent wars caused serious damage to the economy. Copper was in short supply and strictly controlled, and was mainly used to mint coins. Bronze mirrors are irreplaceable as daily necessities. The bronze mirrors of the Song, Liao and Jin dynasties not only reflected the obvious characteristics of the times and unique national styles, but also showed rich political, economic and cultural contents through patterns and inscriptions, which far exceeded their practical value and aesthetic significance of arts and crafts.

During the Song, Liao and Jin Dynasties, social and economic development was rapid, urbanization progressed significantly, industry and commerce prospered, the citizen class grew, and social psychology and aesthetic tastes underwent tremendous changes. As a kind of practical arts and crafts, bronze mirrors became a concentrated reflection of social life, cultural thoughts and aesthetic consciousness at that time. Bronze mirrors take on a new look in expressing folk life, showing unique artistic charm and reflecting the beautiful artistic conception extracted from life. They occupy an important position in the history of Chinese arts and crafts and are worthy of in-depth study.

During the Song, Liao and Jin dynasties, the blending of multiple cultures was particularly significant. Regimes maintain and strengthen various relationships through gift exchanges. These gifts not only follow social and cultural rules, but also reflect cultural interactions and competitions between regimes. The moral concepts embedded in gift exchanges, such as loyalty, filial piety, festival, righteousness, etc., strengthen the connection between cultures and demonstrate rich artistic, economic and political significance. As gifts, artworks from this period became an important part of cultural exchanges, demonstrating the power of cultural export. The charm of Chinese art is that it is deeply rooted in its own cultural tradition, embodies the richness of social reality, and achieves development and innovation through exchanges. The idea of "harmony in diversity" of Chinese civilization emphasizes seeking unity amidst diversity, pursuing harmony amidst differences, and promoting development through exchanges.

## 2.2 VALUE ANALYSIS OF BRONZE MIRRORS IN THE SONG, LIAO AND JIN DYNASTIES IN CHINA

### 2.2.1 AUCTION

Through a comprehensive analysis of the databases of Christie's, Poly Auction, China Guardian auction websites, Jinmao Auction, and Jingxing Linfeng Autumn Auction, I obtained market prices, auction records, and image information on bronze mirrors from the Song, Liao, and Jin dynasties, which are summarized in the following table to provide data support for this study.

Table 5 Auction information of bronze mirrors from the Song, Liao and Jin dynasties

No.	Dynasty	Name	Auction Price	Graphics
1)	Song Dynasty	"The Tang Emperor Visits the Moon Palace" Diamond-shaped Mirror	Transaction price: RMB 414,400 Approximately 2,041,748.80 baht	
2)	Liao Dynasty	Double Dragon Mirror	Transaction price: RMB 5.675 million Approximately 27,166,108.19 baht	
3)	Jin Dynasty	Pisces Mirror	Transaction price: RMB 1.45 million Approximately 6,941,120.15 baht	
4)	Liao Dynasty	Mirror with double phoenix pattern	Transaction price: RMB 4.025 million Approximately 19,267,592.15 baht	

5)	Song Dynasty	"Xu You Chao Fu" Character Story Mirror	Auction price: 400,000-600,000 RMB Approximately 1,914,791.77-2,872, 187.65 Baht	
6)	Song Dynasty	"The Chu people present fish" Character story mirror	Auction price: 220,000-300,000 RMB About 1,053,135.47-1,436, 093.82 baht	
7)	Song/Jin Dynasty	The righteousness is as bright as a mirror, Square	Transaction price: \$32,760 Approximately 1,111,261.87 Baht	
8)	Song Dynasty	"Yi Wei" Crossing the River Diamond-shap ed Mirror	Transaction price: \$11,340 Approximately 384,667.57 baht	

Note. Author, 2024

1) A Song Dynasty bronze mirror auctioned at the Jinmao Auction in the autumn of 2010, named "Tang Wang Visiting the Moon Palace Diamond Flower Mirror", is diamond-shaped and has a round button. The top of the mirror button is decorated with auspicious clouds supporting the sun, and the left and right sides are engraved with astrological patterns. Below the button is a picture of four cranes dancing. The lower center of the mirror depicts an arched bridge with a circular railing. There are many pedestrians on the bridge. A man wearing a tall hat and bowing on the right bank is believed to be Emperor Minghuang of Tang. Behind him are guards holding weapons. There is also a maid holding a banner to welcome him on the bridge. The river is flowing under the bridge, and auspicious clouds are swirling on the right. Chang'e stands at the end of the bridge, and two maids holding banners are beside her. This mirror is exquisitely cast, with smooth decorative lines, delicate character portrayal, and strong relief effect. It has high artistic value.

2) At the 2018 Jingxing Linfeng Autumn Auction, the Liao Dynasty "Double Dragon Mirror" brought a new look to bronze mirror art. The mirror is round in shape, with delicate cloud patterns on the edges. Two dragons dance on both sides of the

button, creating a novel and unique composition. The large round button is simple and undecorated, naturally forming a partition, with two dynamic and distinct dragons facing each other on each side.

The two dragons in the mirror are in an S-shaped posture, coiling and rising, baring their teeth and claws, as if trying to meet each other; the other is in a C-shaped posture, with its head held high and claws waving, as if flying from the sky, full of an intrusive feeling, vividly depicting the moment of the two dragons confronting each other. This expression method has achieved a very high realistic effect, and the details of each dragon are vivid, combining movement and stillness, and are real and natural.

The cloud pattern decoration around the mirror surface is rolled in an orderly manner, like the clouds stirred up by the flying of two dragons, which enhances the visual dynamic effect and shows the superb craftsmanship and unique artistic charm of bronze mirrors in the Song, Liao and Jin dynasties.

3) At the 2010 Autumn Auction of Jinmao, a Jin Dynasty bronze mirror attracted attention with its exquisite “double fish decoration”. This mirror is round, with a round button and a petal-patterned button stand. The main decoration is two rotating carps, which occupy the entire space on the back of the mirror. The decoration is expressed in relief. The two fish open their mouths and puff their fins, with their tails folded up, large scales, and long dorsal fins, showing a posture of shaking their heads and tails, which is very dynamic.

The mirror surface is covered with water ripples, vividly depicting the lively posture of carps foraging and roaming in the water. The decoration is clearly depicted, with a strong sense of relief. The realistic expression technique makes the two carps come alive. The expression of water ripples is flexible and varied. According to the needs of the mirror layout, they are arranged in layers or twists and turns, which vividly expresses the ups and downs of the water. This depiction of water ripples reminds people of the "Twelve Water Paintings" by the Southern Song painter Ma Yuan, which embodies the unique technique of expressing water ripples in Chinese art (Figure 16).



Figure 16 A detail of *Twelve Water Paintings*

Note. [https://www.sohu.com/a/114871566\\_447743](https://www.sohu.com/a/114871566_447743), 2024

The overall appearance of this mirror is majestic and heavy, the image of the two fish is plump, and the relief height is higher than the edge of the mirror, which adds a strong dynamic effect. It is a masterpiece among the two fish mirrors, demonstrating the excellent realistic expression ability and artistic value of the Jin Dynasty bronze mirrors.

4) A double-phoenix mirror from the Liao Dynasty, round in shape with a round button. The main decoration is two phoenixes connected head to tail and surrounding the mirror button, forming a harmonious and beautiful pattern. This mirror was originally owned by Mr. Xu Zhantang, a famous Hong Kong collector. It was finally sold at the auction for 4.025 million yuan, setting a record for the highest price of bronze mirrors in the Song, Liao and Jin dynasties. This transaction price not only reflects its unique artistic value, but also reflects the market's high recognition of Liao Dynasty bronze mirrors.

5) This Song Dynasty bronze mirror is based on a classic story, expressing the Song people's feelings about mountains and rivers in a small space. It is a direct reflection of the peak of Song Dynasty landscape painting. The pattern on the back of the mirror depicts a river flowing gently, with mountains on both sides, a man squatting under a tree washing his ears, and another man leading a cow to teach him, vividly reproducing the legend of Xu You and Chao Fu.

The mirror surface decoration cleverly combines water waves, people and trees, like a beautiful freehand landscape painting, showing the artistic conception of seclusion and transcendence at that time. The decoration is complex and orderly, with delicate carving, showing the superb skills of the court craftsmen. In addition, this bronze mirror is particularly large and solid among the bronze mirrors of the Song Dynasty, and the copper is of fine quality. It is a top-notch work among the bronze mirrors of the Song, Liao and Jin Dynasties.

6) This bronze mirror is called the "Chu People Offering Fish" Character Story Mirror. It has a diameter of 21 cm and weighs 1,096 grams. It is in the shape of a diamond flower and has a round button. The pattern on the back of the mirror extends from the upper left corner to the bottom, with fine and tortuous water ripples. The upper right corner of the mirror button is carved with trees and houses with lush branches and leaves. The pillars and beams are carefully carved, showing exquisite craftsmanship. The distant view depicts steep mountains, and the style is similar to the large axe-cutting technique in Song Dynasty paintings.

On the mirror, there are five people on the boat. The boatmen at the head and tail are rowing their boats, each doing their job. The dynamic and vivid images show the charm of the realistic painting style of the Song Dynasty. A person emerges from the water below the front of the stern, holding a treasure in his hand and offering it to the people on the boat. This scene echoes the Han Dynasty allusion "Chu People Offering Fish". It is a rare work in the theme decoration of bronze mirrors and has great cultural value. The entire bronze mirror is delicately carved and cleverly laid out, integrating

rich historical and cultural elements, providing researchers with valuable material for an in-depth understanding of Song Dynasty art and craftsmanship.

7) Christie's auction house is selling a square bronze mirror from the Song and Jin Dynasties named "Jie Shi Ming Ru Jing". The theme of this bronze mirror is a story mirror with characters. The mirror measures 10.8 cm and has attracted attention for its historical value and exquisite craftsmanship.

8) The Song Dynasty bronze mirror auctioned on Christie's online auction website is called "A Reed Crossing the River Diamond-shaped Mirror" and measures 15.2 cm. The theme of this bronze mirror is a Buddhist legend. "A Reed Crossing the River" is a Buddhist legend related to the eminent monk Bodhidharma during the Northern and Southern Dynasties, reflecting the combination of Buddhist culture and art during this period.

## 2.2.2 ANALYSIS OF THE REASONS FOR HIGH AND LOW PRICES

The auction prices of bronze mirrors in the Song, Liao and Jin dynasties are mainly affected by the following factors:

### **Historical and Cultural Background**

Bronze mirrors from the Song, Liao and Jin dynasties each reflected the cultural and technological characteristics of the time. Bronze mirrors from the Song Dynasty are famous for their exquisite craftsmanship and rich pattern designs, including animals and plants, mythological stories, and Taoist and Buddhist decorations. These elements have affected their artistic value and collection value to a certain extent. Bronze mirrors from the Liao and Jin dynasties often have the cultural characteristics of northern ethnic minorities, reflecting different cultural blends and artistic styles.

### **Craftsmanship and Quality**

The craftsmanship of Song Dynasty bronze mirrors is very fine, with high mirror finish and high clarity of patterns, which will increase their auction prices. However, the craftsmanship of Liao and Jin Dynasty bronze mirrors may be relatively rough, and the decorative styles are also different, which may affect their market value.

### **Preservation Condition**

The preservation condition of bronze mirrors has an important impact on their auction prices. Well-preserved bronze mirrors, especially those with smooth and intact mirror surfaces, clear patterns, and no serious corrosion, will fetch higher prices at auctions. Conversely, bronze mirrors that are severely rusted or obviously damaged will have their value greatly reduced.

### **Rarity**

Rarity has a significant impact on the auction price of bronze mirrors. Rare types of bronze mirrors or unique decorative designs often increase their market value. For example, the "Tang Emperor Visits the Moon Palace" Diamond-shaped Mirror from the Song Dynasty received high prices at auctions because of its rarity (Figure 17). During the Liao and Jin dynasties, due to extremely strict bans on copper, all cast bronze

mirrors had to be inspected and stamped by the government. This resulted in the edges of bronze mirrors from these periods often being engraved with government inspection marks and charges. Because of this, the number of bronze mirrors from the Liao and Jin dynasties is limited and rare, especially those with obvious national characteristics, which are highly favored because of their uniqueness and rarity.



Figure 17 *"Tang Emperor Visits the Moon Palace" Diamond-shaped Mirror*  
 Note. [https://www.sohu.com/a/372170727\\_120091738](https://www.sohu.com/a/372170727_120091738), 2023

### **Archaeological Discoveries and Academic Research**

New archaeological discoveries and related academic research can also affect the auction price of bronze mirrors. If a bronze mirror is proven to be of great historical significance or related to a specific historical event or person, its value will increase accordingly. In addition, new information from archaeological discoveries may change people's understanding of certain bronze mirrors, which in turn affects market demand and prices.

### **Market Demand**

Demand in the auction market is an important influencing factor. If a bronze mirror of a certain period is widely sought after in the market, its auction price will naturally go higher. Market demand is often driven by factors such as collectors' interest, academic attention, and procurement plans of museums and institutions.

In summary, the auction prices of bronze mirrors from the Song, Liao and Jin dynasties are affected by a variety of factors, including historical background, craftsmanship, preservation, rarity, archaeological discoveries and market demand. Each factor may affect the market value of bronze mirrors to varying degrees.

### 2.2.3 CULTURAL VALUE

The development of bronze mirrors in the Song, Liao and Jin Dynasties was revolutionary, and it can be said to be another revolution in the history of bronze mirrors. Like the European Renaissance, it greatly promoted the liberation of human thought. During this period, a large number of masterpieces of humanistic spirit emerged. The world-famous "Mona Lisa Smile" is a product of the Renaissance.

The bronze mirrors of the Song, Liao and Jin dynasties are also the artistic products of the great liberation of thought in the history of Chinese civilization. The bronze mirrors at this time changed from the complicated and luxurious bronze mirrors of the Han and Tang Dynasties, and fully integrated the realistic and lifelike aesthetic attainments of the Song Dynasty. The aesthetic attainments of China's Song Dynasty were 1,000 years ahead of the world. In this way, the significance of the Song and Liao gold and bronze mirrors is self-evident.

The beauty of the Song Dynasty is full of humanistic atmosphere. The Song-style aesthetics reached its peak during the Huizong period of the Song Dynasty. He was never a good emperor, but he was an artistic genius. He himself has high attainments in calligraphy and painting, and he is also keen on collecting gold and stone. His "Xuanhe Bogu Tu" records 839 pieces of bronze ware from the Shang Dynasty to the Tang Dynasty collected by the Song Dynasty royal family, pioneering the recording of bronze mirrors in ancient ware atlases (Figure 18). The same is true for the emperor, not to mention the literati and officials below. The rise of epigraphy, the development of meticulous painting, and the prosperity of the urban economy, coupled with the tendency of realism and secularization, directly or indirectly promoted the development of bronze mirrors in the Song, Liao, and Jin Dynasties.



Figure 18 Part of "Xuanhe Bogu Tu"

Note. [www.gmzm.org](http://www.gmzm.org), 2024

Art historian Cahill praised the beauty of Song Dynasty art in this way: "In their works, nature and art have achieved a perfect balance." The bronze mirrors of the Song, Liao and Jin dynasties inherited this perfect balance, but were more unique.

The decoration of bronze mirrors is also a reflection of a cultural phenomenon. It has forged our national spirit through life and concepts. Mythological stories are part of our culture, reflecting the imagination of the ancients about natural things, providing rich themes for future generations, and the yearning and pursuit of a better life by the ancient working people. The divine culture displayed by bronze mirrors combines people and mythical beasts, myths and history, and with the help of the power of mythical beasts, it shows people's expectations for life and their beautiful prayers for immortality.

Culture is the core and soul of a country and a nation. Traditional decorative patterns inherit the genes of China's excellent traditional culture, are the cornerstone of Chinese culture and an important part of the aesthetics of the Chinese people, and have the role of promoting the prosperity of Chinese culture, demonstrating Chinese cultural confidence, and realizing the self-reliance of Chinese culture. The decoration of bronze mirrors condenses the essence of culture and art, social folk customs and religious beliefs, has important cultural value, and is conducive to the realization of national cultural confidence and national rejuvenation. Modern society is an information-based and diversified society. The bronze mirror decorations of the Song, Liao and Jin dynasties can conform to the trend of the times. With its unique formal beauty and profound cultural heritage, it has become a source of inspiration for contemporary designers, showing a diversified development trend. First, it incorporates the fashion of modern elements, and secondly, it tries the diversity of modern materials and craft expression techniques, injecting the bronze mirror decoration with contemporaneity and new vitality. It appears in various fields of mass life and modern design with a new Chinese decorative posture, and uses the artistic charm of its bronze mirror decoration to show the connotation and cultural confidence of Chinese culture.

#### 2.2.4 DESIGN VALUE

1) From the perspective of the layout of bronze mirror patterns in the Song, Liao and Jin dynasties, there are four types of patterns: Symmetrical, Four-cornered Square, Rotary and Concentric (Figure 19). Due to the size limitations of the bronze mirror itself and the unique pattern, the rich and varied decorative language is arranged in an orderly manner in this small space, which is complex but not chaotic, dense but orderly, and the entire bronze mirror pattern design has integrity and unity. In the design process, contemporary designers not only pay attention to the depiction of small local details, but also pay attention to the overall content and purpose of the design to avoid the details from taking over the main theme.

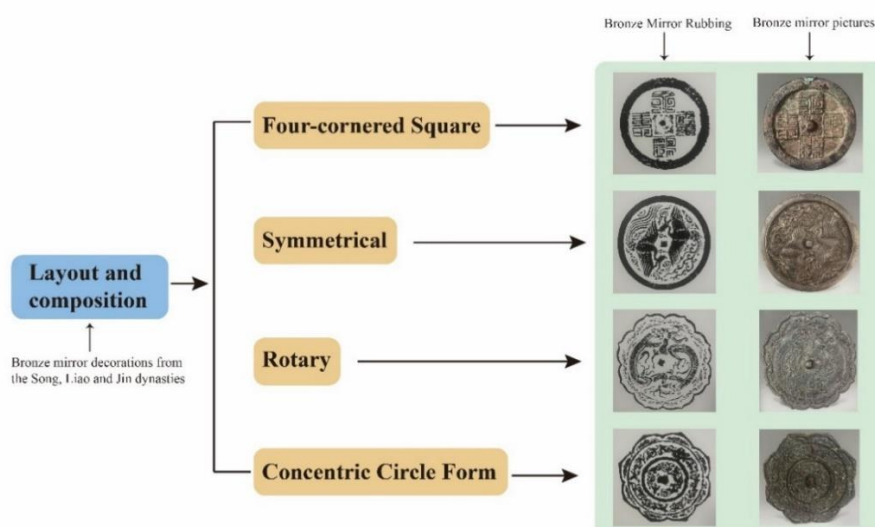


Figure 19 *The layout and composition of the patterns on bronze mirrors from the Song and Liao dynasties*

Note. Author, 2024

2) In the process of learning from bronze mirror patterns, it is inevitable to face the problem of innovation. On the one hand, bronze mirror patterns provide us with rich themes and diverse forms of expression for reference, which does not mean that modern design should blindly copy the original traditional patterns to express national characteristics. Such "innovation" without novelty cannot attract the attention of contemporary people. On the other hand, the positive impact of technological progress on innovation. Bronze mirror patterns have made new innovative adjustments corresponding to the development of technological skills, making it a magnificent chapter in the history of Chinese bronze mirrors. Modern innovative bronze mirror patterns are combined with modern materials and craftsmanship to make innovative adjustments, which will also give new life to traditional patterns.

3) The patterns on bronze mirrors during the Song, Liao and Jin dynasties were rich in themes, depicting many mythological stories, and auspicious beasts and immortal figures that are impossible to appear in real life. Correctly and reasonably adding fun to modern design can increase the affinity of the design work, create a subtle emotional resonance between the user and the user, effectively adjust the living atmosphere, and increase the added value of the design work. As a creative tool, fun has become more and more important with the improvement of human consciousness and civilization.

4) People-oriented. The emergence of bronze mirrors was mainly to facilitate people's lifestyle of looking at each other and worshipping and burying with the dead, and they have practical functions. The emergence of bronze mirror decorations was mainly to meet people's ideological, emotional and aesthetic needs. The artistic beauty of bronze mirrors comes from reality, reflecting the social life and needs of people in ancient China. The wide range of themes and the diversity of layouts reflect the characteristics of designing for people. The bronze mirror decorations integrate the spiritual ideals, personal interests and inner feelings of people in the Song, Liao and Jin dynasties, and are people's self-expression and self-affirmation of society. Modern design must also return to people's real life, respect people's psychological feelings, be based on people's common, overall and fundamental needs and interests, and express human emotions, so that it can be fundamentally based on modern society and accepted by the public.

5) Regarding the understanding of bronze mirrors, as Arnold Hauser said: "The past is essentially meaningless, and its meaning is only obtained from its connection with the present. Therefore, history must be constantly rewritten, and works of art must be constantly reinterpreted." The exquisite and diverse bronze mirrors reflect the superb craftsmanship and casting level of ancient times, and interpret the spiritual culture of China's Song, Liao and Jin dynasties. However, today, people no longer use

bronze mirrors to look at their faces. Only by finding contemporary values that fit today's society can they maintain their long-term vitality and appeal. This has a certain inspiring significance for expanding the field of modern art decoration design, and also has a certain role in promoting the display of the charm of Chinese national culture to the outside world.

## **2.3 RELIGIOUS PHILOSOPHY AND FUNCTION IN BRONZE MIRROR DECORATIVE PATTERNS**

### **2.3.1 FUNCTION OF BRONZE MIRROR**

The function and use of bronze mirrors can be analyzed from the following aspects:

#### **1) Constructing order symbols**

Mr. Lian Chunhai talked about the function of bronze mirrors in the book "Artifact Images and Han Dynasty Beliefs": bronze mirrors have the function of constructing order symbols. "Constructing order symbols" refers to expressing and maintaining a specific social or cultural order through certain objects, symbols or images. In the context of bronze mirrors, this means that bronze mirrors are not only a practical object, but also a symbolic tool used to express and construct a certain order and meaning.

During the Song, Liao and Jin dynasties in ancient China, bronze mirrors were often given specific symbolic meanings, such as representing the sky, the sun, and light. These symbols not only play a decorative and practical role in daily life, but also play a role in specific religious ceremonies, sacrificial activities, tombs and other occasions. For example, placing a bronze mirror in a tomb can symbolize the commemoration and blessing of the tomb owner, or it may mean praying for light, protecting the dead, etc. These symbols and meanings construct a specific cultural order through the existence and use of bronze mirrors, carrying symbols of specific cultural, religious and social significance, and expressing, maintaining and conveying a certain order and value concept through it(Olshin, 2012).

#### **2) Decorative function**

Early bronze mirrors focused on practicality, and did not pay much attention to their decorative function. The Song Dynasty was the period when the decorative appearance of Chinese bronze mirrors was the most diverse. The patterns on bronze mirrors during the Song, Liao and Jin dynasties reflected the decorative function. This decorative function originated from the social trends at the time and was a design that followed the trend. For example: decorative patterns of religious themes and decorative patterns of character stories. Such bronze mirrors may be placed in the home, on women's dressing tables and other daily life as a decoration.

The decorativeness of the bronze mirror patterns reflects the social changes in the Song Dynasty. The cultural and artistic expressions of the upper class will inevitably affect the expressions of the artworks of the lower class, similar to the influence of painting on silk fabrics, porcelain and bronze mirrors. This is a relationship of mutual reference and imitation, reflecting the people's demand for artistic aesthetics during this period.

### 3) Funeral function

In tombs, bronze mirrors are often placed in specific locations as burial objects. These bronze mirrors may be objects used by the tomb owner during his lifetime, and they are buried with him, symbolizing the life and habits of the tomb owner during his lifetime. This type of bronze mirror is not only a daily life tool, but also has certain commemorative and symbolic significance (Schulten, 2005).

The phenomenon of hanging bronze mirrors on the top of tombs is more common in tombs during the Song, Liao and Jin dynasties. This is interpreted by some scholars as a mirror for warding off evil spirits in the tomb chamber, symbolizing the exorcism of evil spirits and avoiding evil. This type of bronze mirror is common in tombs in the northern part of the Central Plains, especially tombs with imitation wooden building structures (Yang, 2021).

Table 6 *Tomb ceiling mirrors and burial bronze mirrors from the Song, Liao and Jin dynasties unearthed in Datong*

No.	Period	Tomb Owner	Bronze Mirror Description and Location	Excavation Information
1	Jin Dynasty	General wealthy households	On the top of the pointed dome of the tomb chamber, a bronze mirror with animal patterns was hung with iron bars, with the inscriptions "The blue cover is made bright and has its own rules. It can ward off misfortune and be suitable for the market. It can keep descendants healthy and beneficial, and make officials live a long life", "Yi Qiu".	Xiguan Village, Pingding, Shanxi, single-chamber tomb
2	Jin Dynasty	Yan Deyuan, an important Taoist master in Xijing area	There are pointed roofs on the four corners, a lotus painting in the middle, and an inscription "Que Xia Lu Xian Guan Zhou Kou" inlaid in the middle. A round plain bronze mirror with a diameter of 32.1 cm; and an oval mirror with a diameter of 10.7 cm, are placed together with daily necessities.	Datong, Shanxi, Tomb of Yan Deyuan of the Jin Dynasty, single-chamber tomb

Note. Author, 2024

#### 4) Daily Use

Although bronze mirrors have different uses in different occasions, their main function is still to "reflect one's appearance", that is, to look at one's face. During the Song, Liao and Jin dynasties, due to the development of furniture and changes in lifestyle, bronze mirrors had a special place in the home, such as being placed on a mirror table, which shows the importance of bronze mirrors in daily life.

The Admonitions of the Court Ladies is a work by Gu Kaizhi, a famous painter in the Eastern Jin Dynasty (Figure 20). The academic community generally believes that the version currently in the British Museum is a copy from the Tang Dynasty. This painting is considered to be one of the earliest dressing pictures. The "Mirror Dressing" part depicts two kneeling women: one woman kneels in front of a bronze mirror with a mirror frame, and a maid beside her combs her hair; the other woman has her back to the picture, holding a bronze mirror to dress, and her face is reflected in the mirror. On the right side of the picture, there is a postscript from the Admonitions of the Court Ladies written by Zhang Hua of the Western Jin Dynasty: "Everyone knows how to cultivate their appearance, but no one knows how to decorate their nature. If one's nature is not decorated, it may violate etiquette and correctness. If one is criticized, one must be able to become a saint." The content of the postscript reveals the core idea of the entire painting and emphasizes the importance of self-cultivation (Bulling & Drew, 1971).



Figure 20 Detail of the Admonitions of Court Instructresses

Note. <https://zh.wikipedia.org>, 2023

The famous scholar Wu Hung believes that through the overlapping "mirror" paintings in the Admonitions of the Court Ladies, women's gaze and reflection on themselves are expressed. The word "mirror" means self-reflection. Li You of the Eastern Han Dynasty once said: "Cast bronze as a mirror to embellish your face. Dress your clothes and dress your hat." Due to the relationship between bronze mirrors and women's appearance, this object spread rapidly at the time and became an important symbol in women's boudoirs.

Wu Hung also pointed out that the composition of "Picture of Female Historian Admonitions" is very unique: one person is facing the front and the other is facing the back, forming what he called the "front and back" composition, reflecting a "mirror" image relationship and creating an interaction between the mirror and the person himself. The inscription of this painting made an obscure reminder of the virtues of women at that time, and this arrangement is closely related to the setting of the inner room space.

In the Song, Liao and Jin Dynasties, a large number of women looking in the mirror appeared in tombs. At the same time, "Biographies of Women" began to be added to the history books of the Song Dynasty, indicating that the female ethical model was changing during this period. With the rise of Neo-Confucianism, social etiquette was constantly transformed, strengthening the constraints of society and family on women's responsibilities and morality, emphasizing "preserving the principles of heaven and eliminating human desires" and suppressing people's natural desires.

The patterns on bronze mirrors during the Song, Liao and Jin dynasties can be roughly divided into two categories: one is a combination of the image themes of the Tang Dynasty, which is more decorative; the other is influenced by painting and has a storytelling and painting style. Therefore, it can be seen that the patterns on bronze mirrors during the Song, Liao and Jin dynasties played a connecting role in handicraft decoration.

Mr. Wu Hung pointed out that bronze mirrors have two sides: one side reflects oneself, and the other side displays patterns, which symbolize the "ideal self" of poets and painters respectively. Perhaps, one side of the bronze mirror pattern is a depiction of the "ideal world" of the person looking in the mirror.

In general, the functions of bronze mirrors in the Song Dynasty are diverse, both practical, decorative and special. These functions are closely related to the patterns, users and usage environment of the bronze mirrors, reflecting the diversity of social culture at that time.

### 2.3.2 BRONZE MIRROR DECORATIVE PATTERNS AND TAOIST CULTURE

Folk customs are often influenced by religion, and religious concepts are often folkized. In a broad sense, religion is a special kind of folk custom. The ideas on the bronze mirror are the product of human thoughts and beliefs. Through the imaging function of the bronze mirror, these ideas are endowed with divine colors.

From the Wei and Jin Dynasties to the Sui and Tang Dynasties, bronze mirrors used their folk customs and religious functions to become important Buddhist and Taoist instruments. From the Han Dynasty to the Wei and Jin Dynasties, the decorative patterns of bronze mirrors carried a lot of Taoist colors. These patterns were widely accepted and adopted under the influence of the mainstream culture at that time. From the Wei and Jin Dynasties to the Southern Song Dynasty, under the influence of religious leaders Ge Hong, Tang Xuanzong and Song Huizong, Taoism used bronze

mirrors as important instruments in religious ceremonies for activities such as refining the body and prolonging life. Therefore, bronze mirrors were covered with a mysterious religious color. During the Song, Liao and Jin Dynasties, Taoism began to infiltrate the people and integrated with local witch temples. This period was also the peak of the localized production of bronze mirrors. The use of bronze mirrors increased significantly, and the Taoist trend of their patterns became more and more obvious.

In Taoism, bronze mirrors have the function of magic tools, which can command ghosts and gods, avoid disasters, call on immortals to pray for blessings, pray for clear weather and rain, etc. Taoism attaches great importance to cultivating immortals and becoming immortal, and emphasizes the magical nature of heaven and magic tools, so the magical functions of bronze mirrors are fully exerted in Taoism(Cahill, 2005).

During the Song, Liao and Jin Dynasties, due to the combination of Taoism and local folk customs, some local witch temples reduced the religious ritual function of bronze mirrors, and gradually magnified the witchcraft folk functions such as revealing monsters and exorcising ghosts. The saying of the magic mirror in the famous novel "Journey to the West" in the Ming Dynasty of China originated from this and has been passed down to this day.

The sword decoration in the bronze mirror decoration is also closely related to Taoist culture. As a magic tool, the bronze mirror itself enhances its magic tool function by combining other magic tool images with folk evil-repelling objects. For example, the sword decoration and bronze tripod elements appear on the Song Dynasty bronze mirrors "Double Sword Inscription Mirror" and "Peach-shaped Double Sword Seven Star Pattern Mirror"(Figure 21). This design not only has the function of warding off evil spirits, but also is related to the symbolic meaning of Taoist alchemy. The biggest feature of Taoism is not the emphasis on the practicality of bronze mirrors, but the fact that mirrors and swords are spiritual objects that can be used according to the surrounding environment and the Taoist's magic power. The sword decoration on the back of the mirror further reflects the spirituality and power of the bronze mirror(Cahill, 1986).

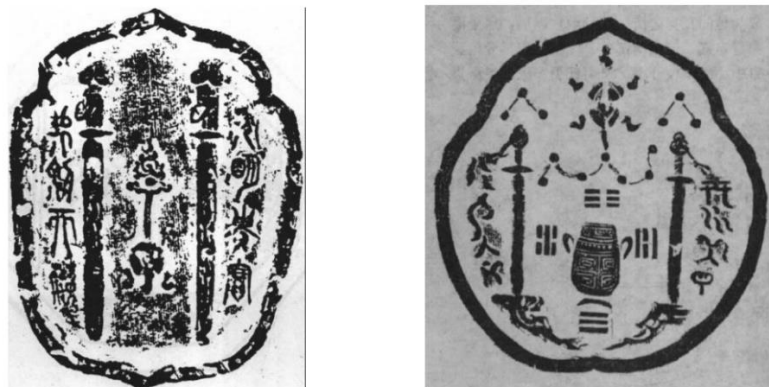


Figure 21 "Double Sword Inscription Mirror" and "Peach-shaped Double Sword Seven Star Pattern Mirror"

Note. Illustrated Dictionary of Chinese Bronze Mirrors, 2023

### 2.3.3 BRONZE MIRROR DECORATIVE PATTERNS AND BUDDHIST CULTURE

Since the Eastern Han Dynasty, Buddhism has gradually merged with Taoism and Confucianism in China, and has formed various forms of interaction with local witchcraft, Taoism and local religions. Buddhism originated in India and focuses on philosophical thinking and inner practice. When Buddhism was introduced to China, it gradually absorbed the use of bronze mirrors by local religions and formed a unique cultural expression. In Buddhist culture, bronze mirrors are used to reflect a person's sins throughout his life. This image of the combination of bronze mirrors and Buddhist culture reflects the role of bronze mirrors in distinguishing good from evil and distinguishing right from wrong.

The relationship between Buddhism and bronze mirrors can be viewed from two aspects: one is practical function, and the other is symbolic meaning. In terms of practical function, bronze mirrors are widely used in Buddhism. Buddhists believe that bronze mirrors are bright and flawless, suitable for reflecting the mind of practitioners during meditation, helping monks to concentrate and practice meditation. In addition, bronze mirrors also occupy an important position in Buddhist statues, and are often placed in the hands of Bodhisattvas or gods as Dharma mirrors, symbolizing the light of wisdom.

From the perspective of spiritual culture, Buddhism often uses bronze mirrors as metaphors to explain the mystery of Buddhism from multiple angles and aspects. For example, a Song Dynasty peach-shaped mirror with a preaching scene has a Buddha statue in the middle, surrounded by monks and worshippers (Figure 22). This image is intended to express the wisdom of Buddhism and the concept of saving all living beings. Wan Yuzhong pointed out in "Song Dynasty Peach-shaped Bronze Mirror Unearthed in Danleng County" that the inscription on this mirror depicts the scene of a Buddhist ceremony, reflecting the richness of Buddhist culture at that time.



Figure 22 *Song Dynasty Peach-Shaped Preaching Picture Bronze Mirror*

*Note.* Illustrated Dictionary of Bronze Mirrors from the Sui Dynasty to the Qing Dynasty, 2023

In addition, the lotus, flying sky, lion, Buddha niche, Bodhi tree, Bodhidharma, Cundi mantra, Capricorn fish and "卍" pattern, which are common in Buddhist images, have greatly enriched the connotation of my country's bronze mirror culture and injected new vitality into it. In the Song, Liao and Jin Dynasties, influenced by Buddhism, bronze mirrors with Arhat themes also became popular, showing a distinct Buddhist color.

In particular, the "卍" pattern mirror mainly followed the Tang Dynasty style in the early Song Dynasty. It usually appeared in a round or square shape, with the mirror button as the center, and the swastika symbol was arranged symmetrically. As an important symbol of Buddhism, the "卍" symbol symbolizes "the gathering of auspicious virtues", indicating auspiciousness and perfection of merit. This symbol is not only of great significance in religion, but also used as a Chinese character, implying auspiciousness and the continuity of all achievements.



Figure 23 Song Dynasty bronze mirror with "卍" pattern  
Note. Datong Museum, 2024

In summary, the combination of Buddhist culture and bronze mirrors not only enriches the functions and forms of expression of bronze mirrors on the material level, but also injects more symbolic meaning into bronze mirror culture on the spiritual level. This combination reflects the complex process of the spread and localization of Buddhist culture in China, and has a profound impact on the development of bronze mirror decorative art.

## 2.4 BRONZE MIRROR DECORATIVE PATTERNS UNEARTHED IN DATONG CITY DURING THE SONG, LIAO AND JIN DYNASTIES

### 2.4.1 CONTENT AND CLASSIFICATION

This section will study the bronze mirrors from the Song, Liao and Jin dynasties collected by Datong Museum, totaling 76 pieces, including 37 bronze mirrors from the

Song Dynasty, 6 bronze mirrors from the Liao Dynasty, and 33 bronze mirrors from the Jin Dynasty. They are classified according to the content into animal, flower and bird, character story and inscription categories. And 30 bronze mirrors with clear and representative decorative patterns were selected for analysis(Kong, 1997).

#### 1) Animal Category

Among the bronze mirrors unearthed in Datong City during the Song, Liao and Jin dynasties, the representative animal-like bronze mirrors include diamond-shaped dragon mirror, single dragon mirror, double phoenix mirror, double dragon mirror, cloud dragon pattern mirror, dragon and tiger mirror, eight-curved cloud dragon pattern mirror, four round and four Chi mirror, and double fish pattern mirror, a total of 9 bronze mirrors.

The decorative pattern of the diamond-shaped dragon bronze mirror is as follows: the back of the mirror has two dragons circling in the same direction, with their heads connected. Both dragons have no horns and four legs, and a circle of rolling cloud patterns is decorated on the outside of the dragon pattern.

The dragon is a symbol of China, the Chinese nation, and Chinese culture. The image of the dragon is a symbol, a mood, and a patriotic emotion. The cultural implication of the dragon in Chinese history is that it symbolizes auspiciousness, strength, and independence. It implies the spiritual qualities of moving forward courageously and unyieldingly. In folk beliefs, the dragon is the patron saint of wind and rain, harvest, and happiness, and it embodies people's yearning and expectation for a better life.

The decorative pattern of the single dragon mirror is as follows: a line on the back of the mirror is coiled around the mirror button and curved over the entire main area, the first and second legs are almost connected, the dragon's mouth is open and the eyes are wide open, and the dragon's whiskers are flying. The dragon god is strong and powerful, with the left front paw stretched forward as if it is flying, one of the hind legs is entangled with the tail, the dragon's mouth is wide open as if swallowing a pearl, and there is a flame-shaped gem in front of the mouth. The scales on the dragon's body are distributed in a diamond-shaped pattern, the dragon's dorsal fin is undulating, and the dragon's body is decorated with cloud patterns.

Cloud patterns symbolize rising step by step and everything going well in Chinese culture. It is a typical traditional pattern in my country and is widely decorated on ancient Han architecture, sculptures, clothing, utensils and various crafts, mostly as a foil pattern.

The decorative pattern of the double phoenix mirror is as follows: two phoenixes are arranged opposite each other, with their heads facing each other up and down, and their wings spread out. The wings and tail feathers stretch along the inner circle. The tail feathers of one phoenix curl to the upper left, with the tail feathers in a pattern of winding flowers and plants. The tail feathers of the other phoenix stretch to the lower right, with four slender and toothed tail feathers curved like water ripples, and the whole body is decorated with auspicious cloud patterns.

In ancient Chinese history, the phoenix symbolizes strong vitality and prosperity. Phrases such as dragon and phoenix bring good luck and phoenix flying are used to symbolize love happiness and harmonious couples. The phoenix is an auspicious bird, and it also symbolizes the beautiful hope of a peaceful and prosperous era.

The decorative pattern of the double dragon mirror is as follows: On the back of the mirror, two dragons surround the mirror button, connected head to tail, with clear depictions of the dragon's head, limbs, dorsal fin, and scales. The dragon's mouth is slightly open, its neck is bent and its head is raised, its horns are erected, its teeth are bared and its claws are waving, its tail is wrapped around a hind limb, and a circle of auspicious clouds is decorated near the edge.

The decorative pattern of the cloud dragon mirror is as follows: The decoration of this bronze mirror adopts the expression technique of high relief. The decoration on the back of the mirror is a dragon pattern that surrounds the mirror button in a "C" shape. The dragon has a strong body, with eyes wide open and mouth open, wanting to swallow the pearl, its body is tumbling and vigorous, its back is obvious, its scales are stacked, its claws are stretched forward, its tail and hind limbs are intertwined, and its body is decorated with relief auspicious clouds.

The decorative pattern of the dragon-tiger mirror is as follows: the mirror button on the back of this bronze mirror is decorated with a dragon and a tiger in high relief on the left and right, facing each other, both roaring, with strong bodies, fine hair and scales, the dragon's mouth is wide open, sharp teeth are exposed, and the tiger's eyes are wide open, looking excited, and the back half of the dragon and tiger are pressed under the mirror button. At the bottom of the mirror button, a deer and a bird are intimate with each other. The main decoration is surrounded by a circle of inscriptions, and a circle of short oblique lines is decorated near the edge.

In Chinese culture, "tiger" and "blessing" are homophonic, so tigers have the meaning of exorcising evil spirits, bringing good luck, and protecting peace. In the hearts of Chinese people, tigers are the patron saint of fertility and wealth, and are mascots on the land of China. They embody people's yearning and pursuit for a better life.

The decorative pattern of the mirror with eight-curved cloud and dragon is as follows: This bronze mirror is in the shape of an eight curved diamond flower. On the back of the mirror, two dragons surround the mirror button, connected head to tail, with their front and rear limbs stretched out and claws exposed. The dragon body is decorated with eight cloud patterns of the same shape. The dragon's dorsal fin, plastron, scales, and fine elbow hair and beard are all carefully depicted.

The decorative pattern of the mirror with four round and four chi is as follows: Several groups of short oblique lines radiate from the mirror button. The four nipples and four gods are distributed alternately between the two short oblique lines on the outside of the button seat. The edge of the bronze mirror is engraved with an inscription: "丰州録事司官千夫".





In ancient Chinese art, the chi pattern is a very special and mysterious design element. "Chi", in the ancient Chinese creation concept, is a kind of exotic beast with infinite transformation, which looks like a dragon but has no horns. The chi pattern commonly seen in the pattern is a vivid and complex image of ancient exotic beasts. Chi is a mighty water god, usually considered a symbol of exorcising evil and avoiding evil and blessing people with peace. Therefore, the appearance of Chiwen is not only a pursuit of beauty, but also a wish for peace, tranquility, safety and success.






The decorative pattern of the bronze mirror with double fish pattern is as follows: the raised string pattern near the edge of the bronze mirror divides the back of the mirror into two areas, the inner and outer areas. The inner area has double fish close to each other, with plump bodies, sideways tails, and the tails folded back toward the mirror button. The background is lined with water ripples. The outer area is a circle of water grass patterns, flowing and swirling (History, 1997).

The meaning of fish in ancient Chinese culture and art is prosperity and longevity. In ancient China, fish were regarded as a precious treasure because they can reproduce and grow. Fish are also widely used in weddings and other occasions, implying the love between husband and wife and the happiness of love.

Fish have always played an important role in cultures around the world. In the ancient Aegean culture, fish is a common decorative pattern, symbolizing harvest and prosperity. In Christian culture, fish is a symbol of Jesus Christ, because Jesus used five fish to preach. In traditional Chinese culture, fish are regarded as a symbol of prosperity, festivity and auspiciousness.

Table 7 *Bronze mirror information table for animal categories*

No.	Name	Dynasty	Meaning	Picture
1	Diamond-shaped Dragon Mirror	Song	Good luck, Everything goes well	
2	Single Dragon Mirror	Song	Strength and independence, Step by step	
3	Double Phoenix Mirror	Song	Auspicious, Beautiful, Peaceful and prosperous times	
4	Double Dragon Mirror	Jin	Keep moving forward and never give up	

5	Cloud Dragon Pattern Mirror	Song	The patron saint of wind, rain, harvest and happiness	
6	Dragon and Tiger Mirror	Song	Blessing, Peace, Wealth	
7	Eight-curved Cloud and Dragon Pattern Mirror	Liao	Yearning and expectation for a better life	
8	Four Round and Four Chi Mirror	Jin	Safe, Peaceful and Smooth	
9	Double Fish Pattern Mirror	Jin	Prosperity, Happiness, Longevity	

*Note.* Author, 2024

## 2) Flower and Bird Category

Among the bronze mirrors unearthed in Datong during the Song, Liao and Jin Dynasties, the representative bronze mirrors with flowers and birds include auspicious beasts and grapes, diamond-shaped mirrors with flowers and birds, mirrors with flowers, mirrors with lotus, mirrors with wild geese flying through flowers, and mirrors with winding branches and flowers, a total of 6 bronze mirrors.

The decorative pattern of the bronze mirror with auspicious beasts and grapes is as follows: the convex pattern around this bronze mirror divides the back of the mirror into two areas, inner and outer. The inner area is embossed with six auspicious beasts and branches. Some of the auspicious beasts in the branches are in a prone position, while others are in a running position. The outer area is wrapped with a flower branch pattern, and auspicious beasts and birds in different forms are surrounded by it. Ruyi cloud pattern is decorated on the edge.

The pattern of grapes and leaves and vines on the ground in the pattern of this bronze mirror implies: long descendants and prosperous family. Since the period of Emperor Wu of the Western Han Dynasty, Zhang Qian went on a diplomatic mission to the Western Regions and opened up the Silk Road. This made grapes, a fruit not native to China, spread from the Western Regions to the Central Plains. Because the branches and leaves of grapes spread out and the fruits are abundant, they are particularly close to

people's wishes for long-lasting offspring and prosperous families, so they have become a popular decorative theme.

The auspicious beast in the decoration is the lion introduced from the Western Regions. In addition to attracting wealth, good luck, and warding off evil spirits, it also has the meaning of guarding the house, good luck, and promoting marriage.

The decorative pattern of the diamond-shaped bronze mirror with flower and bird patterns is as follows: the raised string patterns on the back of the bronze mirror divide the mirror back into three areas, and the inner circle string pattern is higher. Four birds surround the inner and middle areas, and the birds are decorated with twined flower and grass patterns. The edge of the outer area is decorated with cirrus patterns.

The twined flower and grass pattern is one of the traditional patterns in ancient China. Its full name is "twined branch pattern", commonly known as "twined flower", also known as "longevity vine", and is an important decorative pattern in ancient Chinese art. Because of its continuous structure, it also means "endless life", which means auspiciousness. The twined branch pattern has a strong vitality, with many changes and graceful shapes.

The decorative pattern of the bronze mirror with flower patterns is as follows: eight diamond-shaped, a circle of beaded patterns near the edge divides the mirror back into two areas, the inner and outer areas, with the mirror button as the center, a group of broken branches and flower branches are symmetrically distributed in the inner area, the decoration is delicate and beautiful, and there is a group of flower and grass patterns between the beaded patterns and the edge of the mirror. The edge of the mirror is engraved with the official verification mark.

The beaded pattern, also known as the beaded pattern or the circle pattern, is a geometric pattern in traditional Chinese culture. It is composed of a series of circles or spheres connected to each other and arranged in an arc shape. The style of the beaded pattern is mostly circular, representing the sun, and the ring represents the radiation of the sun's brilliance, representing "fire". It is the sun imagined by the ancients and the messenger of light in the consciousness of ancient people.

The decorative pattern of the bronze mirror with lotus patterns is as follows: the mirror button is the pistil, decorated with a lotus, the bottom of the mirror button is a flower branch, and the outer periphery is surrounded by a raised string pattern. It reflects the integration of Buddhist culture.

The lotus pattern means purity, enlightenment, spiritual growth and auspiciousness. As a traditional Chinese auspicious pattern, lotus pattern has rich cultural implications. In folk art, lotus pattern also has the meanings of "lotus gives birth to a son" and "a happy marriage for a hundred years". In Confucian culture, lotus is also regarded as the embodiment of truth, goodness and beauty, representing good fortune and auspiciousness. Modern people also often use lotus pattern to express the wish of having sons.

The decorative pattern of the swan goose through flowers bronze mirror is as follows: the back of this bronze mirror is concave, decorated with winding flowers,







among which flowers bloom, and four cranes are flying between the branches, with a lively image.

The meaning of crane is rich and varied, it symbolizes longevity, happiness, auspiciousness and loyalty. In ancient China, cranes were regarded as a noble and noble bird, with an elegant posture, and were regarded as the most immortal creature among the spiritual birds.

The decorative pattern of the bronze mirror with winding flower pattern is: eight-petal diamond shape, the back of the mirror is covered with broken flower pattern, the main pattern is four groups of blooming flowers, petals blooming, stamens standing upright, the branches of the four groups of flowers are intertwined and intertwined, and the outer side is surrounded by string pattern, the pattern is delicate and beautiful.

The meaning of the flower pattern is: wealth and auspiciousness, happiness and well-being, health and longevity, prosperity and perseverance. It reflects the people's expectation for a better life at that time (Yang, 2010).

Table 8 *Bronze mirror information table for flower and bird category*

No.	Name	Dynasty	Meaning	Picture
1	Mirror with auspicious beast and grape pattern	Song	Long descendants and prosperous family	
2	Diamond-shaped mirror with flower and bird pattern	Song	Continuous, everlasting	
3	Flower pattern mirror	Jin	Life force, sun, light	
4	Lotus pattern mirror	Jin	Purity, auspiciousness, truth, kindness, and beauty	
5	The Wild Goose Passing Through the Flower Mirror	Jin	Longevity, happiness, loyalty	
6	Winding branches and flowers pattern	Jin	Wealth, health, happiness and longevity	

Note. Author, 2024

### 3) Character Story Category

Among the bronze mirrors unearthed in Datong during the Song, Liao and Jin Dynasties, the representative bronze mirrors with stories about people include the mirror with figures viewing waterfalls, the mirror with immortals, turtles and cranes, the mirror with boy and flower branches pattern, character story mirror, the mirror with double fish and mermaids, character story handle mirror, the mirror with the story of Xu You and Chao Fu, the mirror with the story of Wu Niu panting under the moon, and the mirror with immortals and cranes for longevity, a total of 9 bronze mirrors.

The decorative pattern of the bronze mirror with figures viewing waterfalls is as follows: there are two figures on the left side of the mirror button, a woman sitting on the ground with two flowers and plants in front of her, a boy standing behind her holding something in both hands, and a bamboo forest behind the boy. Opposite the figures is a mountain stream, and the river water rolling down from the cliff is surging at the bottom of the bronze mirror, with two lotus flowers blooming in the water. The inscription "尚家" is engraved above the mirror button, and a pair of phoenixes are flying above the inscription, and the outer edge of the pattern is surrounded by raised double lines.

The phoenix pattern and lotus pattern are both typical representatives of traditional Chinese patterns, symbolizing happiness and auspiciousness. The Chinese landscape depicted on this bronze mirror expresses the people's expectations for a better life at that time and reflects the real-life scenes of the ancient Chinese.

The decorative pattern of the Immortal, Turtle and Crane Mirror is as follows: There is a tree on the right side of the mirror button of this bronze mirror, with a thick trunk and branches hanging to the left. Under the tree sits an immortal, wearing a long robe, with a halo on his head and his hands folded. On the left, a waiter is standing on auspicious clouds, facing the mirror button. Bamboo and grass grow under the mirror button, and the crane and the turtle are facing the immortal with their heads held high.

The immortal, the turtle and the crane are scenes depicted in Chinese mythology. They are the ancient people's vision of good wishes in the context of Chinese Taoist culture. The crane has been loved by people since ancient times as a symbol of longevity. When celebrating birthdays, the ancients often used this symbol to wish the birthday star a long life. In the feudal society of my country, people often associated turtles with longevity and beauty. Since ancient times, turtles have been an auspicious animal in our society. Like cranes, turtles are also a symbol of longevity. The decorative pattern of this bronze mirror implies good wishes for longevity and peace.

The decorative pattern of the boy and flower branches is as follows: the back of the mirror is divided into two areas by a circle of beads, and the inner circle is decorated with five flower and leaf patterns with the mirror button as the center. In the outer circle, four boys lie prone and hold broken lotus branches and play among the branches, with bees and butterflies circling around them.

The decorative pattern of the boy playing scene implies that the ancient people hoped for many children and good fortune. The boy playing scene on the picture is lively and lively. The boy runs and jumps among the branches, presenting a happy atmosphere. Bees and butterflies are circling around, symbolizing the beautiful vision of sweetness and unity.

The decorative pattern of the character story mirror is as follows: a bridge is decorated under the mirror button, and the river flows under the bridge. There is a tree on each side, and the branches grow horizontally to the upper part of the bronze mirror. In front of each tree, there is a person holding something in both hands, and a lion with a hydrangea is running between the two people. There is a raised horizontal ridge above the mirror button, on which there is a person holding something in both hands. There is an inscription engraved in a rectangular frame near the edge above the mirror button.

The themes of the mirrors with character stories are rich, including folk stories, myths and legends, historical anecdotes, social life, etc., which shows that people in this period paid more attention to reality, as well as stories and feelings closely related to real life, and the themes of bronze mirror decoration tended to be natural and popular. The decorative pattern of this mirror with character stories includes the element of lion. For China, lions were originally foreign species. With the gradual Sinicization of Indian Buddhism introduced into China in the early Eastern Han Dynasty, a colorful "lion culture" with Chinese characteristics was produced. In Indian Buddhism, lions are called "king of beasts" and guardian beasts, Buddha is called "lion among men", and the solemn Dharma sound of Buddha is called "lion's roar". "Lion's roar" has infinite power to shake the world, pass on for a long time, and sweep away evil. The place where Buddhist monks meditate is also called "Leo Seat". When these sutras were passed to China, they developed and evolved, and the wise Manjusri Bodhisattva rode a majestic blue lion, and the lion became a new auspicious animal alongside the dragon, phoenix, tortoise and unicorn, the four spiritual animals. As for the majestic but not angry lion sculptures, they were displayed on both sides of the imperial tombs, at the gates of palaces, government offices, Buddhist temples and wealthy households, and dotted on the sides of river bridges and roads, playing the role of suppressing evil or decorative. The lion is the embodiment of wisdom and strength, and has the meaning of auspiciousness, prosperity and endless life, and symbolizes status, dignity and peace.

The decorative pattern of the bronze mirror with double fish and mermaid pattern is as follows: the convex string pattern outside the mirror knob divides the mirror back into two areas, the inner and outer areas. The inner area is surrounded by a lotus with the mirror knob as the center, and two boys are playing in it. The outer area is based on water ripples, and mermaids, double fish, sheep, cows, and horses are counterclockwise around it, running and swimming.

In Chinese Taoist culture, Taoism has a natural worship of water, and water is listed as one of the five offerings. This bronze mirror contains elements such as water

ripples and mermaids, which symbolize life and endless supply. The decorative pattern of this bronze mirror is classified as a character story, depicting the myth of mermaids, showing the wisdom and culture of ancient people.

The decorative pattern of the bronze mirror with a handle of character story is as follows: there is a tree on the left side of the mirror back, with lush branches and leaves extending forward. A woman is sitting under the tree, playing a musical instrument, with a pot of orchid in front of her, and two maids are standing in front of them with objects in their hands. The handle is decorated with floral patterns.

The pattern of a tree with lush branches and leaves symbolizes prosperity in ancient China. Orchids symbolize nobleness, virtue, indifference to fame and wealth, simplicity, elegant temperament, sincere friendship, and beautiful talent. The decorative pattern of this handle-type bronze mirror reflects the noble character and beautiful vision of the owner of the bronze mirror.

The decorative pattern of the bronze mirror of the story of Xu You and Chao Fu is as follows: the back of the mirror is divided into two parts, land and water. The upper part of the boundary is generally flat but slightly undulating, and the lower part is a pattern with unequal spacing, different shapes and irregular shapes, which looks like a bridge but not a bridge, and may represent the river bank. There is a big tree on the left side of the land with lush branches and leaves, and mountains on both sides. On the left side of the tree, Xu You is sitting on the ground, with his right hand bent and raised to his ear. On the right side, Chao Fu is walking with a cow, and his right-hand points to Xu You. There are waves in the water, decorated with a flower and grass pattern.

Xu You and Chao Fu were famous hermits in ancient times, and they were also good friends. Chao Fu lived in seclusion in the mountains and did not seek worldly interests. When he was old, he built a nest in the tree to sleep, so he was called "Chao Fu" by people at that time.

Xu You had a good character. At that time, the emperor decided to abdicate the throne to Xu You, so he went to visit him in person. However, Xu You not only did not accept it, but lived in seclusion. Xu You expressed his unwillingness to let the world taint himself. At this time, Chaofu happened to be passing by with a cowherd, and when he saw Xu You, the pattern scene depicted in this bronze mirror came into being.

The "Xu You Chaofu" story mirror originated in the Tang Dynasty, became popular in the Song, Liao, and Jin dynasties, and declined in the Yuan Dynasty.

The Song Dynasty was an era with a high level of aesthetics. The literati at that time were not only good at poetry and songs, but also proficient in painting, music, and calligraphy. Therefore, the bronze mirrors of the Song Dynasty were different from those of previous dynasties. Not only did they have many exquisite patterns such as flowers, plants, birds, animals, mountains and rivers, small bridges, and towers, but also a large number of character story patterns appeared.

The Xu You Chaofu Story Bronze Mirror means that the literati of this period in ancient China have always pursued a social trend of being indifferent to fame and fortune, and it also reflects that people at that time hoped to live a happy and beautiful life.



The decorative pattern of the Wu Niu Chuan Yue bronze mirror is as follows: the back of the mirror is decorated with water ripples, a rhinoceros stands on the left side of the mirror button, about to wade through the water, there is a Ruyi cloud pattern on the top and bottom of the mirror button, holding up a crescent moon, there are plants on the right side of the mirror button, and the edge is decorated with two circles of sawtooth patterns and one circle of string patterns.






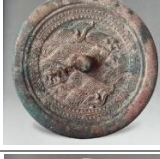

Wu Niu Chuan Yue is an ancient Chinese story. The allusion is that the water buffalo in the Jiangnan area such as the ancient Wu State was afraid of the heat, and saw the bright moon in the sky and mistook it for the scorching sun, and was afraid and panting. It is a metaphor that people will feel afraid when they encounter a similar situation again after suffering setbacks, thus losing their judgment ability. The back of this bronze mirror is decorated with folk story allusions in the character story category. Ruyi cloud pattern and crescent moon represent good luck and courage.

The decorative pattern of the Immortal Crane Longevity Bronze Mirror is as follows: There is a tree on the left side of the mirror button, with a straight trunk and horizontal branches and leaves. The mountain gate under the tree is ajar, and a maid is leaning sideways to hold a tray with an object on it. There is a bridge below the mirror button, and the stream under the bridge is flowing, rolling up waves. On the bridge, a crane flaps one wing and looks back to peck at feathers. On the right side of the mirror button, an immortal sits on the stone, and a girl stands beside the rock, pointing her hand forward, as if she is talking to the immortal.

The crane is an auspicious animal that can bring good luck and happiness to people. The bronze mirror reflects the artistic beauty of Chinese traditional culture and is a true reflection of the cultural fashion of each era. The elements of this Immortal Crane Longevity Bronze Mirror are diverse, and the patterns imply Taoist immortal thoughts and the meaning of praying for longevity and longevity. It has a high collection value and cultural and artistic appreciation value.

Table 9 *Bronze mirror information table for character story category*

No.	Name	Dynasty	Meaning	Picture
1	Figures viewing waterfalls	Song	Happy and auspicious, real-life scenes	
2	Immortal, Turtle and Crane Mirror	Song	Longevity and peace	

3	Mirror with boy and flower branches pattern	Song	A vision of happiness, sweetness, and a beautiful life	
4	Character Story Mirror	Liao	Good fortune, prosperity, peace, status	
5	Mirror with Double Fish and Mermaid Pattern	Jin	Life, Faith, Myths and Legends	
6	Character Story Handle Mirror	Jin	Noble, virtuous, prosperous and beautiful	
7	The Story of Xu You and Chao Fu	Jin	Indifferent to fame and fortune, looking forward to a happy and beautiful life	
8	The Story of Wu Niu Panting Under the Moon	Jin	Courage to face setbacks, good wishes	
9	Immortal and Crane Longevity Mirror	Jin	Longevity and good fortune	

*Note.* Author, 2024

#### 4) Inscriptions Category

Among the bronze mirrors unearthed in Datong during the Song, Liao and Jin Dynasties, the representative bronze mirrors with inscriptions include “卍” pattern mirror, Homely Wealth mirror, sunlight mirror, poetry mirror, turtle and crane longevity mirror, and continuous arc pattern and inscription mirror, a total of 6 bronze mirrors.

The decorative pattern of the “卍” bronze mirror is: the back of the mirror is decorated with a double-line “卍” pattern with the mirror button as the center, and a

circle of beads is decorated on the periphery. The "卍" pattern has a strong religious meaning.

The “卍” pattern is a Buddhist term. The translation of the "卍" in Chinese Buddhism is not consistent. A scripture in the Northern Wei Dynasty translated it into "卍", and Xuanzang and others in the Tang Dynasty translated it into "Morality", emphasizing the immeasurable merits of Buddha. The female emperor of the Tang Dynasty, Wu Zetian, defined it as "Wan", which means to gather all the auspicious merits in the world. There are two ways to write the "卍", one is right-handed and the other is left-handed ("卐"). This bronze mirror is right-handed. Most Buddhists believe that right-handed rotation is the standard, because Buddhism considers right-handed rotation auspicious, and Buddhists hold various Buddhist ceremonies in right-handed rotation. This is a mysterious symbol that is regarded as auspicious and meritorious by Buddhists.

The geometric shape formed by the "卍" pattern is also used to symbolize long-lasting wealth and honor. It carries people's good wishes. In Chinese culture, the quilts of newlyweds are embroidered with "卍" patterns, which are auspicious and called the endless pattern of "卍".

The decorative pattern of the Homely Wealth Mirror is as follows: the back of the bronze mirror is decorated with a string pattern consisting of two circles of short oblique lines, and the four-character inscription "家常富贵" is engraved between the two circles. Four nipple patterns are distributed alternately, and each character is decorated with a bird on both sides, which are distributed relatively.

The meaning of this inscribed mirror is also very straightforward. As expressed in the inscription, it means family happiness and long-lasting wealth, which is the beautiful yearning of the people at that time for family happiness and wealth.

The decorative pattern of the sunlight mirror is as follows: the outer circle of the mirror button is decorated with eight continuous arc patterns, and between the two fine string patterns is the inscription "日月之光". There is an "e" pattern between every two characters, and two groups of short oblique lines on both sides of the string pattern.

In the "Interpretation and Research on the Inscriptions on Sunlight Mirrors in the Western Han Dynasty" in "Research on Han Mirror Culture", it is mentioned that: "This 'sun' is not the 'sun' in nature, but the sun in people's minds. As we all know, humans worshiped the sun in ancient times because it brought light and warmth to people. People loved and relied on the sun, and 'sun' was worshipped as a god by people." The inscriptions on the bronze mirrors mostly reflected the spiritual life and cultural activities of people at that time. The name of the "sunlight mirror" came from the word "sunlight" in the inscription. The inscription "The Light of the Sun and the Moon" on this mirror expresses the distant and vast mysteries of heaven and earth. After sunrise, the world is bright and the body warms up. Only with light can we see the world in front of us clearly. Sunlight is a simple existence. Only with light and life

can we have this vibrant world. It expresses people's praise and yearning for the sun and light.

The decorative pattern of the poem mirror is as follows: the main pattern of this bronze mirror is the inscription: "Bright and spotless, like the moon in the sky, facing it with a straight face, you can see the virtuous in it", and there is a circle of short horizontal lines and serrated patterns near the edge.

The meaning of this poem mirror is: smooth and transparent without impurities, just like the bright moon in the sky. I tidy up my appearance in front of the bronze mirror, hoping to see a virtuous self in the mirror. It expresses the pursuit of virtuous and pure personal qualities by the owner of the bronze mirror or the pattern carver.


The decorative pattern of the turtle and crane longevity bronze mirror is as follows: the main decoration of the mirror back is the inscription: "龟鹤灵寿" four characters, in seal script, distributed above, below, left and right of the mirror button.






Seal script, one of the ancient Chinese characters, is also called seal script, which is a general term for ancient characters. In the splendid history of Chinese civilization for 5,000 years, characters have always carried the heavy responsibility of inheritance and innovation. As a unique symbol of Chinese civilization, seal script is not only the beginning of ancient Chinese calligraphy, but also an important carrier of Chinese culture. The inscription on this bronze mirror is carved in seal script, which means longevity and peace.

The decorative pattern of the mirror with continuous arc and inscription is: there is a circle of convex string pattern on the outer side of the mirror button, and twelve continuous arc patterns are decorated along the convex string pattern, and two circles of comb pattern are decorated with inscriptions around the outer side.

Although the inscribed bronze mirror is a concentrated reflection of social thoughts, it has the function of "using objects to convey the truth". But more importantly, it appears as a decoration. Therefore, we can see such a strange phenomenon on the bronze mirrors where inscriptions are popular. The inscriptions often have wrong words and missing sentences, or are randomly deleted, so that they cannot be read as a sentence. Although some of them cannot be recognized due to historical reasons, they also show the decorative charm of calligraphy and carving art at that time. This bronze mirror shows the inscription of sunlight and geometric patterns, which means: praise and yearning for the sun and light.

Table 10 *Bronze mirror information table for inscriptions category*

No.	Name	Dynasty	Meaning	Picture
1	Mirror with "卍" pattern	Song	Long-lasting wealth, infinite merits, and auspiciousness	

2	Homely Wealth Mirror	Song	Family happiness and lasting wealth	
3	Sunlight bronze mirror	Song	Yearning for love, light and warmth	
4	Poetry Mirror	Song	The pursuit of virtue and purity	
5	Turtle and Crane Longevity Mirror	Song	Longevity and peace	
6	Mirror with continuous arc pattern and inscription	Song	The concentrated reflection of social thoughts, the sun, the light	













*Note.* Author, 2024



The geographical scope of this research is the unearthed bronze mirrors in Datong City, Shanxi Province. No bronze mirrors with clear inscriptions have been found in the Liao and Jin dynasties, or they have not yet been systematically excavated and recorded. Although there are records of unearthed inscription mirrors in the Liao and Jin dynasties nationwide, this study is based on the summary and analysis of the physical bronze mirrors in Datong area. Therefore, in the table 10, only the data of Song Dynasty inscription bronze mirrors unearthed in this area are presented. Therefore, the information presented in this table reflects the actual unearthed situation in a specific area.

### 5) Crowd and Meaning

This research starts from a social perspective, combines the unearthed background of bronze mirrors in Datong City, Shanxi Province and related literature, systematically sorts out the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties, and explores their interpretation of meanings in different social groups. Through the analysis of typical patterns such as animals, flowers and birds, character stories, and inscriptions, it is found that different groups have different meanings in the corresponding bronze mirror patterns. The following table is a table of the meaning information of the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties corresponding to different groups of people.

Table 11 *The meaning of bronze mirror decorative patterns corresponding to different groups of people*

Crowd Type	Pattern	Meaning	Representative bronze mirror names	Representative bronze mirror pictures
Elderly	Phoenix patterns, auspicious animal patterns, fairy tales, auspicious inscriptions	Good luck, longevity and health	Double Phoenix Mirror, Immortal Turtle and Crane Longevity Mirror, Wild Goose Flying Through Flowers Mirror	  
Women's Group	Flowers, birds, plants, figures	Happiness and long-lasting offspring	Children wearing flower mirror, Flower pattern mirror, Auspicious animal and grape pattern mirror	  
Male Group	Dragon pattern, tiger pattern	Strength, Courage, Wealth	Buffalo and Moon Bronze Mirror, Double Dragon Mirror, Dragon and Tiger Mirror	  
Intellectual Class	Historical figures, inscriptions, landscapes and pavilions	Moral integrity, nobleness, virtuousness	Lotus pattern mirror, Poetry mirror, Character story mirror with handle	  

Children and adolescents	Flower and bird patterns, historical story patterns	Vitality, love, light	Flower and bird mirror, Sunlight mirror, Character story mirror	
Ordinary people	Double fish, auspicious clouds, birds	Prosperity, luck, wealth	Double fish mirror, Cloud dragon mirror, Homely rich mirror	

*Note.* Author, 2025

The information compilation and analysis of this table not only reveals the cultural implications behind the patterns on the bronze mirrors, but also reflects the diversity of social structures and aesthetic tastes during the Song, Liao and Jin dynasties.

#### 2.4.2 COMPOSITION AND LAYOUT

Generally speaking, after the decorative themes and contents are determined, if the decorative patterns are to be expressed clearly and completely, appropriate layout and composition methods must be selected, so that a beautiful decorative pattern can be achieved, the artistic characteristics of the decorative pattern can be achieved, and a distinctive artistic style can be formed. Therefore, the layout and composition of the decorative pattern are particularly important and critical.

Among the bronze mirrors unearthed in Datong City during the Song, Liao and Jin Dynasties, the decorative compositions include symmetrical, radial, rotating, full-flowered, single, and balanced.

##### 2.4.2.1 SYMMETRICAL COMPOSITION

Symmetry is based on the central axis or center point, with the same shape and quantity in size, shape and arrangement. This structural form of the same shape and quantity is also called "mirror reflection"(Jiang, 2021). Symmetry is the perfect form of balance, which shows the balance of force. The ancient Chinese paid attention to the balance of yin and yang, so symmetrical composition often appeared in ancient Chinese arts and crafts, and symmetrical composition is very common in the

decorative patterns of bronze mirrors. For example, the pattern on the back of the double phoenix mirror in the Song Dynasty is a typical left-right symmetrical composition. With the mirror button as the center, the left and right phoenixes are arranged in a relative manner, and the phoenix heads are symmetrical up and down. This is a typical relatively symmetrical structure. Most of the patterns are completely symmetrical, and a small part of the patterns are asymmetrical. This form makes the overall pattern stable and agile. If it is completely symmetrical, the overall pattern is too dull. The tail of the phoenix on the left in the pattern curls to the upper left, showing a pattern of winding flowers and plants, and the tail of the phoenix on the right stretches to the lower right, like a water wave pattern, and is decorated with auspicious cloud patterns around. There are changes in symmetry. Modern designers often use this composition method to design, increase the memory points of the design works, and enrich the visual experience of the works.

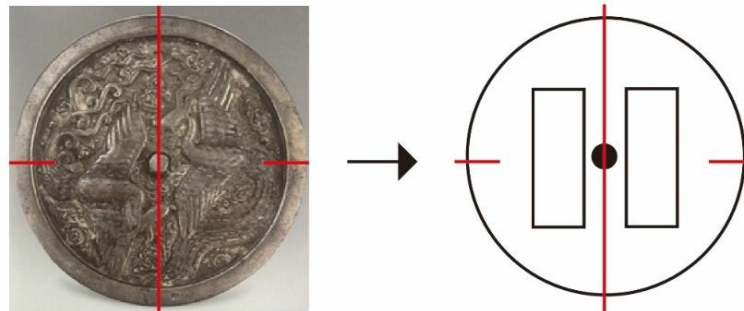





Figure 24 *Symmetrical composition of double phoenix mirror*

*Note.* Draw by the author, 2024

In addition to the Song Dynasty's double-phoenix bronze mirror, the Song Dynasty's tortoise-crane longevity mirror and the Jin Dynasty's flower-pattern bronze mirror are the main representatives of bronze mirrors unearthed in Datong during the Song, Liao and Jin dynasties with symmetrical composition (as shown in the table below). The biggest feature of symmetrical composition is stability, which gives people a sense of solemnity, seriousness and stability. This shows that the ancients expressed their psychological feelings and decorative concepts through the aesthetics of composition.

Table 12 *Symmetrical bronze mirror unearthed in Datong during the Song, Liao and Jin dynasties*

No.	Name	Dynasty	Symmetrical Form Composition	Picture
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1	Double Phoenix Bronze Mirror	Song	The two phoenixes are symmetrical, and their heads are symmetrical	
2	Bronze mirror with turtle and crane	Song	The composition is symmetrical from top to bottom and from left to right, and the content is a four-character inscription	
3	Bronze mirror with floral pattern	Jin	With the mirror button as the center, a group of floral and branch patterns are symmetrically distributed above and below	

*Note.* Author, 2024

#### 2.4.2.2 RADIAL COMPOSITION

The radial composition is mainly based on the "rice shape" as the skeleton. The graphics are distributed in a radial shape from the center to the surroundings, and the arrangement changes from dense to sparse, which is very orderly. The overall layout is regular and the proportions of each part are balanced, which makes the picture have more divergent artistic characteristics. The radial composition has a strong rhythmic effect, giving people a sense of diffusion and stretching. For example, the Four Spirits and Twelve Zodiac Inscription Mirror of the Sui Dynasty is a typical bronze mirror with radial composition, which radiates outward in the form of the twelve zodiac signs. There is also the Twelve Zodiac and Eight Diagrams bronze mirror of the Qing Dynasty, which contains the Taoist concept of the universe, and uses a method composition to reflect the direction and has a sense of order. Among the bronze mirrors unearthed and collected in Datong City during the Song, Liao and Jin Dynasties, there are fewer bronze mirrors with radial composition. There is a Song Dynasty bronze mirror with radial composition decoration, which radiates the four-character inscription "Homely Wealth" from the mirror button, and is decorated with four circular patterns and bird patterns, reflecting the ancients' beautiful hope for a happy and wealthy family.



Figure 25 *Homely rich bronze mirror radial composition*

Note. Draw by the author, 2024

#### 2.4.2.3 ROTATING COMPOSITION

Rotational composition is to rotate the pattern clockwise or counterclockwise from the center, fill the picture through rotation and repetition, and create a rhythm through rotation, making the picture full of vitality. This kind of rotation and repetition constitutes a sense of order and beauty. This composition method not only gives people a sense of neatness and beauty, but also is rich in changes in unity, breaking the dull feeling of simple repetition.




The bronze mirror with double fish pattern in the Jin Dynasty is a typical rotating composition. The ancients worshipped carp. Tao Gu's "Qingyi Lu" in the Song Dynasty recorded: "Carp are mostly dragons, with the word "king" in real script on the forehead, and the inscription "cross carp", which is a god." There are also many legends about carp leaping over the dragon gate among the people. Bronze mirrors with fish as the theme are more common in the Jin Dynasty. The bronze mirror with double fish pattern in the Song Dynasty is not as exquisite as that in the Jin Dynasty. The following picture is a representative double fish pattern mirror unearthed in Datong City. It is round and has a round button. The two fish on both sides of the button are connected head to tail, arranged in a clockwise rotation, and the bottom pattern is covered with water ripples. The rotation arrangement presents a sense of flow and whirl.







Figure 26 Rotating composition of bronze mirror with double fish pattern  
 Note. Draw by the author, 2024

The bronze mirrors unearthed in Datong during the Song, Liao and Jin dynasties were very common and numerous. The themes of bronze mirrors with this type of composition were mostly animal patterns. This type of decorative pattern mostly comes from life and historical totem culture, and the patterns are lively, interesting and full of vitality. The rotating composition, through rotation and repetition, can make the picture full of rhythm and vitality. In addition to the bronze mirrors with double fish patterns in the Jin Dynasty, there are also bronze mirrors with double dragon patterns, coiled dragon patterns, inscribed mirrors, bronze mirrors with double fish and mermaid patterns, etc. (as shown in the table below). The biggest feature of the rotating composition is rhythm and fluency.

Table 13 A rotating bronze mirror unearthed in Datong during the Song, Liao and Jin dynasties

No.	Name	Dynasty	Rotating Form Composition	Picture
1	Bronze mirror with double fish pattern	Jin	The two fish are connected head to tail and arranged in a clockwise rotation around the mirror button	
2	Diamond-shaped dragon mirror	Song	Two dragons circling in the same direction, connected head to tail, arranged in a counterclockwise rotation	
3	Double Dragon Mirror	Jin	The two dragons are connected head to tail and arranged in a counter-clockwise rotation	

4	Bronze mirror with cloud and dragon pattern	Song	The dragon pattern rotates in a "C" shape around the mirror knob, rotating clockwise	
5	Mirror with Eight-curved Cloud and Dragon Pattern	Liao	The double dragon mirror knobs are connected end to end and rotate around each other in a counter-clockwise arrangement	
6	Mirror with continuous arc pattern and inscription	Song	The back of the mirror is decorated with a circle of inscriptions arranged in a clockwise rotation around the circle	
7	Bronze mirror with double fish and mermaid pattern	Jin	The inner area is centered on the mirror button and is surrounded by a lotus. The outer area is arranged counterclockwise with mermaids, fish, sheep, cows, and horses	

*Note.* Author, 2024

#### 2.4.2.4 FULL-FANCY COMPOSITION

The full-flowered composition is to fill the entire picture with flower and branch pattern elements, creating a rich picture effect with a strong visual experience. This form of composition creates an immersive scene, the picture is vivid and the theme is prominent. Many modern design compositions use full-page composition, that is, the layout space is filled with design elements, which can produce a sense of picture substitution, give the layout a good visual tension, a strong sense of design, and not too much blank space, and the visual effect is full and rich. The Hongyan Passing Flower Mirror unearthed in Datong City during the Jin Dynasty is a representative bronze mirror of the full-flowered composition. The back of this bronze mirror is decorated with twined flower patterns, with flowers blooming in between, and four cranes flapping their wings and flying between the branches, with a lively image. The biggest feature of the full-flowered composition is the rich visual sense and strong sense of substitution.

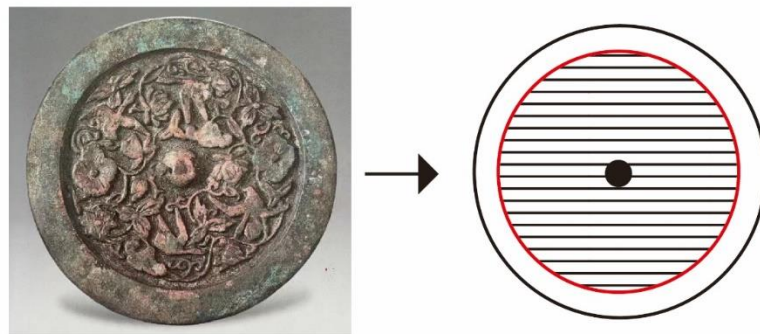



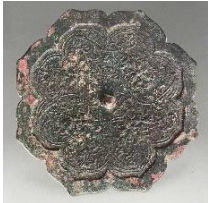


Figure 27 *The composition of the wild goose passing through the flower mirror*  
 Note. Draw by the author, 2024

Among the bronze mirrors unearthed in Datong during the Song, Liao and Jin dynasties, most of them were floral patterns. This type of decorative pattern mostly comes from natural life, and the patterns are vibrant, fresh and natural. The full-flowered composition can make the picture full of vitality by filling the picture with floral patterns. In addition to the full-flowered composition of the wild geese flying through flowers bronze mirror of the Jin Dynasty, there are also diamond-shaped bronze mirrors with flower and bird patterns, mirrors with children flying through flowers, and mirrors with twined flower patterns (as shown in the table below).

Table 14 *A bronze mirror with full-flowered patterns unearthed in Datong during the Song, Liao and Jin dynasties*

No.	Name	Dynasty	Full Flower Composition	Picture
1	The Wild Goose Passing Through the Flower Mirror	Jin	The back of the mirror is decorated with twined flowers, blooming flowers, and four cranes flapping their wings in the air	
2	Diamond-shaped bronze mirror with flower and bird patterns	Song	It is decorated with four birds, with intertwined floral patterns between the birds and cirrus patterns as embellishments	
3	Boy and Flower Mirror	Song	The inner circle is covered with five flower and leaf patterns, and the outer circle has four boys holding lotus flowers and playing among the flower branches, with bees and butterflies dotted in	

			between	
4	Mirror with intertwined branches and floral patterns	Jin	The back of the mirror is covered with broken branch floral patterns, with four flowers intertwined with branches, slender and beautiful	

*Note.* Author, 2024

#### 2.4.2.5 SINGLE FORM COMPOSITION

Single composition is a composition form centered around a main body. Single composition often has a single pattern, but the main body is prominent and clear at a glance. The surrounding area is mostly left blank to make a primary and secondary contrast in the picture. Single composition is also a common form in design and painting. For example, the single dragon mirror of the Song Dynasty is square and is now collected by the Datong Museum. The decorative pattern of this bronze mirror is a dragon with open mouth and eyes, flying dragon whiskers, a strong and powerful dragon body, and a flame-shaped gem in front of the mouth. The scales of the dragon body are distributed in a diamond shape, and the spine is undulating. It is a representative of the single composition bronze mirror of this period.

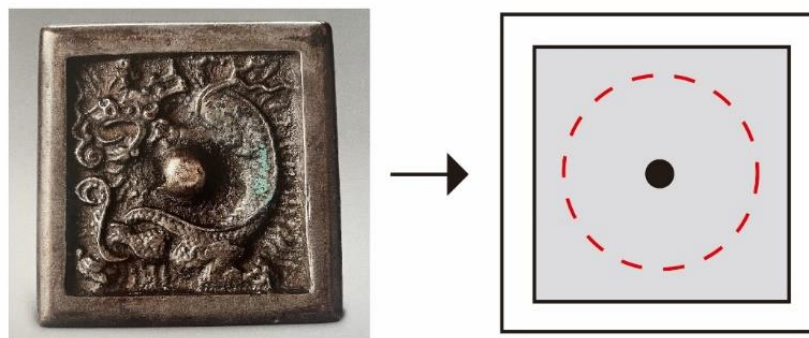





Figure 28 *Single dragon mirror single composition*

*Note.* Draw by the author, 2024

Bronze mirrors unearthed in Datong during the Song, Liao and Jin dynasties. In addition to the single dragon mirrors of the Song Dynasty, there are also swastika mirrors and flower pattern mirrors (as shown in the table below). This type of bronze mirror has a prominent main body and focuses on expressing a single design element.

Table 15 *A single-composition bronze mirror unearthed in Datong during the Song, Liao and Jin dynasties*

No.	Name	Dynasty	Single Composition	Picture
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1	Single Dragon Mirror	Song	The mirror button is decorated with a dragon pattern in the center, and a flame-shaped gem is decorated in front of the mouth	
2	Bronze mirror with "卍" pattern	Song	The mirror button is decorated with a double-line "卍" inscription in the center	
3	Bronze mirror with floral pattern	Jin	The mirror button is decorated with a single lotus flower, and there are flower branches below the mirror button	

*Note.* Author, 2024

#### 2.4.2.6 BALANCED FORM COMPOSITION

Balanced composition is not limited by the central axis and the center point. It is a balance of power. The overall picture has a kind of stability and pays more attention to visual and psychological balance. Balanced composition is more varied, freer and more individual, giving creators more room to play. The Story of Xu You and Chao Fu Mirror is a typical balanced composition. The bronze mirror is round in shape, and the back of the mirror is divided into two parts, the upper and lower parts of water and land. The patterns at the boundary are different and irregular, indicating the river bank. There is a pattern of a big tree on land, with lush branches and leaves, and mountains on both sides. Xu You sits on the left side of the tree, and Chao Fu walks with a cow on the right side. The water is decorated with waves and flowers and grass patterns. The entire back of the mirror is divided by the water and land river bank, and the pattern is evenly spread on the back of the mirror, and the visual center of the whole picture is very stable.












Figure 29 *Mirror-balanced composition of Xu You and Chao Fu's story*  
 Note. Draw by the author, 2024


The number of bronze mirrors in the Song, Liao and Jin dynasties that adopted balanced composition was the largest, and almost all of the mirrors with stories of immortals and figures, which increased greatly during this period, adopted balanced composition. The author believes that the reason why most mirrors with stories of immortals and figures adopted balanced composition is closely related to their subject matter.

Most of these mirrors with stories of immortals and figures use myths and legends as the decorative themes on the back of the mirror. In addition to the mirror with the story of Xu You and Chao Fu, there are also bronze mirrors with the story of Wu Niu Chuan Yue, mirrors with handles of figures and figures, mirrors with immortals and turtles and cranes, bronze mirror with figures viewing waterfall, Character Story Mirror, Character story hanging mirror, bronze mirrors with immortals and cranes, bronze mirrors with rhinoceros looking at the moon, and mirrors with immortals and cranes for longevity. Most of these themes are a scene, and if you want to express it clearly under the shape restricted by the back of the mirror, it is obvious that balanced composition is relatively free, giving creators more room to play, and it is the most suitable composition method.

Some inscribed mirrors also adopt this balanced composition method, such as poetry mirrors. Some inscribed mirrors are equipped with a small number of patterns to express lovesickness or pray for family members. During the Song, Liao and Jin dynasties, people paid more attention to pleasure and longed for longevity, and artistic expression methods became more diversified. Therefore, relatively free and balanced composition was the most commonly used composition method on bronze mirrors during this period.

Table 16 *A bronze mirror with a balanced pattern unearthed in Datong during the Song, Liao and Jin dynasties*

No.	Name	Dynasty	Balanced Form Composition	Picture
1	The Story of Xu You and Chao Fu	Jin	The decoration on the back of the mirror is divided into two parts, upper and lower, water and land, free and balanced	
2	The Story of Wu Niu Chuan Yue	Jin	The whole is decorated with water ripples, rhinoceros, cloud patterns, moon and plant patterns freely and evenly	
3	Character Story Handle Mirror	Jin	The trees, the woman playing the instrument, the orchid, and the two maids form the picture of the story of freedom	
4	Immortal, Turtle and Crane Longevity Mirror	Song	A balanced story scene composed of trees, immortals, waiters, cranes and turtles	
5	Figures Viewing Waterfall Mirror	Song	The decoration is a woman and a boy, bamboo forest, mountains, lotus and waterfalls, and the picture is balanced and free	
6	Character Story Mirror	Liao	Below is a bridge and a river, with a tree and a person on each side of the bank, and a running lion between the two people	
7	Character story hanging mirror	Liao	Decorated with pine trees and two people, with mountains in the distance, no mirror button, and balanced pattern	
8	Rhino Moon-gazing Immortal Mirror	Jin	Decorative clouds and crescent moon, immortals, trees, and a cow looking up, freestyle composition	
9	Immortal Crane Longevity Mirror	Jin	On the left are trees and a mountain gate, with a bridge, cranes, and a stream below. On the right are immortals and a girl	

10	Poetry Mirror	Song	The main pattern is a sixteen-character inscription, evenly distributed on the back of the mirror	
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*Note.* Author, 2024

## 2.5 CHARACTERISTICS OF BRONZE MIRROR DECORATIVE PATTERNS DURING THE SONG, LIAO AND JIN DYNASTIES

### 2.5.1 PRACTICALITY

The copper ban system during the Song, Liao and Jin dynasties was strict, and copper mirrors were also banned, but the production of copper mirrors continued to flourish, which was inseparable from the fact that copper mirrors had become an indispensable daily necessity.

The economy of the Song Dynasty was prosperous, and the social material needs of women were also increasing. During this period, women had a social custom of wearing makeup. In the Liao Dynasty, women were in fashion for face painting. Women in the Jin Dynasty also attached great importance to makeup, especially among the palace people and concubines at that time, the makeup technique of drawing eyebrows was popular.

As a practical tool for dressing and taking pictures, copper mirrors are naturally indispensable for women. The poet Wen Tingyun's "Bodhisattva Man" "The forehead is yellow on the slender hands in front of the mirror" and the poet Wang Changling's "Grief in the Boudoir" "Today I am leaving the house, brushing the mirror and sweeping my eyebrows thickly" vividly depict the scene of ancient women dressing in front of the mirror. Such themes can also be found in paintings and tomb murals, such as Wang Shen's "Embroidered Mirror in the Morning" and Su Hanchen's "Beautiful Ladies", as well as the mural of the Song Dynasty Tomb in Baisha, Henan, where the hostess is dressing herself, all of which reflect the social fashion of women dressing in front of the mirror at that time.



Figure 30 "Embroidered Mirror in the Morning" and "Beautiful Ladies"

*Note.* <https://www.shuge.org/meet/topic/84441/>, [https://www.thepaper.cn/newsDetail\\_forward\\_2742552](https://www.thepaper.cn/newsDetail_forward_2742552), 2024



Figure 31 *A mural depicting the hostess dressing herself in a Song Dynasty tomb in Baisha, Henan*

Note. [https://www.sohu.com/a/527819737\\_121123853](https://www.sohu.com/a/527819737_121123853), 2024

Bronze mirrors are not only a necessity for women to put on makeup, but also for men who like to dress up. In the book *Rong Zhai Sui Bi* written by Hong Mai in the Southern Song Dynasty, it is said that "Fan Juemin was a physiognomist at the age of 32, fat and white like a crown of jade. When he got up in the morning, wrapped his head and put on a scarf, he would look in the mirror. He was called 'Three Photos of the Physician'". In summary, we can see the wide range of bronze mirrors used at that time and the practicality of bronze mirrors.

### 2.5.2 UNIVERSALITY

In general, during the Song, Liao and Jin dynasties, social development was relatively stable, the economy was developed, and the lives of citizens were relatively rich. Meng Yuanlao described in "Dongjing Menghualu" that the Northern Song Dynasty was peaceful and prosperous, and the citizens had a lot of entertainment.

The Liao Dynasty signed the Chanyuan Alliance with the Song Dynasty. After that, the two countries basically maintained peace for more than a hundred years. The Liao Dynasty entered its heyday. During this period, society was stable and developed. The rulers promoted Confucianism and vigorously developed education and cultural undertakings. Schools were set up throughout the country, and officials were selected through examinations.

The Jin Dynasty was politically stable, peaceful for a long time, implemented imperial examinations, and was relatively prosperous internally. The rulers admired Han culture and were deeply influenced by Han culture. As the mainstream culture at that time, the Han culture of the Song Dynasty had a profound impact on the various minority regimes at that time.

The Song Dynasty had a developed economy, rich entertainment life for citizens, and a clear commercialization trend in social life. The Shijia mirrors of Huzhou in the

Song Dynasty are a reflection of the developed commodity economy. These mirrors all have rectangular mirror inscriptions with signs and advertisements, and are the most distinctive and common bronze mirrors in the Song Dynasty. From the bronze mirrors used by citizens in daily life, we can get a glimpse of the prosperity of commercial advertisements at that time, which also shows the profound influence of the economy and citizens' social life on bronze mirror art.



Figure 32 *Song Dynasty Huzhou Shijia Mirror*

Note. <https://www.zsbeike.com/tp/6155439.html>, 2024

Under the political background of this period, the decorative patterns on bronze mirrors inevitably became secularized and became available to the general public. They were no longer decorations only for royal aristocrats, but more often appeared among ordinary people as decorative patterns reflecting nature and real-life scenes. This fully reflects the universality of bronze mirrors.

### 2.5.3 PLURALISM

The Liao Dynasty was a multi-ethnic country, where ethnic minorities gathered together. They either engaged in agriculture or lived a nomadic, fishing and hunting life, forming a pattern of coexistence of multiple economic structures, and their cultural customs were also unique. In the long-term production and life process, these ethnic groups learned from each other, influenced each other, and learned from each other, which promoted the development of social history in the northern region. The decorative patterns were also rich and colorful.

Because the territory of the Liao Kingdom was long from east to west, it just became a channel for communication between the east and west. The smooth land transportation made the Liao Dynasty more extensive in contact with the West Asia region and had a deeper understanding of the West Asia culture. The Liao Kingdom not only had official exchanges with West Asia, but also had a constant stream of business travelers. The excellent cultures of various ethnic groups were inclusive and achieved a unique artistic culture.

Archaeological discoveries show that many decorative patterns at that time came from the Western Regions. There are peacocks, elephants, Hu people's music and

dance patterns, butterflies, symmetrical Pisces, scorpions, lions, lotus patterns, monsters, waterfowl, etc., which proves that the decorative patterns of the Liao Dynasty were also greatly influenced by the Western Regions.

Under the influence of Sino-Western cultural exchanges, new decorative patterns emerged. For example, the decorative patterns of the Liao Dynasty have symmetry characteristics, which are mainly absorbed from the Tang Dynasty and indirectly influenced by the Sassanid Dynasty. The characteristics of the patterns are balanced symmetry of sheep, horses, deer, birds, flowers, and trees. The Liao Dynasty developed on this basis, and patterns such as fish, Capricorn, and flowers appeared, forming patterns with West Asian style. This decorative pattern is obviously the result of cultural exchanges between the East and the West.

The Liao Dynasty at that time had close exchanges with West Asian countries. Therefore, in addition to the strong characteristics of the times and national style, the decorative pattern art style of the Liao Dynasty also has some decorative patterns with obvious exotic styles. This is undoubtedly the result of the strong influence of multiculturalism. Influence each other in production technology and artistic style, this exchange is two-way.

The decorative patterns with obvious foreign styles in the Song Dynasty and the Jin Dynasty are mirrors with phoenixes, sea beasts, and grapes. Grapes are not native to China, but are brought from the Western Regions. According to the "Qimin Yaoshu", "Emperor Wu of the Han Dynasty sent Zhang Qian to Dayuan to get grapes, and planted them beside the palace." The spreading branches and abundant fruits of grapes symbolize "wealth and longevity" and are deeply loved by people. Grape patterns have appeared in the decorative pattern art of the mainland in the Eastern Han Dynasty. In the Tang Dynasty, grape patterns have been widely used in the field of arts and crafts.

The auspicious beast grape pattern mirror is a representative work of the Tang Dynasty that absorbed the excellent parts of Persian and Indian culture. It has the largest number and delicate composition. The beasts on the grape pattern mirror have different images and postures, and are called "sea beasts" or "auspicious beasts". Most of these sports images with large and round heads are actually ancient lions(F. S, 1926).



Figure 33 *Bronze mirror with auspicious beast and grape pattern*

*Note.* Collection of Datong Museum, 2024

The Chinese phoenix bird is combined with foreign grapes, lions, birds, bees, butterflies, flowers and plants, etc., and the patterns are gorgeous. Because the phoenix bird, sea beast and grape pattern mirrors of the Tang Dynasty were favored by later generations, many imitations were made in later generations, and there were imitations in the Song and Jin Dynasties. This reflects the inheritance of foreign patterns and the pluralism of culture and art during the Song, Liao and Jin Dynasties.

#### 2.5.4 DECORATIVE

In general, the patterns on bronze mirrors during the Song, Liao and Jin dynasties have decorative functions. Many people have raised the question that mirrors reflect the front, so why do we need to design so many patterns? This is the same as when we choose modern mirrors today. In addition to needing mirrors to reflect our appearance, we will buy them because the outer packaging is beautiful and decorative. Therefore, the design ideas of modern people are consistent with those of ancient people, and both have the aesthetic needs and decorative choices of the times.

Since the Song Dynasty, due to the development of handicrafts, especially the prevalence of private workshops, various handicrafts have borrowed and imitated each other in patterns. The decoration of mass-produced products such as silk fabrics, porcelain, and bronze mirrors in the Song Dynasty is particularly obvious. The author believes that the decorative nature of bronze mirror patterns is reflected in the fact that under the social changes in the Song Dynasty, the expression of upper-class cultural and artistic forms will inevitably affect the expression of lower-class artworks. The decorative patterns of silk fabrics, porcelain, and bronze mirrors are a relationship of mutual reference and imitation.

The origins and changes of the patterns on bronze mirrors during this period were the result of a combination of factors. In addition, due to mass and commercial production in the Song Dynasty, some patterns that did not have the "educational" function of images appeared on bronze mirrors, such as flowers, phoenix patterns, and character story patterns, showing decorative characteristics. This change is different from the original concept of "images have educational functions" proposed in the Han Dynasty. This change is also an important feature of the change in the characteristics of bronze mirror decoration in the Song Dynasty. It can be regarded as "the significance of decorative images is reduced, and the decorativeness of decorative images is enhanced", forming a fixed decorative order and story text, which is easy for the people to accept, and has strong circulation and dissemination.

### 2.5.5 METAPHORICAL

Wu Hung said in the article "The Art History of "Space": Bronze mirrors, like painting screens, have two sides, and have two asymmetrical spatial relationships in front and back. The images on the back of the mirror are often decorated with flowers, fairy mountains, and stories of people. Perhaps these decorations are integrated with the person looking in the mirror, forming a definition of self-identity and image, and also expressing people's fantasy imagination of the mirror.

Cao Xueqin described a mirror called "Fengyue Baojian" in "Dream of Red Mansions", which can reflect images on both sides. Jia Rui got a mirror given to him by a Taoist priest, and told him that this mirror can reflect the illusory world of Taixu, and he must not have evil thoughts. He also warned Jia Rui that this mirror can only reflect the front, not the back. But Jia Rui looked at the back of the mirror out of curiosity. The front was Fengjie, whom he missed, and the back was a skeleton. So he walked into the mirror again and again, breaking the rules told by the Taoist priest, and was captured by the ghost.

The mirror in this story has two sides, one is the truth of warning, and the other is personal desire. Jia Rui acted on his desire and was punished. This is a fable story created by using the two-sided nature of a mirror in a literary work, but it has a hint for us to interpret the image of a mirror. The front and back of a mirror have different meanings. In our general understanding, the side of the mirror that reflects one's face is the front, and the side with the image is the back. However, in modern museum displays, it is difficult for us to see the front of the mirror, because the exhibition requires that the front side is basically facing down, revealing the back of the bronze mirror. This exhibition method makes us only focus on the back of the mirror, ignoring the role and significance of the combination of the front and back.

The bronze mirror has two sides. One side is functional, reflecting the face, the demon, and the light; the other side is the decorative side. We can see the ideal world of the Song people through the front of the mirror, and we can also block the invasion of filth through the mirror.

The author believes that the functionality of the bronze mirror decoration is very important, but the metaphor of the bronze mirror decoration should not be ignored. We study the decoration on the back of the mirror through the front of the mirror, which is a reflection of the pursuit of life in ancient times. There are themes of longevity, visiting immortals, flowers, children's play, navigation, etc., all of which carry the good wishes and metaphorical meanings of the ancients.

## 2.6 THE HISTORICAL STATUS AND INFLUENCE OF DECORATIVE PATTERNS ON BRONZE MIRRORS OF THE SONG, LIAO AND JIN DYNASTIES

### 2.6.1 HISTORICAL STATUS

During the Song, Liao and Jin Dynasties in China, in the field of decorative patterns, the decorative patterns of the Song Dynasty were the mainstream and occupied an important historical position in the history of Chinese patterns. The decorative patterns of Liao and Jin in northern China also achieved relatively high achievements, which were a beneficial supplement to the mainstream decorative patterns, and their historical status should not be ignored. Mainly in the Song Dynasty, the decorative patterns of this period had varying degrees of influence on the decorative patterns of the Yuan, Ming, Qing and modern times as well as some surrounding countries in terms of pattern subject matter, pattern composition form and pattern decoration style.

The historical status of the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties is mainly divided into two aspects for explanation. On the one hand, it is said that the decorative patterns of this period are a fusion of practical value and aesthetic value. The decorative patterns have evolved from classical to secular, and from the court to the market, laying the foundation for the development of Chinese decorative patterns.

#### *2.6.1.1 IMPORTANT TURNING POINT*

The Song, Liao and Jin dynasties were an important turning point in the history of Chinese decorative patterns. Decorative patterns in the Tang Dynasty and before were mainly used by the aristocratic class. The pattern forms showed the grandeur and luxury style of the Tang Dynasty, and had an exotic flavor. The patterns of the early Liao Dynasty mainly inherited the traditions of the Tang Dynasty, and at the same time incorporated the aesthetic characteristics of the nation, forming a rich and colorful style. Because the Liao Kingdom was geographically close to the Song Dynasty, especially in the south of Liaoning, it was particularly influenced by Song culture, and an elegant style similar to the Song style gradually emerged.

On the basis of inheriting the Tang Dynasty, the decorative patterns of the Song Dynasty absorbed the Han culture of the Later Zhou Dynasty, Southern Tang Dynasty, Western Shu and other places. Influenced by the painting art at that time, they gradually formed a realistic, flexible, elegant and beautiful style. The Song Dynasty perfected the decorative techniques of the Tang Dynasty in terms of artistic form. Geometric patterns, plant patterns, and animal patterns were finalized in the Song Dynasty. With the establishment of the civil service system, the aesthetic taste and ideological concepts of the literati class profoundly affected the development of

patterns, and a pattern style that was both rational, poetic and secular emerged. The patterns of the Song Dynasty showed the fusion of literati temperament and folk style, and had a profound impact on the decorative patterns of the Yuan, Ming and Qing Dynasties in later generations.

The Jin Dynasty was deeply influenced by the decorative style of the Song Dynasty, and its own national decorative style was also inherited and introduced into the Yuan Dynasty. In the Jin Dynasty, the society was stable and the economy was prosperous, and decoration technology further developed. Bronze mirror decorations such as flowers and fish and bird patterns appeared unrestrained and bold, with a strong folk art style. Due to the low status of literati in the Jin Dynasty, the secular aesthetic trend dominated the decorative style. Decoration of bronze mirrors and other utensils was popular among the people, reflecting the simple and generous style of northern residents. The decorative arts of the Jin Dynasty tended to "emphasis on vulgarity and despise elegance", which led the aesthetic trend of later generations of folk decoration that regarded vulgarity as beauty.

To sum up, the Song, Liao, and Jin dynasties were an era that inherited the past and opened up the future. The decorative patterns of the Song, Liao, and Jin bronze mirrors inherited the traditions of the middle and late Tang Dynasty, and followed the precedents of the Kaiyuan, Ming, and Qing dynasties. On the basis of inheriting the old system, they also innovated and developed new styles. A brand-new world, so this period is an important turning point in the history of Chinese decorative patterns.

#### *2.6.1.2 LAY THE DEVELOPMENT PATTERN*

The decorative patterns of the Song, Liao and Jin dynasties showed a transformation from classical to secular. The consumer groups gradually expanded from the upper class to the civilian class, and the patterns spread from the palace to the market. During this period, despite the constant wars between the Song, Liao and Jin regimes, the culture and economy prospered. Han culture in the Song Dynasty always dominated it.

The commodity economy in the Song Dynasty was highly developed, and commercial towns and dual-center social structures emerged. Culture and art also gradually shifted from traditional aristocratic elegant culture to secular elegant culture for the common people. The secularity of Song Dynasty culture and art is reflected in all fields, and the secularization of decorative patterns is the manifestation of this trend in art. The number of urban residents in the Song Dynasty increased greatly, and the consumption level and aesthetic taste generally improved. As a result, decorative patterns became popular, and citizens became the main group of decorative consumption, which promoted the diversification and refinement of pattern themes.

The decorative patterns of the Song Dynasty inherited the plant patterns of the Tang Dynasty in form and further explored their auspicious connotations. Among the patterns with human themes, the number of legends, Buddhism, immortals, love, and history increased, reflecting the secularization trend of social culture at that time, and

became a major change in the history of Chinese patterns. In the Song Dynasty, there also appeared antique patterns, such as nipple pattern, Hui pattern, and thunder pattern, which reflected the inheritance of traditional art and culture by people at that time.

Typical patterns of the Song Dynasty, such as broken branch flower pattern, accurately reflected the aesthetic consciousness of the Song Dynasty through realistic and vivid performance. The patterns of the Song Dynasty went from gathering to spreading, from tight to loose, forming a smart realistic, elegant and fresh style. In addition, the patterns of the Song Dynasty gradually got rid of the original limitations, and the pattern layout became more flexible and vivid, showing a rich and diverse appearance. Border patterns such as lotus petals, vortex patterns, Hui patterns and other geometric patterns were also widely used during this period, which increased the layering and three-dimensional sense of the decorative patterns.

In short, the decorative patterns of the Song, Liao and Jin Dynasties pioneered the modernization of Chinese decorative art, made the decorative patterns fully developed, and finally laid the pattern of the development of Chinese decorative patterns. It can be said that this period is a turning point in the transition of Chinese decorative art from classical to modern. The transition of art from the palace to the market is an important symbol of this transition. Decorative patterns are representative examples in the field of art.

## 2.6.2 INFLUENCE ON LATER GENERATIONS

The Song, Liao and Jin dynasties were the most mature cultural period in Chinese feudal society, and an important transitional period from the Middle Ages to the modern times in the course of history. The art of this period had unique features and values in terms of content, form and style, especially the decorative patterns, which continued to show their charm as time went by, providing an excellent model and valuable inspiration for the development of art in later generations. It had a certain influence not only on the decorative patterns of the Yuan, Ming and Qing dynasties, but also on the folk decorative patterns of modern China(Gu, 2011).

### *2.6.2.1 INFLUENCE ON DECORATIVE PATTERNS OF YUAN, MING AND QING DYNASTIES*

The main consumers of bronze mirrors in the Song, Liao and Jin dynasties were ordinary people, and their decorative patterns were closely related to folk life, customs and beliefs, so the decorative patterns were rich and colorful, and the masses loved them. The main consumers of bronze mirrors in the Yuan, Ming and Qing dynasties were still ordinary people, so many patterns had a continuous influence on the content, composition and decorative style of the patterns.

In the Yuan, Ming and Qing dynasties, people had a special liking for traditional patterns on commonly used utensils, and even expressed their nostalgia for their homeland by owning traditional patterns or using the themes of traditional patterns.

The inheritance of traditional patterns by craftsmen was also achieved through the names of workshops owned by masters or family industries. The innovation of bronze mirror decorative patterns during this period stagnated, and most of them were inherited from the decorative patterns of the Song, Liao and Jin dynasties, so the decorative patterns maintained a surprising continuity.

For example, the double fish mirror from the Yuan Dynasty unearthed in Ankangli, Datong City, has double fish connected head to tail on the back of the mirror, with water ripples as the background. The fish body is relatively wide, swinging its tail sideways, and the fish tail is folded back in the direction of the mirror button. This double fish mirror from the Yuan Dynasty inherited the decorative pattern of the double fish mirror from the Jin Dynasty. The double fish mirror is one of the most characteristic decorative patterns of bronze mirrors in the Jin Dynasty, which shows the influence and continuation of the decorative patterns of the Jin Dynasty on the decorative patterns of the Yuan Dynasty in later generations.



Figure 34 *Yuan Dynasty Double Fish Bronze Mirror*

*Note.* Collection of Datong Museum, 2024

The decorative patterns of the Song, Liao and Jin dynasties were dense and sparse, with clear priorities and reasonable arrangements. They silently conveyed a common cultural spiritual connotation that was accepted by the public, which had a great influence on later generations and provided important reference and inspiration for later craftsmen and artists to derive new artistic decorative patterns.

In terms of the connotation of decorative pattern themes, many patterns with implications and philosophical ideas appeared in the Song Dynasty, such as plant patterns such as pine, bamboo, plum, orchid, and lotus, which were used to symbolize the noble spirit of scholars and officials, as well as some historical figures with profound social reference or educational significance. As minority regimes, Liao and Jin inherited and absorbed the symbolic patterns of Tang and Song philosophical thoughts while not losing their own unique artistic style. The same was true in the Yuan Dynasty, so the connotation of decorative pattern themes was consistent with that of the Song, Liao and Jin dynasties. Judging from the themes and contents of the decorative patterns on bronze mirrors from the Yuan, Ming and Qing dynasties, there are a large number of twined flower patterns, historical figure story patterns, animal patterns, inscribed mirrors and some plain bronze mirrors from the Ming Dynasty. However, the

themes of these patterns are all inherited from the most characteristic and representative patterns of the Song, Liao and Jin dynasties, without any contemporary innovations, and their sophistication is far inferior to that of the bronze mirrors from those periods.

#### 2.6.2.2 INFLUENCE ON MODERN CHINESE FOLK DECORATIVE

##### PATTERNS

Paper-cutting, also known as paper carving, is a kind of hollow art and one of the Chinese folk arts. It gives people a sense of transparency and artistic enjoyment visually. In May 2006, the paper-cutting art heritage was approved by the State Council to be included in the first batch of national intangible cultural heritage lists. The double fish pattern, lotus pattern, dragon pattern, phoenix pattern, bird pattern, and character story pattern used in paper-cutting art all contain the characteristics of bronze mirror decoration patterns in the Song, Liao and Jin dynasties. The continuation of auspicious meanings is reflected in the bones of the Chinese people passed down from generation to generation. Paper-cut window decorations are posted during the Chinese New Year. These patterns are the transmission of the beautiful meanings of ancient Chinese patterns, and also clearly reflect the profound influence of ancient decorative patterns on modern Chinese folk decorative patterns.



Figure 35 Chinese modern paper-cutting works: left picture shows flower and bird patterns, right picture shows fish patterns

Note. <https://www.zcool.com.cn/work/ZMTc1MjU0NDg=.html>, 2024

Batik was called "waxie" in ancient times. "Xie" means dyeing. It is known as one of the three major anti-dyeing techniques in ancient China. There are few records about batik in historical documents. It was not until the Song Dynasty that there was a clear statement about batik. For example, Zhou Qufei of the Southern Song Dynasty said in "Questions and Answers outside the Lingnan Mountains": "The Yao people dyed cloth with blue spots, and the patterns were very fine. The method is to use two pieces of wood, carve fine patterns, use them to sandwich cloth, and pour wax into the carves, and then accumulate cloth, take the cloth, and throw it into the blue. After the cloth is absorbed by the blue, it is boiled to remove the wax, so it can be made into very fine spots, which are brilliant and impressive. Therefore, the method of dyeing spots is better than that of Yao people." Many modern batik decorative patterns inherit the flower patterns in bronze mirrors during the Song, Liao and Jin Dynasties. As shown in

the batik work shown below, the chrysanthemum pattern with a central rotating composition is the main pattern, supplemented by small flower and leaf patterns.



Figure 36 Chinese modern floral batik works

Note. <https://www.zcool.com.cn/work/ZMTc5NzUzMTI=.html>, 2024

### 2.6.3 IMPACT ON OTHER COUNTRIES

International commercial and cultural exchanges had already reached prosperity in the Tang Dynasty, and reached their peak in the Song Dynasty. During the Song, Liao and Jin Dynasties, there were exchanges with East Asia, Southeast Asia, and the Middle East. As an international metropolis at the time, China attracted many foreigners from countries such as Goryeo, Japan, and Indonesia. Various countries and ethnic groups maintained friendly exchanges of envoys. This shows the grand occasion of cultural exchanges and the wide influence of art and culture in China during the Song, Liao and Jin Dynasties (Van Noord & Weststeijn, 2015).

#### 2.6.3.1 GORYEO

In the Song Dynasty, due to the construction of large ships and the use of compasses, navigation technology was greatly improved, which was conducive to the expansion of overseas trade. The government regarded taxation from foreign trade as an important revenue. In the 12th and 13th centuries, mirrors with "煌丕昌天" inscriptions were widely popular in China's Song Dynasty and Goryeo. The combination of inscriptions and patterns on this type of mirror embodies the idea of antiques in the bronze mirrors of the Song, Liao and Jin dynasties. A large number of such bronze mirrors have been unearthed in both countries, and there is a close interaction between patterns, inscriptions, and art categories such as ceramics and paintings.

Scholars such as Shen Chongwe, Zhang Ying, Kong Xiangxing and others have conducted basic research on Chinese bronze mirrors with the inscription "煌丕昌天". Zhang Ying proposed that the inscriptions on such mirrors have the symbolic meaning of praying for blessings and peace. Korean scholars Lee Lan-young, Park Jin-kyung, An Kyung-sook, etc. further discussed the spread and development of the "煌丕昌天" mirror in Korea, paying attention to the variant forms and cultural significance of this type of bronze mirror in Korea.

Goryeo bronze mirrors are not completely imitations of Chinese samples, but develop a unique style based on the acceptance of Chinese culture. Most of the "煌丕昌天" nautical pattern bronze mirrors that appeared in the Goryeo Dynasty were imported from China or imitated under the influence of China, but there are also locally cast nautical pattern mirrors. These local bronze mirrors were introduced to China slightly later than the Song Dynasty, reflecting the cultural exchange and localization of nautical decoration.

Goryeo bronze mirrors are decorated in various styles, and the combination of inscriptions and nautical patterns has symbolic significance at the religious and royal levels. Through image analysis, Zheng Xiuxi proposed that the bronze mirror decoration may be related to Buddhist scripture stories, reflecting the Buddha's redemption from disasters. This religious interpretation demonstrates Goryeo's re-creation of Chinese bronze mirror culture.

The bronze mirrors with the inscription "煌丕昌天" with nautical patterns first appeared in the Song Dynasty, and were often combined with nautical patterns. About 21 bronze mirrors with nautical patterns with inscriptions have been found in China. In addition to "煌丕昌天", the inscriptions also include "天下安昌". Mirrors with the inscription "煌丕昌天" were mostly unearthed in the north and northeast. The picture below shows a bronze mirror with the inscription "煌丕昌天" with a ship pattern from the Jin Dynasty, which is now collected by the Jilin Provincial Museum.



Figure 37 Jin Dynasty "煌丕昌天" bronze mirror with sea ship pattern  
 Note. Collection of Jilin Provincial Museum,2024

The mirror body of this bronze mirror is in the shape of an eight-petal diamond flower, with a hemispherical button. The back of the mirror is embossed with a ship sailing on a rough sea. The wave crests and troughs have a large difference, which highlights the roughness of the waves. The single-masted sail is several times higher than the human body, which sets off the magnificence of the ship and the vastness of the sea. There are four sail ropes on both sides of the hull, which fix the mast from different directions. The hull part is vividly outlined with only two simple lines. The figures at the bow, stern and cabin are vaguely visible, but not particularly clear. There is a four-character inscription "煌丕昌天" above the mirror button. It means "God bless, the world prospers", and the inscription and the bronze mirror decoration echo each

other, hoping to bless smooth sailing. After all, sailing is a highly dangerous trade activity.

Among the Goryeo bronze mirrors with navigation patterns unearthed in Korea, no mirrors without the inscription “煌丕昌天” have been found. However, in addition to being combined with navigation patterns, there are also mirrors with the inscription “煌丕昌天” in South Korea Sook Myung Women University, which use this four-character inscription as an independent decorative element, and the composition is like the Song Dynasty flower mirror, so that the inscription appears in a centrally symmetrical form on the back of the mirror. It can be seen that the Korean Peninsula has not only completely imitated the “煌丕昌天” mirrors with navigation patterns introduced during the Song and Jin Dynasties, but also formed its own school of inscriptions as new decorative patterns.



Figure 38 The left picture is a Korean mirror with the inscription "煌丕昌天", and the right picture is a Chinese Song Dynasty mirror with flower patterns

Note. The left picture is collected in the Museum of Sook Myung Women University in South Korea, and the right picture comes from the "Chinese Bronze Mirror Atlas", 2024

Inscribed mirrors are an important part of bronze mirror decoration in the Song, Liao and Jin dynasties. The inscription fonts reflect the embodiment of antique thought and the admiration of traditional etiquette and political legitimacy in Song Dynasty culture. In Goryeo, inscriptions became independent decorative elements, not only on mirrors with maritime patterns, but also on bronze mirrors with other patterns, forming the characteristics of coexistence of inscriptions and patterns and mutual subjectivity.

The maritime mirrors of China and Goryeo interact in image elements and composition. The vortex-shaped waves, figures and sea beasts in the bronze mirrors of the Song Dynasty in China were absorbed and developed by the Goryeo bronze mirrors. In the Goryeo maritime mirrors, sun and moon patterns, Buddhist elements, etc. were also added to form a new visual form. This reference and re-creation of image patterns shows the profound influence of the bronze mirror culture of the Song and Jin Dynasties on Goryeo (Byington, 2019).

While absorbing the bronze mirror art of the Song, Liao and Jin dynasties, Goryeo added local elements to form a unique style. This reference and innovation in decoration not only reflects the cultural connection between the two countries, but

also demonstrates the international influence of the decorative patterns of bronze mirrors in China during the Song, Liao and Jin dynasties.

### 2.6.3.2 JAPAN

The biggest influence of Chinese bronze mirrors on Japan is the creation of Japanese mirror. Usually, ancient Chinese stories and Chinese characters are cast on the back of the mirror. Japanese bronze mirrors were introduced to Japan from China, and after a long period of imitation and innovation, they gradually formed the Japanese-style Japanese mirror. Chinese characters can be seen on many Japanese mirrors that Japanese people use to pass down from generation to generation, which is enough to show the influence of Chinese bronze mirrors on Japanese bronze mirrors.



Figure 39 *Japanese mirror decorated with Chinese characters*

Note. [https://www.thepaper.cn/newsDetail\\_forward\\_3306992](https://www.thepaper.cn/newsDetail_forward_3306992),2024

In the Heian period of Japan, from 794 to 1184 AD, eight-diamond-shaped bronze mirrors with auspicious double phoenix patterns and auspicious mandarin duck patterns gradually became popular. Japanese scholar Kubo Tomoyasu once said in "Bronze Mirrors in the Early Middle Ages" that "Since the 3rd century BC to the 3rd century AD, Chinese bronze mirrors began to be introduced to Japan. In the process of imitating Chinese bronze mirrors, Japanese bronze mirrors began to gradually emerge. From 710 to 793 AD, bronze mirrors from the Tang Dynasty in China were brought to Japan by ship. The mirrors of the same type imitated by Japan were collectively called Tang-style mirrors. They were widely used in various parts of the Japanese archipelago. From 794 to 1184 AD, phoenix patterns, arabesque patterns, and eight-diamond mirrors were first selected for the production of bronze mirrors." Phoenix patterns and eight-diamond-shaped bronze mirrors are representative bronze mirrors of the Song, Liao and Jin dynasties in China, which the author has introduced above (Watanabe, 1965).

"Records of the Three Kingdoms, Wei Shu, Japanese biography " records that when Japanese envoys arrived in Luoyang, Emperor Ming of Wei presented "one hundred bronze mirrors". During the Tang Dynasty, a large number of Japanese envoys came to China to learn advanced laws, regulations and culture, and also brought back a large number of exquisite Tang Dynasty bronze mirrors, some of which were collected

in Japan's Shōsōin and have been preserved to this day. Later, the Huzhou mirrors of the Song Dynasty were also spread to Japan through official exchanges and sporadic trade, which had a direct impact on the emergence of Japanese mirrors.

Huzhou mirrors were the most popular mirrors during the Song Dynasty, and were widely distributed. Huzhou in the Song Dynasty was one of the copper mirror production centers in the country at that time. Huzhou mirrors were also one of the most popular copper mirrors in the Song Dynasty, and enjoyed a high reputation in the mirror casting industry of the Song Dynasty. At that time, Huzhou mirrors were not only popular in various parts of the south, but also exported to Guangdong, Sichuan, Shanxi, Inner Mongolia and other places, and were even found in overseas countries. Neighboring Japan is one of the places where it was spread.



Figure 40 *A Song Dynasty Huzhou mirror unearthed in Datong City*  
 Note. Datong Museum Collection, 2024

The biggest feature of Huzhou bronze mirrors is that they are practical and light on decoration, which is very consistent with the daily needs of all classes of the emerging market society in the Song Dynasty. The inscriptions on Huzhou mirrors are full of commercial competitive advertising words and indicate the address of the workshop. It can be said that Huzhou mirrors are a famous commercial brand in the Song Dynasty. It is one of the earliest best-selling handicraft products in Huzhou.



Figure 41 *Huzhou mirror from the Song Dynasty*  
 Note. Collection of Fuyang Museum, 2024

China and Japan did not establish formal diplomatic relations during the Song Dynasty, but private trade and cultural exchanges were very active. In particular, through the booming Song-Japan trade, a large number of Song Dynasty bronze mirrors, including Huzhou mirrors, were introduced to Japan. These bronze mirrors were widely introduced into Japan through maritime merchants.

In addition to trade channels, Buddhist exchanges also provided another important channel for the introduction of Chinese bronze mirrors into Japan. During the Song Dynasty, Buddhist exchanges between China and Japan were very frequent. According to statistics from Japanese scholar Mu Guan Yasuhiko, as many as 130 Japanese monks went to the Song Dynasty in China to study, including the famous ones such as Yi Ran, Ji Zhao, Cheng Xun, Chong Yuan, Dao Yuan, etc. In addition to bringing back scriptures and books, these monks also brought back calligraphy and paintings, relics, porcelain, Buddha statues, ritual instruments, incense, bronze mirrors, swords and other items.

Song Dynasty Huzhou bronze mirrors are often found in Japanese sutra tombs, indicating that Japanese Buddhism had a great demand for these items at that time. The earliest Song Dynasty bronze mirror introduced to Japan can be traced back to 987, a plain mirror carried by the monk Yiran. According to written records, the mirror was presented by the monk Jian Duan and is one of the representatives of the mirror style of the Song Dynasty. This shows that the Song Huzhou mirror was brought to Japan by monks and then stored in the temple, becoming a symbol of cultural exchange between China and Japan.

The Song Huzhou mirror had a profound impact on the production and development of Japanese bronze mirrors. It not only played an important role in the cultural exchange between China and Japan, but also reflected the prosperous Song-Japan trade and Buddhist cultural exchange at that time.

Overall, the decorative patterns of Chinese bronze mirrors in the Song, Liao and Jin dynasties had a significant impact on the decorative style of Japanese bronze mirrors, and promoted the development and innovation of Japanese bronze mirror patterns. This not only reflects Japan's reference in art, but also reflects the interaction between China and Japan in cultural and artistic exchanges.

### 2.6.3.3 *INDONESIA*

From the late 1990s to the early 21st century, the Intan and Cirebon shipwrecks were salvaged and excavated in the Java Sea of Indonesia. Many Chinese bronze mirrors were unearthed from these two shipwrecks.

Among them, the Intan shipwreck unearthed the "乾亨通宝" lead coins that were first cast in 917 AD. Based on the style and data of the unearthed bronze mirrors and ceramics, the age was estimated to be between 918 and 960 or even later. Compared with the age previously studied by the author, it belongs to the Liao Dynasty in China. More than 600 bronze mirrors and their fragments were unearthed. All the bronze mirrors are concentrated in the south end and the middle north of the shipwreck. In

addition, the rust marks on some bronze mirrors show that they may have been wrapped with silk.

Most of the bronze mirrors found in the water are broken, and the number is difficult to determine. Among them, there are more than 500 fragments of Java bronze mirrors, that is, Indonesian bronze mirrors, which may actually contain more than 200 bronze mirrors, divided into two types: plain mirrors with handles and plain mirrors. There is a conical protrusion in the middle of the back of the mirror, and there is no other decoration on the surface except concentric circle string patterns. The plain mirror with handle is made of the mirror and the handle cast separately and then welded. Only one complete mirror was found, with a mirror diameter of 13 cm and a plain mirror handle of 9 cm long.

Among the 95 Chinese bronze mirrors and their fragments, 21 were found to be complete or nearly complete during the official excavation, plus 5 were obtained before the excavation, for a total of 26 mirrors, with diameters ranging from 7 to 28.5 cm.

Table 17 *Statistics of bronze mirrors recovered from the Intan shipwreck*

Area	Mirror type and quantity	Diameter (cm)
Java	1 complete plain mirror with handle, 205 plain mirror handle fragments, 97 decorated mirror handle fragments	Complete mirror diameter (13), mirror handle length (9), mirror handle fragment length (5-9)
	Plain mirror fragment 254	6-13
China	Mirror with dragon and tiger patterns 1	10
	Bird and animal layout mirror 1	12.5
	Square mythical beast mirror 1	12.8
	Auspicious Beast Mirror 1	10.8
	Auspicious Beast Grape Mirror 3	11,17.2,23
	Square auspicious animal grape mirror 1	11
	Diamond-shaped bird around flower branch mirror 2	9.5,10.5
	Diamond-shaped mirror with birds, animals, flowers and branches 2	15.5,17
	Diamond-shaped flower mirror 1	9.8
	Diamond-shaped double-ring flower and bird mirror 1, fragment	9.2
	Diamond-shaped two-bird mirror 1	11.8
	Diamond shaped flower branch mirror 1	12.8
	Diamond shaped double parrot mirror 1	18
Diamond Phoenix Mirror 1, fragment	13	

Broken branch flower mirror 1	21.5
"日月星辰" Inscribed Mirror 2	12.5,15
Landscape Bagua Inscription Mirror 2	11.8
Plain mirror 1	18
Square plain mirror 1	7

*Note.* Author, 2024

Although the age spans a hundred years, the number and types of Chinese bronze mirrors in the Intan shipwreck are very rich. The "old mirrors" represented by auspicious animal and grape mirrors, diamond or sunflower-shaped flower and bird mirrors also account for about half, and the types are rarely repeated. The auspicious animal and grape mirror is a typical decorative pattern in the Song, Liao and Jin Dynasties. The flower and bird pattern bronze mirror also appears frequently in the decorative patterns of bronze mirrors in China during the Song, Liao and Jin Dynasties. The sun, moon and stars inscribed mirror is also one of the main representatives of the inscribed mirrors in the Song Dynasty. In addition, there are lotus pattern bronze mirrors, etc., which appear in the decorative patterns of bronze mirrors in this study. Therefore, it can be seen that the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties were spread and influenced in Southeast Asia and Indonesia through maritime trade.



Figure 42 Part of the bronze mirror recovered from the Intan shipwreck

*Note.* 1. Plain mirror with handle, 2. Mirror with dragon and tiger patterns, 3. Mirror with auspicious animals and grapes, 4. Mirror with "日月星辰", 5. Mirror with broken branches and flowers, 6. Mirror with diamond-shaped branches of birds and animals, 7.

Mirror with diamond-shaped branches of birds and flowers, 8. Mirror with diamond-shaped double parrots, 9. Mirror with landscape and eight trigrams.  
<http://www.sanyamuseum.com/a/chenliexuanjiao/2023/0927/3840.html>,2024

After formal archaeological excavation, the Cirebon shipwreck has recovered a Yue kiln celadon bowl with "戊辰徐记造" engraved on the bottom foot, as well as a large number of "乾亨通宝" lead coins. The period was the Northern Song Dynasty, that is, 968 AD. About 30 bronze mirrors were recovered. 10 were found on the bow and 6 on the starboard side of the wreck. There are 20 Javanese mirrors with pictures or data in the data, of which 8 are plain mirrors with handles, the same as those found in the Intan shipwreck. The handles are also plain and decorated, with the former being slightly more common; 12 are plain mirrors, some of which are the mirror surface of plain mirrors with handles. There are 10 Chinese bronze mirrors, of which the most helpful in determining the age of the shipwreck is the "Ya"-shaped broken branch flower mirror. This shape with very obvious convex sides appeared in the late 10th century. The Datong Museum has a Song Dynasty Ya-shaped plain mirror with a side length of 12 cm. In summary, this ship was carrying bronze mirrors from the Song Dynasty in China to Indonesia and even Southeast Asia.



Figure 43 *Song Dynasty Ya-shaped plain mirror*  
 Note. Collection of Datong Museum,2024



Figure 44 *The Ya-shaped branch mirror from the Cirebon shipwreck*  
 Note. <http://www.sanyamuseum.com/a/chenliexuanjiao/2023/0927/3840.html>,2024

Table 18 Statistics of bronze mirrors recovered from the Cirebon shipwreck

Area	Mirror type and quantity	Diameter (cm)
Java	Plain mirror with handle 8	24
	Plain mirror 12	7.5-13
China	Mirror of Gods and Beasts 1	13
	Auspicious Beast Grape Mirror 1	12
	Square auspicious animal grape mirror 1	8.2
	Diamond-shaped dragon mirror 1	22
	Round flower mirror 1	13.6
	Diamond Character Story Mirror 1	15
	Double parrot mirror 1	27.5
	The Ya-shaped branch mirror	17
	Bagua Star Inscription Mirror	10

Note. Author, 2024



Figure 45 Part of the bronze mirror recovered from the Cirebon shipwreck

Note. 1. Mirror with gods and beasts, 2. Mirror with auspicious beasts and grapes, 3. Mirror with round flowers, 4. Mirror with double parrots, 5. Mirror with diamond-shaped figures and stories, 6. Mirror with square-shaped auspicious beasts and grapes, 7. Bagua Star Inscription Mirror, 8. Diamond-shaped dragon mirror, 9. The Ya-shaped branch mirror.

<http://www.sanyamuseum.com/a/chenliexuanjiao/2023/0927/3840.html>, 2024

The unique value of the artifacts recovered from the trade shipwreck is that they help to establish the connection between the starting point and the end point of trade. The academic community has conducted a lot of discussions on the nature and scope of trade of these two merchant ships from the perspective of the source of goods, the type of cargo, and the ship's nationality. The Intan merchant ship and the Cirebon merchant ship were both Southeast Asian ships, dating back to the 10th century. The loading place of Chinese cargo was a transit port in Southeast Asia or China, and the destination range was mainly in Southeast Asia. The directionality of the recovered bronze mirror is basically consistent with this.

In summary, the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China had a great influence on Southeast Asia, especially Indonesia, and were very popular in the Southeast Asian market, reflecting the demand for Chinese bronze mirrors and the love for decorative patterns in Chinese bronze mirrors in Southeast Asia.

During the Song, Liao and Jin dynasties, China promoted economic and cultural exchanges with other countries through the export of foreign goods, and then spread the art of decorative patterns to these countries. The influence of the decorative pattern art of bronze mirrors in the Song, Liao and Jin dynasties can be observed in the entire East Asian cultural circle. Although there are not many documents and objects that directly record the spread of decorative patterns, the excavation of objects and the words between the lines of documents are enough to prove the influence of bronze mirror decorative patterns in this period on many overseas countries and regions (Commission, 1996).

## **2.7 ANALYSIS ON THE CURRENT APPLICATION STATUS OF BRONZE MIRROR DECORATIVE PATTERNS IN THE FIELD OF MODERN ART DESIGN**

### **2.7.1 APPLICATION STATUS IN LOGO DESIGN**

With the continuous development of modern logo design concepts, the influence of bronze mirror decorative patterns on modern logo design is also increasing. In many cases, the relevant elements of bronze mirror decoration have been fully integrated into modern logo design. For example, the emblem of the 11th National Games held in Shandong, China in 2009, with the theme of "Harmonious China, Vibrant Shandong", is composed of 11 unique competitive figures. This design concept is derived from the bronze mirror artifacts with regular patterns. The emblem adopts the four-point layout method, which perfectly integrates the original abstract geometric figures and shows the theme of harmonious development of the Universiade.



Figure 46 The left picture shows the emblem of the 11th National Games held in Shandong, China in 2009, and the right picture shows a bronze mirror with regular patterns.

Note. Baidu Encyclopedia, 2024

Another example is the logo design of the Youth Camp of the 2008 Beijing Olympic Games. The logo is inspired by the modeling of the Flying Fairy Bronze Mirror of the Tang Dynasty. The five human figures representing the five continents are integrated together through the organization and layout method suitable for the pattern, which represents the spirit of harmonious and united coexistence of the youth of the five continents. The logo is closely related to the Beijing Olympic Games, and the overall concept is clear and concise, which makes people feel the youthful vigor of the youth at a glance.



Figure 47 The left picture shows the logo of the 2008 Beijing Olympic Youth Camp, and the right picture shows a bronze mirror with flying fairy patterns.

Note. Baidu Encyclopedia and Collection of Hunan Provincial Museum, 2024

Modern logo design pursues the artistic law of design itself, integrating cultural connotation and expression form, and influencing each other, so as to show the meaning of the design itself to people. For example, the design concept of China Mobile's logo design is based on the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China. The main outline of the logo is a "circle", which symbolizes the meaning of global communication, which is similar to the development products of China Mobile. Secondly, there is a set of flat hexahedral lines in the logo, which symbolizes the cellular network. Although the lines seem to be crisscrossed, they represent the characteristics of China Mobile's network that is connected in all directions, and people can understand the meaning at a glance. Finally, a pair of hands

holding together are constructed between the two sets of lines, which means that China Mobile's business philosophy is harmony and win-win, which undoubtedly narrows the distance between enterprises and society.



Figure 48 The left picture shows the logo of China Mobile Communications, and the right picture shows a bronze mirror with double fish pattern from the Jin Dynasty.

Note. Baidu Encyclopedia and Collection of Datong Museum, 2024

Starting from the perspective of ancient Chinese bronze mirror decorative patterns, the author analyzes and sorts out the cases of modern logo design and traditional art and culture. In summary, in the cases of modern logo design and innovative design of bronze mirror decorative patterns, some logos use traditional auspicious patterns, such as the double fish pattern, and redesign the auspicious patterns again to make them conform to modern aesthetics. Some logo designs adopt diversified layout methods, for example, some logo design schemes use the "concentric circle" layout commonly used in ancient bronze mirror decorations; the logo design of the Beijing Olympic Youth Camp held in 2008 draws on the surrounding layout method in bronze mirror decorative patterns. Some logos select some design elements from ancient bronze mirror decorative patterns and refine them in modern designs, such as the wide strip fold line elements in the regular mirror.

In the fierce market competition, the requirements for modern logo design are constantly rising, and the visual communication needs to be clearer and the design cultural connotation needs to be fuller. The collision between classical patterns and modern styles has produced a new visual image, which makes the decorative patterns in ancient bronze mirrors have a new expression language in modern logo design(Chen, 2015).

### 2.7.2 APPLICATION STATUS IN JEWELRY DESIGN

The application of traditional patterns in modern art design includes direct application and re-creation design application. First of all, we need to clarify a concept. Direct application is not simply taking and piling up. It is mainly to re-attach traditional cultural elements to a new carrier, re-set a visual language environment for it, and continue to play the original graphic information. This direct use should be a reintegrated concept, a positive expression and creation. It needs to take into account a series of factors such as the environment, specific craftsmanship and carrier adaptation.

Only by using the most appropriate combination can the value of the graphics be increased and a unique charm be expressed.

The corsage ornament in the picture below directly uses the coiled dragon pattern on the bronze mirror of the Spring and Autumn Period and the Warring States Period as the main image. Because of the exquisite and fine production process, coupled with the noble platinum material, this small ornament exudes a spiritual, simple, noble and elegant temperament, which greatly enhances the image of the traditional pattern of the bronze mirror. Making the best use of things is the traditional concept of the Chinese nation.



Figure 49 The left picture shows a corsage ornament with a coiled dragon pattern, and the right picture shows a bronze mirror with a coiled dragon pattern from the Warring States Period.

Note. "Bronze Mirror Culture and Patterns", 2024

The re-creation of design applications is to seek design inspiration from traditional Chinese bronze mirror patterns, extract design elements, and make these works full of Chinese traditional flavor deeply loved by domestic and foreign consumers once they are launched. This phenomenon shows the international market value and design value of Chinese traditional patterns. For example, the figure below shows that Chinese designers extract elements of traditional patterns based on the curling grass pattern and grape pattern in the decorative patterns of Chinese bronze mirrors, combining traditional decorative patterns with modern jewelry, presenting artistic jewelry with modern aesthetics(Tian, 2020).

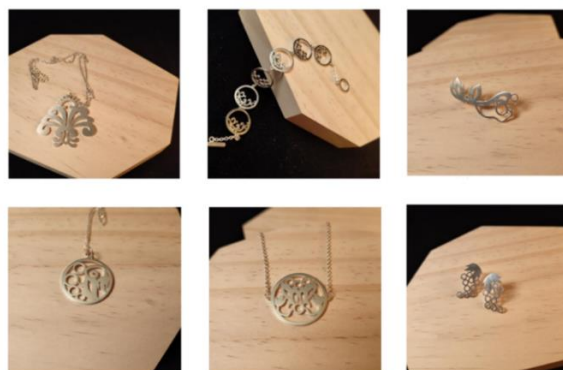


Figure 50 Modern jewelry designs with bronze mirror patterns.

Note. Dissertations on CNKI, 2024

When these ancient traditional cultures and patterns are combined with modern popular elements, modern jewelry appears in front of us with a new face. National culture and traditional culture are specific personalized symbols formed by a country or nation in the development of history. This cultural symbol can appear in all areas of life and form a style with local flavor.

Nowadays, if you ask whether China has any personalized symbols? Are there any local characteristics? The person asking the question may also be at a loss. Influenced by fashion trends, the popularity of Korean, Japanese, European and American styles, many Chinese people have forgotten their country's traditional culture, and international friends have no way to understand and recognize Chinese traditional culture. With the continuous exchange and integration of world culture and art, it has gradually lost its unique characteristics, so people began to advocate being rooted in local culture. With the slogan "Only national is eternal", all ethnic groups began to look for their own personalized characteristics. No matter how the international trend blows, the works with traditional culture and national characteristics will never go out. We designers and design researchers should inherit and carry forward the national traditional culture and art, and explore an effective design path that has both traditional cultural charm and meets the aesthetics of modern people.

### 2.7.3 APPLICATION STATUS IN CULTURAL AND CREATIVE DESIGN

The decorative patterns of bronze mirrors are not just simple decorative means, they contain profound cultural connotations, reflecting the spiritual and cultural height and social outlook of a specific historical period. As an important carrier, bronze mirrors show unique artistic charm through their decorations. In modern society, bronze mirrors have become highly sought-after collectibles due to their unique historical and artistic value, and their decorations have been widely appreciated and recognized in the process of dissemination.

In recent years, with the vigorous development of China's cultural and creative industries, many cultural and creative products are based on traditional culture, drawing nourishment from it and gaining creative inspiration. Among them, the decorative patterns of bronze mirrors, with their unique formal beauty and profound cultural connotations, have become one of the sources of inspiration for contemporary designers. This not only highlights the importance of traditional culture in modern design, but also injects new vitality into its inheritance and development in contemporary society.

For example, some cultural and creative designs on the Chinese market include the redesign of decorative patterns on Chinese bronze mirrors, including scarves, folding fans, headphone packaging, backpacks, bookmarks(Wang, 2023). The pictures below are some of the cultural and creative pictures. The designer chose the decorative patterns of Tang Dynasty bronze mirrors with animal and floral patterns for

the design. Both the element extraction and the color selection reflect the traditional Chinese patterns and color art.

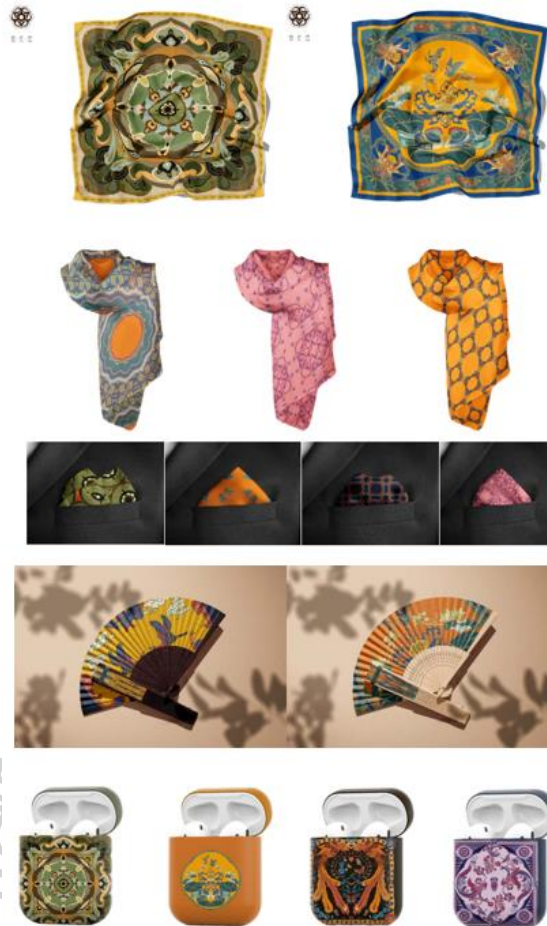


Figure 51 *Some bronze mirror cultural and creative products.*  
*Note.* Dissertations on CNKI, 2024

Art is a concentrated reflection of social economy and culture. The patterns of bronze mirrors are a summary of the experience and wisdom of our ancestors. The rich themes of its patterns are rich in powerful connotations, spiritual pursuits and rational design concepts, which can bring us strong psychological comfort and design thinking. Modern design is constantly developing and innovating. Designers need to explore the changes and developments of bronze mirror patterns in various historical dynasties, deepen their cultural heritage, creation ideas and design concepts, and enhance their ability to recognize, understand and analyze Chinese bronze mirror patterns(Li, 2024).

In the context of the development of the modern design industry, Chinese bronze mirror patterns have rich cultural connotations and artistic value. Integrating them into modern cultural and creative design and product packaging design can enhance the cultural connotation and artistic value of products. For example, in the packaging design of China Three Kingdoms Wine, the designer draws on the spiritual outlook and

decorative features of Tang Dynasty bronze mirrors. It is not difficult to see from the bottle and box that the entire virtual and real space uses the radiation pattern, Suzaku Xuanwu pattern, tangled branch pattern and formation inscription of Tang mirrors as the design language, which makes up for the cultural fault and aesthetic fatigue of modern fast-food design(Dai, 2017).



Figure 52 "Three Kingdoms Wine" packaging design.

Note. China Journal: PACKAGING ENGINEERING, Vol. 38, No. 18, p. 248, 2024

This section introduces the application cases of Chinese bronze mirror decorative patterns in modern cultural and creative design and packaging design. These designs are aimed at promoting the innovation and integration of modern design and meeting the diversified needs of the market. The decorative beauty of bronze mirrors and the beauty of modern design have always accompanied our lives. The high development of modern technology and the continuous enrichment of products and materials have provided a broader space for the development of decorative art.

## 2.8 THEORY AND RELATED RESEARCH

### 2.8.1 SHAPE GRAMMAR THEORY

Shape grammar is a computer-aided design method that can generate new shapes according to certain rules based on people's design ideas and requirements. Shape refers to a combination of finite straight-line segments with symbolic marks to indicate the direction of shape generation; rules refer to the regulations for changing shapes. In a broad sense, shape grammar is the analysis, description and induction of existing pattern characteristics; reproducing and developing original characteristics to form a new style(Li, 1998).

Shape grammar is a design method for traditional patterns. Definition: Shape grammar is a design reasoning method based on shape operations. It arranges and combines one or several basic shapes in a certain spatial relationship according to the grammatical relationship and rules of the shape, thereby forming a new shape and deriving a series of new design schemes, while having a certain continuity(Vitins &

Axhausen, 2016). It shifts the focus of design from function, structure, culture, etc. to the relationship between form and form.

"Shape grammar" was proposed by American architecture professor Carl Steinitz in 1975. In 1980, he published an article entitled "Introduction to Shape and Shape Grammar". In 1982, he proposed the concept of set grammar, further unifying shape grammar. Later, this theory was applied from architectural design to product design, and its feasibility was also proved by a large number of practical cases.

According to Carl Steinitz definition, shape grammar is expressed as a four-tuple formula, namely:  $SG = (S, L, R, I)$ . In this formula, SG represents the shape set derived from S by operations such as scale and rotation. S represents a finite set of shapes; L represents a finite set of labels; R represents a finite set of inference rules; I represent the initial shape. A shape set defined by a shape grammar is called a language, which contains all unsigned shapes or signed shapes generated by the shape grammar, each of which is derived from the initial shape by applying shape rules.

Shape grammar is a design reasoning method that uses signed shapes as basic elements and uses grammatical structures to analyze and generate new shapes. It is also a design method based on operation rules. Shape grammar can generate new graphics according to people's ideas and requirements by deforming and combining different basic graphics according to certain rules. This new graphic is a reproduction and development of the original graphic. It not only has the characteristics of the previous graphic, but also forms a new style, forming a "1+1>2" effect(Wu, 2024). Design paper writing generally includes three parts: 1) Acquisition of user needs; 2) Acquisition of design elements; 3) Guiding design practice. We can find a method to help us achieve our goals in each part. And shape grammar is a method to guide design practice.

Shape grammar reasoning rules can be divided into generative rules and derivative rules. Generative rules include addition, deletion and substitution; derivative rules include scaling, mirroring, copying, rotation, shearing and fine-tuning.

Addition and deletion refer to adding or deleting the characteristic curves of shape elements; substitution refers to replacing the characteristic curves in the original shape elements; scaling refers to enlarging or reducing the characteristic curves of shape elements; mirroring refers to flipping shape elements along the axis; copying refers to copying and moving shape elements; rotation refers to rotating shape elements at a specific angle with a certain point in space as the center of the circle; shearing refers to displacement of the key points of shape elements; fine-tuning refers to slight adjustments to some nodes in shape elements. The figure below shows a schematic diagram of the researchers' generation rules for the shape grammar of the traditional pattern design method. R1 is translation, R2 is vertical mirroring, R3 is horizontal mirroring, R4 is center rotation, and R5 is origin rotation.

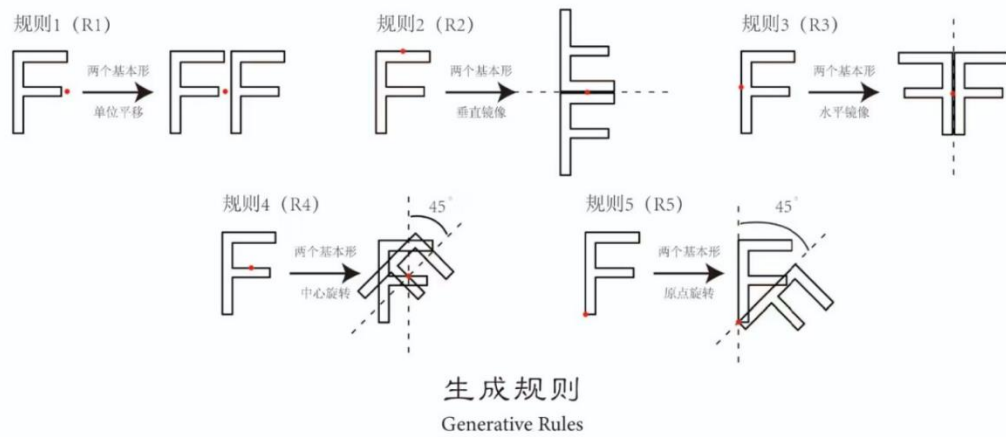


Figure 53 Schematic diagram of the generation rules of shape grammar  
Note. Researchers draw their own, 2024

Derivative rules are rule changes with more parameters and more steps based on generative rules, which can generate more complex patterns and designs. The figure below is a schematic diagram of the shape grammar derivative rules designed by researchers.

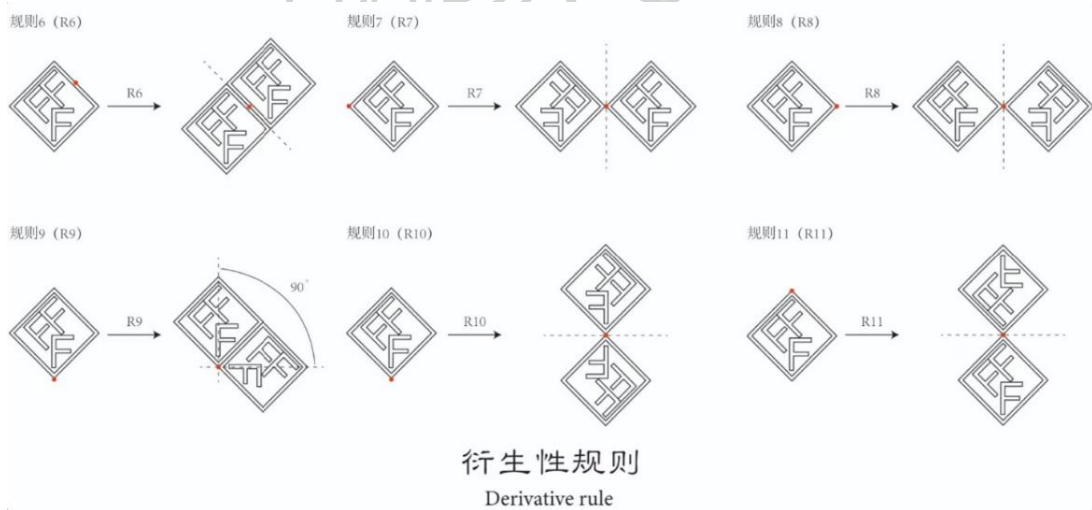


Figure 54 Schematic diagram of shape grammar derivation rules  
Note. Researchers draw their own, 2024

Designers first extract elements from traditional patterns, and then simplify and deform the elements to form an innovative pattern element, which will be more modern. This design method not only conforms to the traditional Chinese concept of balance and symmetry, but also has a modern minimalist aesthetic style.

Shape grammar was first proposed and applied to painting and sculpture creation, and later expanded to innovative pattern design, product brand recognition and other fields (Martino, 2010). It is a design method based on operation rules. At present, shape

grammar has been successfully applied to architectural design, product design, pattern design and other fields, and its feasibility has been proved by a large number of practical cases.

Before applying shape grammar, researchers often need to establish an element library, select design elements from the element library and design them under the guidance of shape grammar. Therefore, shape grammar is mostly used in designs evolved from symbolic patterns, such as the evolutionary design of Chinese intangible cultural heritage patterns and the evolutionary design of Chinese traditional decorative patterns(Knight, 1993).

The researchers applied the design method of shape grammar to the protection and inheritance of traditional culture. In the field of innovative design of traditional ethnic patterns, the deductive rules of shape grammar were applied to pattern changes to quickly generate a large number of schemes and expand the pattern combination methods, proving the innovation and effectiveness of shape grammar in the dissemination of traditional graphic patterns. When designing innovative bronze mirror decorative pattern artworks, the shape grammar deduction model was applied to make the traditional pattern elements undergo multiple evolutions and discuss the generation of schemes.

In summary, shape grammar helps to serialize complex decorative pattern designs and provides scientific theoretical guidance for the development of traditional patterns. Shape grammar is an effective way to inherit traditional culture.

### 2.8.2 CONCEPT OF RUBBING ART

Rubbing is an ancient printing technique invented during the reign of Emperor Ling of the Eastern Han Dynasty. The method is to cover the work tightly with a piece of paper and rub it with black or colored materials. The traditional rubbing materials are rice paper and a block of black material called rubbing wax. Rubbing is widely used to reproduce various reliefs from various cultural eras; to reproduce stone carvings, especially those of ancient China and other Asian cultures; to reproduce monumental brass carvings in medieval churches; to reproduce tombstones before the founding of the United States; and even to copy fish in Japan. Artists also regard rubbing technology as a creative process. They color the rubbings and add or modify the original lines(O’Sullivan, 2019).

Rubbing art is an ancient traditional skill. Rubbing is also called cicada sloughing in China, and the Chinese pinyin is "tà yìn". It is a special printing technique. The characteristics can be summarized as the words and pictures on the stele are positive, the result of rubbing is also positive, and the black and white on the rubbing are opposite; the rubbing is convex, and the decorative patterns and charm of the words and pictures in the rubbing are all preserved.

Rubbings: also known as rubbings, refers to the paper that rubs the shape of cultural relics such as inscriptions, stone carvings, bronzes, and the text and patterns

on them. It is an ancient traditional art in my country and one of the important carriers of recording Chinese culture. Useful materials can be found in history, geography, economy, ethnicity, folklore, literature, art, technology, architecture, etc. Rubbing techniques play an important role in the preservation and dissemination of ancient cultural relics. Even now, rubbing techniques are still used in the fields of cultural relics, archaeology, crafts, and art research(Cruickshanks et al., 2025).

With the rise of bronze mirror collections in recent years, bronze mirror rubbings have gradually entered people's field of vision. Compared with the difficult full-type rubbings of bronze ware, bronze mirror rubbings are more colorful and unique in their variety. Compared with stone rubbings and stele rubbings, bronze mirror rubbings are more colorful with pictures and texts; compared with tile ridges, Han bricks and stone portraits, bronze mirror rubbings are more delicate and regular.

Bronze mirrors have a long history, accompanying the long-standing Chinese civilization. The essence of national culture is reflected in the production and decorative patterns of bronze mirrors. On the other hand, due to the different sites of excavation, ancient bronze mirrors are often rusted and stained, making it difficult for us to see their appearance clearly. Bronze mirror rubbings can solve this problem well.

The patterns of bronze mirrors often have background patterns under the main patterns, and these background patterns set off the main patterns, which complement each other. The rubbings of such bronze mirrors can often rub out two to three layers of patterns, forming a beautiful pattern that is fascinating. Even people who don't understand bronze mirrors will be amazed at its exquisiteness after seeing it(Eckhoff, 2017).

The art of bronze mirror rubbing has been listed as an intangible cultural heritage of China. It is an art form for spreading and promoting excellent national culture. The bronze mirror rubbing activity can let the public experience the artistic charm of bronze mirror decorative patterns more directly(Clottes, 2008).

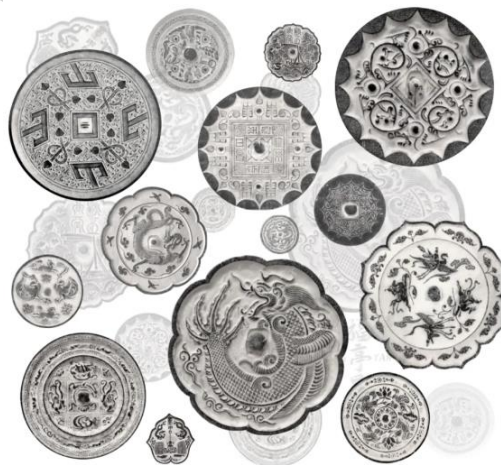


Figure 55 *Some bronze mirror rubbings*

Note. <https://www.sohu.com>, 2024

### 2.8.3 SEMIOTICS THEORY

Semiotics theory originated from the ancient Greek word "semion", which means symbol. Generally speaking, semiotics is the study of symbols, which usually indicate hidden or important meanings. Semiotics has a long history, and its main founders include Ferdinand de Saussure and Charles Sanders Peirce (Neich, 1984).

Ferdinand de Saussure regarded symbols as the basic units of meaning and proposed a binary structure theory that symbols consist of "signifiers" and "signifieds". Signifiers are the formal manifestations of symbols, such as sounds, words, images or actions; signifieds are the concepts or objects represented by symbols.

In the research of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties, the specific forms of patterns (such as phoenix patterns and fish patterns) can be regarded as signifiers, and the cultural implications behind them (such as auspiciousness and wealth) are signifieds.

Charles Sanders Peirce's semiotic theory focuses on the deep mechanism of symbols in the process of meaning generation. He proposed that signs can be divided into three types: iconic signs, indexical signs, and symbolic signs. Iconic signs have clear physical similarities between the signifier and the signified, such as an image of a bicycle is an iconic sign of its form. Indexical signs have factual connections between the signifier and the signified, such as the "skull and crossbones" symbol usually implies danger. The meaning of symbolic signs is determined by the cultural background or knowledge system, such as the auspicious cloud pattern on the bronze mirror decoration pattern symbolizes auspiciousness (Bal & Bryson, 1991).

Roland Barthes further developed the semiotic theory and proposed the concepts of polysemy and mythological levels of symbols in "Mythology". He believed that symbols can generate multiple meanings in different contexts. The same pattern may symbolize power in aristocratic culture and happiness in folk culture. This theory provides a framework for interpreting the cultural significance of bronze mirror patterns in different periods and contexts (Hilpinen, 2015).

In the research of bronze mirror decoration patterns in the Song, Liao and Jin dynasties, semiotic theory provides a systematic perspective for analyzing the cultural connotations and social functions of patterns. For example, "Double Fish Pattern" may symbolize abundance and wealth, while "Cloud Pattern" implies the good wishes of good luck and good fortune. Through semiotic analysis, we can reveal the symbolic logic behind the pattern and its changes in social significance in different periods.

In addition, semiotic theory provides important guidance for the modern design of bronze mirror patterns. By reinterpreting the symbolic metaphors and ambiguity of traditional patterns, designers can integrate them into the contemporary cultural context and give traditional patterns new cultural expressions. The combination of semiotics and visual literacy not only enhances the designer's ability to interpret visual information, but also optimizes his ability to embed deep cultural meanings in his design works (Zylko, 2001). Especially in designs that are closely related to

cultural contexts, semiotic theory helps designers understand and express the cultural symbols and meanings in their works.

#### 2.8.4 PARAMETRIC DESIGN THEORY

Parametric design theory is a design method based on mathematics and computer algorithms, emphasizing the generation of diverse design forms through the adjustment of parameter variables. Its core is to use parameters to control the elements of form, structure and decoration in the design process to achieve the accuracy and variability of the design(Picon, 2011).

In the research of bronze mirror decorative patterns from the Song, Liao, and Jin dynasties, parametric design theory offers a new perspective for deconstructing and reconstructing historical patterns. By extracting the elements of bronze mirror decorative patterns into mathematical or geometric parameters, researchers can analyze and simulate their structural laws, symmetry characteristics and spatial distribution(Imperiale, 2018).

Patrik Schumacher is one of the main advocates of parametric design. He proposed "Parametricism" and believed that parametric design uses an algorithmic form generation mechanism to transform the design from static traditional forms to dynamic form generation. This theory provides theoretical support for the design laws and innovative designs of bronze mirror decorative patterns. In addition, Robert Woodbury emphasized in "Elements of Parametric Design" that the core of parametric design is to establish rules for form generation through parameter variables. Based on Robert Woodbury theory, the complex pattern structure in the bronze mirror pattern can be transformed into a parametric formal language, and the evolution path of the pattern design can be explored by adjusting the parameter variables(Diggle et al., 2000).

For example, the symmetry, rotational symmetry and repetitive units in the bronze mirror pattern can be remodeled through parametric technology to explore the logic and innovation possibilities of its design generation. At the same time, the parametric design method can also be used to explore the re-creation of traditional patterns in modern design, achieve the diversification of patterns by adjusting parameters, and give it new design value while maintaining the traditional cultural heritage.

### 2.9 CONCLUSION OF LITERATURE REVIEW

This chapter systematically summarizes the relevant contents of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China through the sorting and analysis of relevant literature, studies the innovative design concepts and inheritance methods of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, and demonstrates the cultural connotations and artistic characteristics of bronze mirrors in this period.

First, this chapter reviews the bronze mirror culture of the Song, Liao and Jin dynasties, including the historical background and social background, and reveals the diversity of these bronze mirrors in terms of craftsmanship and artistic style through the analysis of the decorative styles of bronze mirrors in different periods. The bronze mirrors of the Song, Liao and Jin dynasties were not only the material carriers of social life at that time, but also reflected rich cultural symbolic meanings.

Secondly, this chapter analyzes the economic value, cultural value and design value of bronze mirrors in the Song, Liao and Jin dynasties. Based on the auction data of bronze mirrors, the main factors affecting the price of bronze mirrors are explored, and the unique value of bronze mirrors is deeply explored from the perspective of culture and design. Bronze mirrors not only have practical and decorative functions, but are also a symbol of Chinese civilization, showing rich cultural connotations and exquisite artistic design.

Thirdly, this chapter also discusses the religious and philosophical thoughts contained in the decorative patterns of bronze mirrors, and analyzes the embodiment of Taoist and Buddhist culture in bronze mirror decoration. The religious and philosophical concepts in the bronze mirror patterns not only enriched the material functions of the bronze mirrors, but also endowed them with profound spiritual symbols. These religious elements enhanced the artistic expression of the bronze mirrors, making them transcend simple practical objects in symbolic meaning.

In addition, this chapter classified and studied the decorative patterns of bronze mirrors unearthed in Datong City during the Song, Liao and Jin Dynasties, and classified their patterns into four types: animals, flowers and birds, character stories and inscriptions. It further systematically analyzed them from the perspective of composition and layout, and summarized the composition forms such as symmetry, radiation, rotation, full flower, single and balanced, showing the artistic diversity of the bronze mirror patterns of the Song, Liao and Jin Dynasties.

Through the analysis of the characteristics of the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties, this chapter summarizes its five major characteristics: practicality, universality, diversity, decorativeness and metaphor. These characteristics provide a new perspective for the study of bronze mirror art. This chapter also reveals the influence of bronze mirror decoration in the Song, Liao and Jin Dynasties on the later generations, especially on the bronze mirror decorative pattern art in Goryeo, Japan, Indonesia and Southeast Asia.

Next, this chapter discusses the application of bronze mirror decorative patterns in the field of modern art design, especially case analysis in logo design, jewelry design and cultural and creative design. This shows that the bronze mirror patterns of the Song, Liao and Jin dynasties are not only a historical legacy, but also provide modern designers with rich inspiration and innovative possibilities.

Finally, this chapter reviews the relevant theories and concepts used in the study, including shape grammar theory, rubbing art concept, semiotics theory and parametric design theory. These theories provide a theoretical basis for interpreting and

understanding the design and research of bronze mirror decorative patterns in the Song, Liao and Jin dynasties.

In summary, this chapter provides theoretical research and support for subsequent research through the systematic sorting and analysis of the above contents, and also provides important references for the practice of modern art design, while laying the foundation for subsequent research.



## CHAPTER 3

### RESEARCH METHODOLOGY

In researching the innovative design and inheritance of bronze mirror decorative patterns during the Song, Liao and Jin dynasties, the researchers used a combination of qualitative and quantitative methods, including literature research, comparative analysis, field observation, questionnaire survey, design practice and expert consultation. The researchers extracted the basic shapes of bronze mirror patterns, combined with graphic thinking, and used shape grammar to create innovative pattern designs that conform to modern aesthetics. This study not only provides new theoretical ideas for the innovative design of Chinese traditional culture, but also aims to promote traditional art and culture and promote the inheritance of Chinese cultural heritage.

The research process follows the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties. First, through the literature research method, the researchers fully grasp the aesthetic foundation and conceptual theory of graphic design, and combine the aesthetic connotations expressed by the bronze mirrors in the Song, Liao and Jin dynasties to preliminarily extract the pattern elements and form a graphic symbol system. The researchers systematically summarize and analyze the historical background, geographical location, decorative composition, layout, classification, meaning and value of the bronze mirrors in this period, laying a solid theoretical foundation for subsequent design.

Secondly, through field observation and research, the researchers visited the bronze mirror exhibition area of the museum, recorded and summarized the representative types of bronze mirrors from the Song, Liao and Jin dynasties unearthed in Datong City, conducted detailed classification and image data collection, selected representative bronze mirrors for in-depth analysis, and studied their main patterns, auxiliary patterns, pattern meaning, national characteristics and their relationship with Chinese religion. At the same time, the researchers also analyzed the influence of Chinese bronze mirror decorative patterns on neighboring countries such as Goryeo, Japan, and Indonesia, and summarized their application examples in modern logo design, jewelry design, and cultural and creative design.

Finally, in the design practice phase, the researchers used the shape grammar design method to carry out innovative research based on the previous analysis of bronze mirror patterns. This method includes three parts: 1) Pattern research: In-depth discussion of traditional patterns and related cultural backgrounds, locking in target patterns that are representative and can reflect specific cultural characteristics, and analyzing their themes, composition rules, skeleton forms and element organization methods. 2) Shape evolution: Use the rules of shape grammar to evolve the target pattern, generate basic graphic units, and derive them to obtain a variety of innovative pattern elements. 3) Scheme generation: Screen the derived various pattern elements,

and based on the design grammar, rationally organize and reconstruct these elements to generate new pattern design schemes.

After the design was completed, the researchers displayed these innovative patterns of bronze mirrors in the form of art exhibitions, interacted with the audience, and summarized the feedback data. The figure below is a mind map of the research method that the researchers explored through studying relevant literature, analyzing research methods, and establishing research tools.

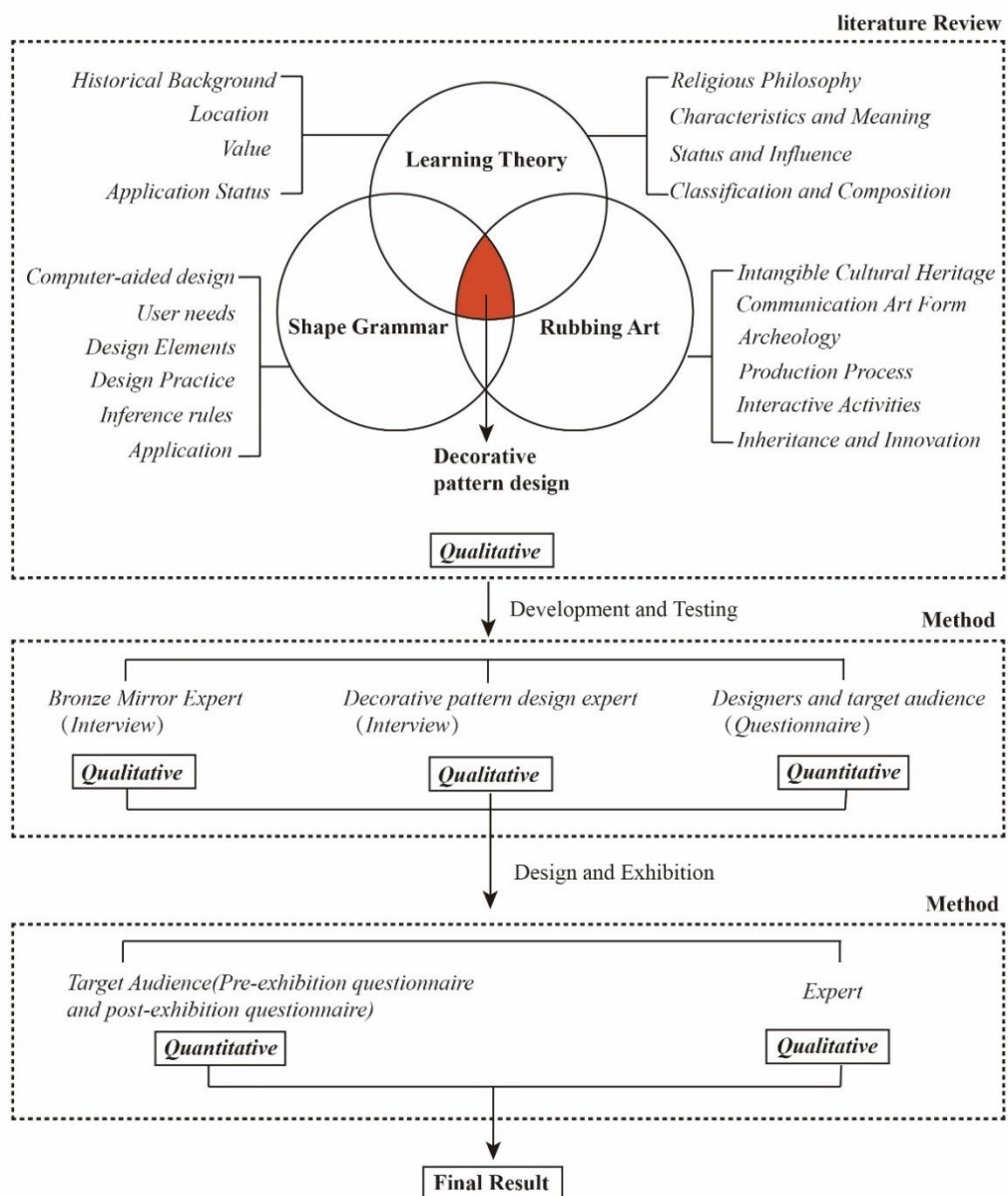


Figure 56 Research methods mind map

Note. Draw by the author,2024

### 3.1 RESEARCH METHODS AND STRATEGIES

#### 3.1.1 LITERATURE ANALYSIS METHOD

This research conducted a comprehensive analysis of the decorative patterns of Chinese bronze mirrors during the Song, Liao and Jin dynasties through a systematic literature analysis method. First, the researchers widely collected literature and picture materials related to the decorative patterns of bronze mirrors during this period through various channels such as the Internet and libraries, and conducted in-depth analysis and summary of the theoretical viewpoints therein. These literature sources include both digital academic resources and books on the history of Chinese bronze mirrors and their decorative patterns. In order to ensure the depth and breadth of the research, the researchers also purchased and consulted a number of paper-based books, conducted detailed reading and investigation, and strived to have a deeper understanding of the evolution of bronze mirror decorative patterns and their cultural significance.

On this basis, the researchers not only sorted out the artistic characteristics and historical background of bronze mirror patterns during the Song, Liao and Jin dynasties, but also revealed the inheritance and development of Chinese bronze mirror art by comparing bronze mirror decorations in different historical periods. In particular, through a detailed study and verification of the classification of bronze mirror patterns, the accuracy of the classification of bronze mirror patterns in terms of form, structure and meaning was further demonstrated. In this process, the researchers also combined the relationship between foreign bronze mirrors and Chinese bronze mirrors, and explored the mutual influence between different cultures, so as to make the understanding of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China more comprehensive (Heaton, 2008).

The application of literature analysis method provides a solid theoretical basis for this study. Through the comprehensive analysis of relevant domestic and foreign literature, the researchers not only mastered the multi-dimensional interpretation of bronze mirror decorative patterns in history, culture and aesthetics, but also provided rich theoretical support and framework basis for subsequent research, which helps to ensure the academic and cultural inheritance of innovative design.

#### 3.1.2 FIELD OBSERVATION METHOD

The distinctive feature of the field observation method is the observer's purposeful and planned conscious cognitive activities. It is an observation activity carried out using two types of observation tools. These two types of observation tools are: 1) Human sensory organs, the most important of which are visual organs-Eye. 2) Scientific observation tools, such as cameras, video cameras, telescopes, microscopes, tape recorders, observation forms, observation cards.

The observation process is a positive and active reflection process, and its object of observation should be social phenomena in a natural state. The practical observation method is one of the important research methods for this research topic. Only through on-site observation in the museum can we see the true appearance of the decorative patterns of ancient Chinese bronze mirrors. This is more intuitive than the pictures in books and online. Using unstructured observation, that is, open observation, a large amount of data can be collected, including a wealth of photos, videos, etc., and the recorded text is often mainly descriptive(Raitz, 2001).

The observation method first needs to clarify the purpose, and then prepare for the observation, including the observation object, observation method, equipment to be used, etc. For example, when observing the decorative patterns of bronze mirrors in the Liao, Jin, and Yuan Ethnic Fusion Museum in Datong City, Shanxi Province, China, the researcher follows the following steps: When observing, first determine the observation frame, secondly observe the environment in which the bronze mirror is seen, and discover and search for information that may be relevant during the observation process. During the observation process, look, listen, ask, think, and remember are combined(Hawkins, 2014).

This research adheres to the principle of combining theory and practice. The researchers used direct observation methods, collected data and information through field observation cards, and took physical photos of the bronze mirrors in the exhibition area. These photos, combined with field observation tools, enabled the researchers to gain a deeper understanding of the decorative patterns of the bronze mirrors unearthed in Datong City during the Song, Liao and Jin Dynasties, which will be used in subsequent research.

### 3.1.3 QUESTIONNAIRE SURVEY METHOD

The carriers of questionnaire surveys are divided into paper questionnaires and electronic network questionnaires. In addition to paper questionnaires, this study also chooses electronic questionnaires using network technology to design and organize surveys. Nowadays, the online questionnaire method is a more suitable questionnaire method for questionnaire surveys, breaking the limitations of traditional passive survey methods in equipment, time and environment. Respondents can participate in the survey anytime and anywhere using mobile terminal devices they carry with them, greatly reducing the resistance and cost of the respondents to participate in the survey, and can effectively utilize the fragmented time of the respondents(Galesic & Bosnjak, 2009).

This research will design a structured questionnaire to collect quantitative data from different audiences, including local young people, students, experts, collectors, museum staff and tourists. The researchers designed the following three questionnaires:

Questionnaire 1: Questionnaire on the recognition of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties

Questionnaire 2: Questionnaire on satisfaction with existing artworks of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties

Questionnaire 3: Questionnaire on the expert on the innovative design of decorative patterns on bronze mirrors during the Song, Liao and Jin Dynasties

In the research, the researchers used a combination of on-site questionnaires and online questionnaires to analyze the collected data, determine the research trends and pattern selection based on the answers to Questionnaire 1, and conduct targeted design based on the data from Questionnaire 2 to make the design more in line with the public's aesthetic wishes. The on-site survey was conducted at the Liao, Jin and Yuan National Fusion Museum in Datong, Shanxi, China, focusing on searching for samples of foreign tourists and local people in the area, and it is expected to collect 50 questionnaires. The online survey was conducted through an electronic questionnaire platform link, and it is expected to collect 350 questionnaires. Finally, all the collected data were analyzed and counted.

### 3.1.4 COMPARATIVE RESEARCH METHOD

Comparative research is a method of studying and judging the similarities or differences between objects and between people. Comparative research can be understood as a method of investigating two or more related things according to certain standards, finding their similarities and differences, and exploring general and special laws (Ndebele-Murisa et al., 2021).

This research will compare and analyze the similarities or differences between the selected traditional bronze mirror decorative patterns and the innovatively designed new bronze mirror decorative patterns, study and judge the similarities and differences in their composition, categories, and cultural connotations, and explore the methods of general and special laws.

According to the difference in time, the researchers conducted horizontal and vertical comparisons. By comparing the decorative patterns of Chinese bronze mirrors in different time stages of various historical periods, we can understand the laws of changes and development of bronze mirror decorative patterns, analyze the stages and trends of the development of bronze mirror decorative patterns, better understand the past and grasp the future, and carry out modern innovative design.

According to the direction of the goal, we conduct similarity comparison and difference comparison. Analyze and compare the structural elements, composition layout, and classification standards of bronze mirror decorative patterns, summarize and generalize the similarities and relevance of different bronze mirror decorative patterns, and reveal the reasons for the differences.

### 3.1.5 COMBINATION OF QUALITATIVE ANALYSIS METHOD AND QUANTITATIVE ANALYSIS METHOD RESEARCH

This research will use qualitative research to obtain information materials by participating in field investigations. From the cases of some decorative pattern documents to the overall decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China, an overall concept is formed. The researchers take the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties as the starting point to summarize the composition characteristics and classification rules of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties.

This research will also combine the observation card data and the data obtained from the questionnaire survey for quantitative analysis. And the design method of this study is shape grammar, which will calculate the formula of graphic patterns, combine computational linguistics, conduct quantitative analysis and research, and obtain the innovative design pattern form of bronze mirrors.

Quantitative research and qualitative research each have their own unique characteristics, advantages and limitations. But the two are not mutually exclusive, but to some extent they are interrelated and even complementary. Because quality and quantity are two sides of things, only by organically combining the two can we better study this thing.

### 3.1.6 DESIGN PRACTICE

In the learning and research method based on design practice, the importance of design practice and theory is emphasized, and neither of them can be missing. Theory is the guide of practice. Theory guides design practice, and design practice verifies the truth and fallacy of theory. Reorganizing and summarizing the results of verification returns to theory. From this logic, theory and practice are mutually reinforcing and mutually reinforcing (Cherkasky, 2004).

The research model of this study will adopt a practice-based approach. The first phase involves researching the theory and content, as well as analyzing the graphic design of bronze mirror decorative patterns from the Song, Liao, and Jin periods in China. Based on data results regarding the target population's awareness of these decorative patterns and satisfaction with related artwork designs, further research and design planning will be conducted to address issues identified in the survey. The targeted design will focus on innovative bronze mirror decorative patterns from the Song, Liao, and Jin periods to promote local culture and art. In the second phase, the design method of shape grammar will be applied to carry out design practice, which will then be combined with the art form of rubbing to facilitate communication and interaction, displaying the final results. The researcher will employ the following design practice methods:

1) Talk and do, combining talk and practice: In design learning, talk and do, and transform timely theories into design practice.

2) Find problems in practice and return to theory to find answers: In design learning practice, many problems are often found, and there are many reasons for the problems. If you return to theory to find answers, many problems will be solved.

3) Review and evaluate design practice works with reference to theory: Design works are the practical results of design. How to evaluate design works is obviously incomplete if it only refers to whether it has been applied. The internal relationship, aesthetic level, accuracy of information transmission and applicability of design works need to be measured and evaluated with reference to theory and data feedback of design results.

### 3.1.7 EXPERT CONSULTATION METHOD

Expert consultation is a qualitative research method that invites experts in the field of decorative patterns and graphic design to conduct multiple rounds of consultation and feedback, obtain in-depth insights and guidance, and gradually reach a consensus (Fraussen et al., 2020). This research method is suitable for exploring and analyzing the innovative design and inheritance of decorative patterns on bronze mirrors in the Song, Liao and Jin dynasties. It is mainly divided into the following four steps:

#### 1) Determine the expert group

First, professors or senior designers who have in-depth research in the fields of decorative patterns, cultural relics protection, graphic design and design studies are selected as members of the expert group. In order to ensure diversity and representativeness, multiple experts from different backgrounds such as museums, universities, and design institutions are selected.

#### 2) Question design

The interview outline revolves around the historical value, cultural symbols, compositional features, operability in graphic design, and innovation and inheritance of the decorative patterns of Song, Liao and Jin bronze mirrors. Question 1: How to inherit and carry forward these historical patterns in modern design? Question 2: What cultural symbols should be preserved or improved in these patterns in contemporary design?

#### 3) Multiple rounds of consultation

The first round of consultation: Send open-ended questionnaires to experts to collect their ideas and suggestions on the innovative design of decorative patterns on bronze mirrors in the Song, Liao and Jin dynasties. Experts can express their opinions freely, and the focus is on obtaining a wide range of different views and suggestions. Second round of consultation: Based on the results of the first round, common opinions and differences are sorted out and summarized, and then closed or semi-open questions are formed and sent to experts again. The purpose of this round is to further

focus and ensure that experts have clearer feedback on key issues. Third round and subsequent rounds: If necessary, the third round and above of consultation can be continued to eliminate differences and reach consensus, especially for some innovative pattern design issues.

#### 4) Data analysis and summary

Collect and analyze the results of multiple rounds of consultation, focusing on the consensus and differences reached among experts. Through quantitative statistics of experts' recognition of specific design issues, combined with qualitative analysis, the innovative design and inheritance of decorative patterns of Song Liao Jin bronze mirrors are discussed.

Expert consultation is the key to solving complex design problems and obtaining professional knowledge. Researchers must carefully select experts who are suitable for the research field and situation, and record the consultation process in detail, including experts' remarks and opinions, and communication points. Researchers can learn about the latest design trends, technological innovations, design practice experience and other information through communication and interaction with experts. The expert consultation method will gather the wisdom of multiple experts in the field to form a systematic theoretical framework, which will not only help solve the key problems in this study, but also provide practical design references for this study and provide theoretical and design guidance for subsequent research work.

### 3.2 SAMPLE SELECTION CRITERIA

#### 3.2.1 SAMPLE SIZE OF LOCALS AND TOURISTS IN DATONG, SHANXI PROVINCE, CHINA

This research aims to investigate the cognition and attitude of local residents and tourists in Datong City, Shanxi Province towards the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, and to provide data support for the future research on the innovative design of modern decorative patterns in China. The researchers conducted a questionnaire survey in Datong City in April 2024. This study uses a simple random sampling sample size (Di Tillio et al., 2021). The questionnaire surveyed respondents of different genders, ages and educational backgrounds.

First, the overall sample population studied by the author is the locals and tourists in Datong City, Shanxi Province in 2024. Because the overall population size is known, the total number of samples in 2024 is 572,261, and the Shan Gen formula for determining the sample size is as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where  $n$  = corrected sample size,  $N$  = population size,  $e = 0.05$ .

Sample size  $n = N / (1 + N * (e^2))$

$$=572261 / (1+572261*(0.05)^2)$$

$$=399.72$$

Therefore, the sample size is 400 samples.

A total of 400 questionnaires were distributed in this research. The respondents included local residents and tourists, including designers, college students majoring in design, researchers, archaeologists, and tourists interested in the design of bronze mirror decoration patterns, ensuring that the sample is extensive and representative.

### 3.2.2 EXPERTS

This research conducted in-depth interviews with five industry experts, including a university professor of design, a design company director, and the inheritor of the national intangible cultural heritage Datong bronze making skills.

- 1) In-depth interview with Gao Yuhong, Dean of the School of Art and Design of Communication University of Shanxi and Professor of Design
- 2) In-depth interview with Cao Yu, Vice Dean of the School of Art and Design of Communication University of Shanxi and Associate Professor of Design
- 3) In-depth interview with Shi Tong, Professor of Visual Communication Design of the School of Art and Design of Communication University of Shanxi
- 4) In-depth interview with Gao Peng, Associate Professor of Visual Communication Design of the School of Art and Design of Communication University of Shanxi and Design Director of Shanxi Juexi Cultural Communication Co., Ltd.
- 5) In-depth interview with Li Anmin, inheritor of the national intangible cultural heritage Datong bronzeware making skills

### 3.2.3 FIELD OBSERVATION LOCATIONS

The researcher conducted field investigations at exhibitions related to the study of bronze mirror decorative patterns. The specific locations are as follows:

- 1) Visited the bronze mirror exhibition area of the Liao, Jin and Yuan National Integration Museum in Datong, Shanxi Province, China
- 2) Visited the bronze exhibition area of the Datong Museum in Shanxi Province, China
- 3) Visited the bronze art exhibition of the Shanxi Bronze Museum in China
- 4) Visited the Ancient Chinese Bronze Mirror Culture Exhibition at the National Museum of China
- 5) Visited the Ancient Chinese Bronze Mirror Culture and Art Exhibition at the Tsinghua University Art Museum

### 3.2.4 FOCUS GROUP

The purpose of the focus group interview is to deeply explore the inheritance and innovation methods of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in modern design, and to understand the participants' views on the topic of this study. Through collective discussion, the participants' suggestions and innovative design expectations for representative bronze mirror decorative patterns are analyzed to provide reference for the design practice of this research.

Workshop team members will be selected based on the following criteria: 1) Professional background: including designers, PhD students in design, university professors, and inheritors of intangible cultural heritage bronze craftsmanship. 2) Age and gender: The age range of participants ranges from 20 to 45 years old, ensuring representation of different age groups. 3) Group size: Each group will have 5 people, and 3 focus group interviews are expected to be conducted to ensure diversity and depth of discussion.

The interview will be conducted strictly according to the prepared process. The researchers will prepare open questions covering the participants' understanding of the cultural implications of bronze mirror patterns, the experts and members' suggestions on the methods of bronze mirror decorative pattern design, and use relevant pictures as auxiliary materials to guide the discussion. The interview will focus on the representativeness of bronze mirror patterns, the aesthetics of traditional patterns in modern design, and the possibility of innovative design. By recording key information in shorthand, the data analysis will use the key issue analysis method to extract the consensus and disagreement of the participants, with special attention to their suggestions on representative selection of bronze mirrors and suggestions on design element extraction.

The privacy of the participants will be strictly protected during the research process, and the data will only be used for academic research. This research method will ultimately provide theoretical support and practical guidance for the modern design inheritance and innovation of bronze mirror decorative patterns in the Song, Liao and Jin dynasties.

## 3.3 RESEARCH TOOLS

### 3.3.1 LITERATURE MANAGEMENT TOOLS

EndNote was selected as the document management tool for this research, which was used to systematically manage and cite documents. Through this tool, researchers can efficiently organize various types of literature, ensure the accuracy of document citations, and help clarify the context of the research in the literature review. The document management tool also facilitates the classification, annotation and rapid

retrieval of different documents, and facilitates in-depth analysis of research results related to bronze mirror decorative patterns.

### 3.3.2 DATA ANALYSIS SOFTWARE

The selection of Microsoft Excel and SPSS as data analysis software is crucial for processing questionnaire survey data for quantitative research. The software facilitates statistical analysis, percentage analysis, and correlation tests on the collected questionnaire data, helping researchers to understand the public and professionals' cognition and acceptance of the innovative design of decorative patterns on Song and Liao Jin bronze mirrors from a quantitative perspective. Data analysis software can improve the accuracy and efficiency of research.

### 3.3.3 IMAGE PROCESSING AND DESIGN TOOLS

In the process of field observation and pattern design, researchers need to record the details of bronze mirror decorative patterns. Adobe Photoshop, Adobe Illustrator and CorelDRAW are selected as image processing and analysis tools to help researchers carefully process the composition and element extraction of bronze mirror decorative patterns. Through these tools, researchers quantitatively analyze the morphology, proportion, symmetry and other characteristics of bronze mirror patterns, so as to better understand their design logic and artistic characteristics.

### 3.3.4 INTERNET RESOURCES AND DATABASES

Researchers need to visit academic databases and professional websites to collect relevant information. CNKI, Wanfang Data, JSTOR and SCOPUS databases provide a large number of academic papers, journals and conference materials. Researchers can search for relevant literature and research results by keywords to obtain the latest research trends. In addition, museum databases and cultural relics and archaeological databases, such as the National Museum's collection database, provide physical images of bronze mirrors and detailed unearthed background information, helping researchers to have a deeper understanding of the historical and cultural background of bronze mirrors.

### 3.3.5 QUESTIONNAIRE DESIGN AND SURVEY TOOLS

As a tool for designing and distributing questionnaires, this research selected SOJUMP and Tencent Questionnaire online survey platforms to help researchers design scientific questionnaires and facilitate data collection and organization. Through this tool, questionnaires can be widely distributed to different groups to obtain diverse feedback, and the data organization and analysis process can be automated to improve research efficiency.

### 3.4 DATA COLLECTION

#### 3.4.1 DATA COLLECTION METHODS AND PROCESS OF LITERATURE REVIEW

Literature review is the basis of research work. Through systematic organization and analysis of existing results, the current status, trends and problems to be solved of the research topic are clarified. In the study of innovative design of decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, the literature review method provides researchers with extensive historical, cultural and artistic background support. The literature review method integrates multi-channel resources to lay a solid theoretical foundation for innovative research on decorative pattern design of bronze mirrors in the Song, Liao and Jin dynasties.

##### 1) Utilization of Library Resources

Researchers obtain books, journals and academic papers related to decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties through school and municipal libraries. This type of literature covers archaeological reports, physical pictures and cultural background analysis of bronze mirrors, especially unearthed reports and collection catalogs, which provide materials for researchers to deeply understand the style of bronze mirror patterns.

##### 2) Academic Database Retrieval

Researchers use academic databases such as CNKI, Wanfang Data, JSTOR, and SCOPUS databases, to search for keywords such as "Song, Liao and Jin bronze mirrors", "decorative patterns of bronze mirrors", "innovation in ancient bronze mirror design", etc., to obtain relevant latest research, especially papers on innovative design, and enrich research content from different perspectives.

##### 3) Professional Databases and Journals

Using professional databases such as the Chinese Art Research Database and the Museum Collection Database, researchers can access unpublished physical data of bronze mirrors, including the excavation background, material analysis to provide a basis for physical analysis and innovative design research.

#### 3.4.2 DATA COLLECTION METHOD AND PROCESS OF QUESTIONNAIRE SURVEY

The questionnaire survey method is a quantitative research method. Through questionnaire design and analysis, the respondents' cognition and attitude towards the innovative design of decorative patterns of Song, Liao and Jin bronze mirrors are collected to provide data support. The analysis results reveal the respondents' aesthetic trends and acceptance of innovative designs of Song, Liao and Jin bronze mirror

patterns, helping researchers find the entry point for innovative design of bronze mirror patterns in theory and practice.

#### 1) Questionnaire Design

The questionnaire should cover aspects such as bronze mirror pattern cognition, aesthetic preferences, and acceptance of innovative designs, and use closed and open questions to facilitate quantitative analysis and obtain personalized insights.

#### 2) Data Collection Channels

The questionnaire can be distributed in paper or electronic form. Paper questionnaires are suitable for museums and exhibition venues, which facilitate face-to-face communication; electronic questionnaires are distributed through online tools, covering a wide range of groups and reducing costs.

### 3.4.3 DATA COLLECTION METHODS AND PROCESSES OF FIELD OBSERVATION

The field observation method obtains first-hand data through field recording, shooting and observation, and combines questionnaires and observation record cards to analyze the design innovation of the decorative patterns of Song, Liao and Jin bronze mirrors. Through the field observation method, researchers can obtain rich first-hand data, combined with multi-dimensional analysis, to provide a solid empirical basis for the innovative research of the decorative patterns of Song, Liao and Jin bronze mirrors.

#### 1) On-site Preparation

The researcher selects a representative museum or exhibition, prepares observation record cards and shooting equipment to ensure that the details and cultural background of the bronze mirror pattern design are fully recorded.

#### 2) Field Observation and Data Collection

The pattern, style and cultural symbol of the bronze mirror pattern are recorded through photos and videos. Visual observation combined with record cards helps researchers establish a comprehensive understanding of bronze mirror decoration.

#### 3) Combination of Questionnaires and Interviews

The on-site combination of questionnaires and interviews obtains visitors, curators and experts' cognition and opinions on the innovation of bronze mirror patterns, especially their insights into modern design applications.

### 3.4.4 DATA COLLECTION METHODS AND PROCESS OF COMPARATIVE RESEARCH

When research the innovative design and inheritance of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, researchers can find the path of design innovation by comparing the decorative patterns of bronze mirrors in different historical periods and cultural regions.

#### 1) Collection of Research Object

The researchers selected representative bronze mirrors from the Song, Liao and Jin dynasties as comparison objects to ensure the diversity and representativeness of the samples. The evolution of bronze mirror patterns in various periods in China was compared vertically, and the cultural differences between regions were analyzed horizontally.

#### 2) Setting of Comparison Dimensions

Decorative pattern design: such as the composition and layout of bronze mirrors of flowers, animals, characters, stories and inscriptions.

Cultural connotation: the symbolic meaning of patterns under different cultural backgrounds.

Regional style differences: analyze the differences in pattern styles in different regions and the influence of cultural exchanges.

### 3.4.5 DATA COLLECTION METHODS AND PROCESS OF EXPERT

#### CONSULTATION

In the research of the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, the expert consultation method helps to obtain authoritative views on the artistic design, historical and cultural heritage of bronze mirror decorative patterns. It provides rich academic and practical references for the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, and helps researchers deepen their understanding of pattern design from multiple perspectives.

#### 1) Design Consultation Questions

For the study of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, the researchers designed a structured list of questions covering multiple fields. Through open questions, the researchers obtained experts' in-depth analysis of the cultural significance of pattern design.

#### 2) Choice of Consultation Method

Expert consultation methods include face-to-face interviews, telephone interviews or online meetings. Face-to-face interviews can communicate deeply with experts and help obtain detailed feedback; online meetings or email consultations are suitable for long-distance expert consultations, saving time and cost.

### 3.5 DATA ANALYSIS

1) Analysis of literature data: Through the screening and analysis of literature, researchers should focus on the extraction of innovative design elements of bronze mirror patterns, the composition of patterns, the classification of patterns, and cultural connotations. By comparing different literature viewpoints, the problems that need to

be solved are identified, laying the foundation for subsequent empirical research or theoretical innovation.

2) Data analysis of questionnaire survey: After the questionnaires are collected, researchers need to collate and analyze the data. First, researchers enter the data of the paper questionnaire to ensure that the data format of the paper questionnaire and the electronic questionnaire is consistent. Then, use statistical software or online tools to process the data. For closed-ended questions, researchers can use percentage analysis to quantify the respondents' attitudes towards different design elements. For open-ended questions, researchers need to use content analysis to extract the respondents' key views and identify common opinion patterns or unique insights.

Through data analysis, researchers can find out the respondents' mainstream aesthetic tendencies towards the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, their acceptance of innovative designs, and the possibility of applying these traditional patterns in modern design. These data can not only provide a basis for theoretical research, but also provide practical design suggestions for modern bronze mirror design.

3) Data analysis of field observation method: The researchers integrated photos, observation record cards and questionnaire survey data results to form a complete data set. In the data analysis stage, the researchers combined the qualitative data from the observation record cards with the quantitative data from the questionnaire survey. Through multi-dimensional analysis of field observation data and questionnaire survey results, the researchers can explore the innovative path of bronze mirror decorative patterns in the Song, Liao and Jin dynasties from the perspectives of history, culture and design, provide multi-level research support for the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, and provide reference for modern design.

4) Data analysis of comparative research method: The researchers compared the collected data horizontally and vertically to reveal the design characteristics and innovation trends of bronze mirror patterns in different periods. By comparing the patterns of different regions or dynasties, the researchers analyzed their evolution and innovation paths. Through comparative research, the evolution trend and innovation model of bronze mirror decorative patterns in the Song, Liao and Jin dynasties were revealed. These findings not only help to understand the inheritance of traditional design, but also provide reference for modern bronze mirror design.

5) Data analysis of expert consultation method: After the expert consultation is completed, the researcher organizes and analyzes the opinions of the experts and extracts the core content related to the research topic. During the analysis process, the researcher integrates the opinions of different experts through induction and classification, identifies key issues with consensus, and pays attention to the different views of experts on pattern design innovation to enrich the research perspective.

Through the opinions and suggestions of experts, the researcher improves the research framework in the data analysis process, especially the theoretical

construction of innovative design of bronze mirror decorative patterns. The feedback of experts can provide authoritative support for the theoretical research of innovative design, and also provide specific guidance for design application in practice.

### 3.6 CONCLUSION OF RESEARCH METHODS

This research adopts a mixed research method, comprehensively using literature analysis, field observation, questionnaire survey, comparative study, expert consultation, focus group discussion and design practice, etc., organically combining different methods, integrating qualitative and quantitative research, and comprehensively promoting the innovative design research of bronze mirror decorative patterns in the Song, Liao and Jin dynasties at the theoretical and practical levels.

This research method can be divided into four phases.

Phase 1: qualitative research, using literature analysis and comparative research methods to collect and analyze relevant data of the research, fully understand the background and content of the research topic, and provide a solid empirical basis for the innovative research of bronze mirror decorative patterns in the Song, Liao and Jin dynasties.

Phase 2: Qualitative research is combined with quantitative research, and the research methods of field observation and questionnaire survey are used, among which field observation method is qualitative research, and questionnaire survey data is quantitative research. Data are collected from the target population through field observation cards, Questionnaire 1 and Questionnaire 2, and the data from the awareness questionnaire of decorative patterns on bronze mirrors in the Song, Liao and Jin Dynasties and the satisfaction questionnaire of the pattern design of related artworks with decorative patterns on bronze mirrors in the Song, Liao and Jin Dynasties are analyzed. The analysis results reveal the respondents' acceptance of the aesthetic trends and innovative designs of bronze mirror patterns in the Song, Liao and Jin Dynasties, helping researchers find the entry point for innovative design of bronze mirror patterns in theory and practice.

Phase 3: qualitative research is combined with quantitative research, using questionnaire survey method, focus group and expert consultation method for in-depth interviews, collecting and discussing data from target groups such as experts and bronze ware inheritors through questionnaire 1, questionnaire 2 and questionnaire 3, and analyzing the data results to identify key issues with consensus, and at the same time pay attention to the different views of experts on the design innovation of bronze mirror patterns in the Song, Liao and Jin Dynasties to enrich the research perspective.

Phase 4: Qualitative research, using the methods of design practice and exhibition activities. Design practice 1 is the innovative pattern design of the representative bronze mirror decorative patterns in the Song, Liao and Jin dynasties. It combines the design method of shape grammar and carries out design practice according to the graphic design formula of shape grammar. Design practice 2 is the

modern bronze mirror carving art pattern. According to the design results of design practice 1, the practice of artworks is carried out. In addition, the researchers also combined the results of the above two design practices with the rubbing art of national intangible cultural heritage to carry out exhibition activities, aiming to provide new ideas for the innovative design of Chinese decorative pattern art and the promotion and inheritance of Chinese culture and art. The figure below is the conceptual framework diagram of the research method in this chapter.

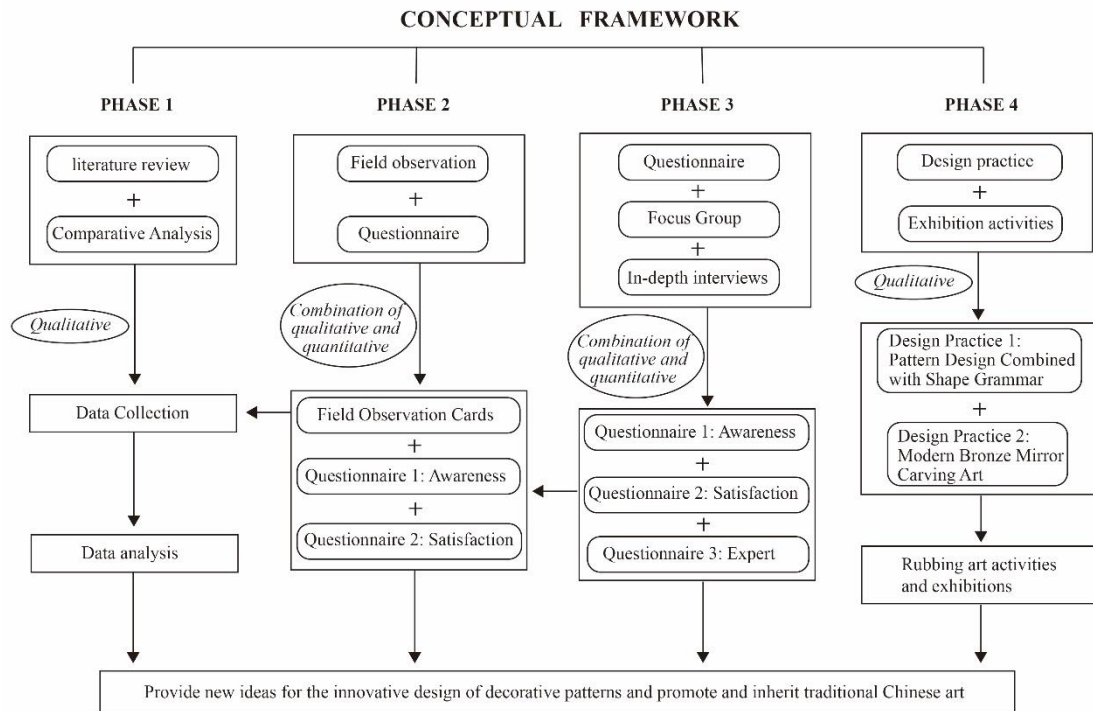


Figure 57 *Conceptual framework of research methods*  
 Note. Draw by the author, 2024

## CHAPTER 4

### RESEARCH PROCESS AND RESULTS

This chapter aims to systematically explain the research process and results of the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China. Through questionnaire surveys, field and expert surveys, and practical research in art workshops, combined with innovative design based on shape grammar, this study strives to build an effective bridge between theory and practice. The decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties have distinct characteristics of the times. The auspicious patterns that prevailed at this time were closely related to the politics and economy of the time. The various composition skeletons of the patterns in this period have made great progress compared with the previous generations, and many new techniques have been created. This chapter will deeply study the design process of patterns from an artistic perspective, innovate patterns based on the meaning and temperament of traditional patterns, combine the design methods of shape grammar, and deduce the design rules and algorithms of new patterns, reflecting the traditional aesthetic temperament and culture, while providing inspiration and reference for the methods of modern decorative pattern design.

This chapter will focus on organizing and analyzing the key data and information obtained in the survey in Chapters 2 and 3, and show the process and creative results of design practice. In addition, it will also introduce the evaluation of the design results, deeply analyze its academic value, and finally summarize the core issues of the entire research.

The research structure of this chapter is as follows: First, through the collation and analysis of the questionnaire survey data, summarize the understanding and needs of the general public and professional groups on the decorative patterns of Song, Liao and Jin bronze mirrors; second, combine the results of field research and expert interviews to explore the cultural connotation and innovation path of traditional pattern design; third, show the research results based on the shape grammar design method in the art workshop, and explore the innovative practice and theoretical support in the design process; Then, the exhibition of design results, implementation of rubbing activities and social evaluation are presented to test the design effect from multiple dimensions; finally, the research results are summarized and reflected. The figure below is the research steps and conceptual framework of this chapter.

#### CHAPTER 4 RESEARCH STEPS AND CONCEPTUAL FRAMEWORK DIAGRAM

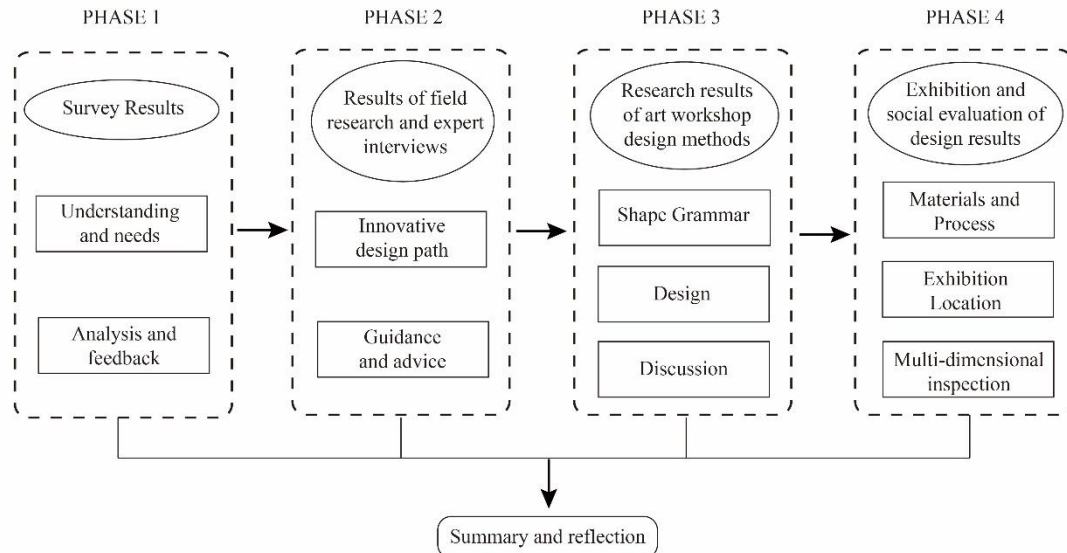


Figure 58 Chapter 4 Research steps and conceptual framework diagram

Note. Draw by the author,2024

## 4.1 RESEARCH STRATEGIES BASED ON DATA ANALYSIS RESULTS

### 4.1.1 ANALYSIS OF QUESTIONNAIRE SURVEY RESULTS

This research focuses on the innovative design of decorative patterns on bronze mirrors during the Song, Liao, and Jin dynasties in China. The bronze mirrors of this period demonstrated the artistic achievements of the time with their exquisite craftsmanship and unique patterns. The researchers used a questionnaire survey method to conduct a questionnaire survey on the general public and experts in related fields in Datong City, Shanxi Province. This section will be divided into the content of the questionnaire survey, sample statistical results, and data research results, supplemented by visual charts to more intuitively display the research results and process.

#### 4.1.1.1 SURVEY CONTENT AND SAMPLE STATISTICS

The geographical location of the survey population chosen by the researcher is Datong City, Shanxi Province, China. As the center of multi-ethnic settlement in northern China during the Song, Liao and Jin Dynasties, Datong City's bronze mirror patterns combine the delicate and soft beauty of the Central Plains culture with the rough and boldness of the grassland people, reflecting the characteristics of the collision and integration of multi-ethnic cultures, and innovating new patterns with distinct regional characteristics.

As one of the nine ancient capitals of China, Datong has a large number of unearthed and collected bronze mirrors, especially the bronze mirrors from the Liao and Jin Dynasties, which are the most local. From flower mirrors, double fish pattern bronze mirrors to character story mirrors, these bronze mirror patterns not only reflect the fusion of multiple cultures, but also show the richness and diversity of people's artistic life. The bronze mirror has gradually evolved from a single practical tool to an artwork that combines aesthetics and practicality. Its development process is a microcosm of social and cultural changes. The systematic sorting and questionnaire survey of bronze mirrors in this period and this region will not only help to reveal the evolution of the art and craftsmanship of bronze mirrors, but also help to understand the ideology and demand of the public in Datong for artwork patterns.

In this research and investigation context, this study designed three questionnaires to deeply analyze the public awareness of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, the satisfaction with the decorative patterns of artworks, and the professional insights of experts on the innovative design methods of decorative patterns. These questionnaires will provide empirical evidence for the protection of traditional Chinese patterns and the innovative design of modern decorative patterns. The following table shows the structural design of the questionnaire survey content.

Table 19 *Questionnaire survey content structure design table*

No.	Questionnaire Name	Target population	Survey location	Main content	Question Type
1)	Questionnaire on the recognition of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties	General public	Datong Liao, Jin and Yuan National Integration Museum	1. Basic information of the respondents 2. Cognition level and interest 3. The source of cognition about bronze mirrors	1. Multiple choice questions 2. Open questions
2)	Satisfaction survey questionnaire on decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties	General public	Datong Liao, Jin and Yuan National Integration Museum, Datong Museum	1. Satisfaction with bronze mirror artworks 2. Degree of need for innovation 3. Direction of innovative design	1. Multiple choice questions 2. Open questions

3)	Expert Questionnaire on Innovative Design of Decorative Patterns on Bronze Mirrors during the Song, Liao and Jin Dynasties	Experts in related fields	Communication University of Shanxi	1. Discussion on innovative design methods 2. Discussion on culture, artistry and representativeness 3. The principle of balance between inheritance and innovation 4. Future research and design suggestions	Open Questions
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*Note.* Author, 2024

These three questionnaires cover a wide range of groups from the general public to experts in related fields, aiming to deeply analyze the modern significance and design methods of bronze mirror decorative patterns from the three levels of design, aesthetics and culture. The research results will provide a scientific basis for the combination of heritage protection and artistic innovation design, and provide a reference for regional cultural development.

This research collects data through the research method of questionnaire survey. Combined with the sample number in Chapter 3, the researchers summarized and collected 400 questionnaires, of which 377 were valid questionnaires. The researchers interviewed 5 experts and scholars. Field investigations were conducted in many places such as the Liao, Jin and Yuan National Integration Museum, Datong Museum and Shanxi Provincial Museum in Datong City, Shanxi Province, China. Design seminars were held in art design workshops. The following figure shows the survey sample information data chart of the local residents and tourists in Datong City on the cognition and attitude of the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin periods in China.

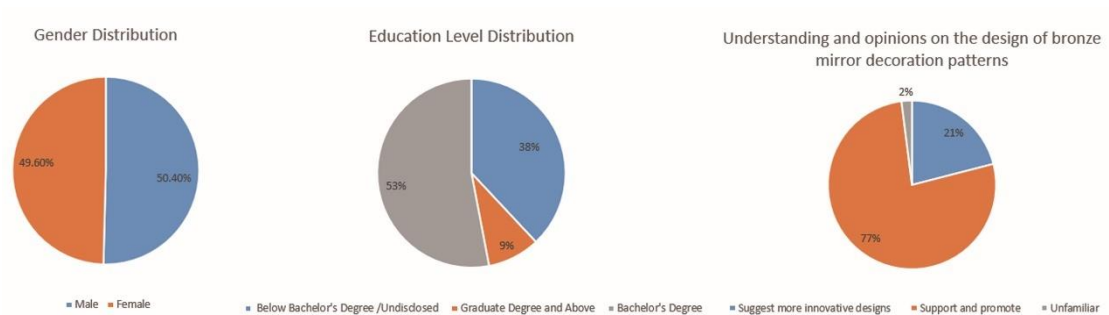


Figure 59 Survey sample information data of cognition and attitude towards decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties

*Note.* Draw by the author, 2024

In terms of gender distribution, 190 males accounted for 50.4%, and 187 females accounted for 49.6%, with a relatively balanced gender ratio. The ages of the respondents ranged from 18 to 65 years old, covering a wide range of ages. In terms of educational background, 53% of the respondents had a bachelor's degree, 9% had a master's degree or above, and 38% had an educational background below undergraduate or were unwilling to disclose educational information. This shows that the respondents generally have a high level of education.

Regarding the cognition and attitude towards the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, 77% of the respondents said that the bronze mirror patterns of this period need to be inherited and carried forward, which is in line with the policy of urban cultural tourism development and reflects the importance of Chinese traditional culture and art in modern society. At the same time, 21% of the respondents suggested designing more artworks with innovative patterns to better promote local traditional culture, showing the respondents' strong demand for innovative design. 2% of the respondents said that they did not know much about the decorative patterns of bronze mirrors, indicating that most respondents had a certain cultural cognition of bronze mirrors in the Song, Liao and Jin dynasties.

The sample data of this quantitative study show that local residents and tourists in Datong generally support the inheritance and innovative research of bronze mirror decorative patterns from the Song, Liao and Jin dynasties in China. They also look forward to promoting the dissemination and development of bronze mirror culture through innovative artistic works, providing support for the city's cultural tourism industry, and providing important theoretical and data support for the future innovative design of modern Chinese decorative patterns.

#### *4.1.1.2 SURVEY RESULTS AND VISUAL ANALYSIS*

The survey results of this research are based on the data and information statistical analysis of Questionnaire 1: Questionnaire on the recognition of decorative patterns on bronze mirrors during the Song, Liao and Jin Dynasties and Questionnaire 2: Questionnaire on satisfaction with existing artworks of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties. The three members of the research team distributed and collected questionnaires in the Datong Liao, Jin and Yuan National Integration Museum and Datong Museum and nearby blocks. The online questionnaire was conducted by sharing the questionnaire link on the SOJUMP online survey platform.

The survey results of this research were analyzed from two aspects: "the public's cognition and satisfaction with traditional bronze mirror patterns" and "the public's demand for innovative designs of bronze mirror decorative patterns".

##### 1) Public cognition and satisfaction with traditional bronze mirror patterns

The analysis of the survey results on the public and tourists in Datong City, Shanxi Province's cognition and satisfaction with traditional bronze mirror decorative patterns mainly comes from Questionnaire 1: The survey results of the questionnaire on the

cognition of bronze mirror decorative patterns during the Song, Liao and Jin Dynasties. According to the statistics of the collected valid questionnaire data, the differences in pattern cognition among respondents from different backgrounds are shown; because the popularity of patterns in some regions and eras is low, it shows the weakness of the dissemination of local bronze mirror culture and art; according to the comparison of the cognition of representative patterns of various dynasties during the Song, Liao and Jin Dynasties, the preferences of regions and eras are shown. The visualized bar chart is as follows:

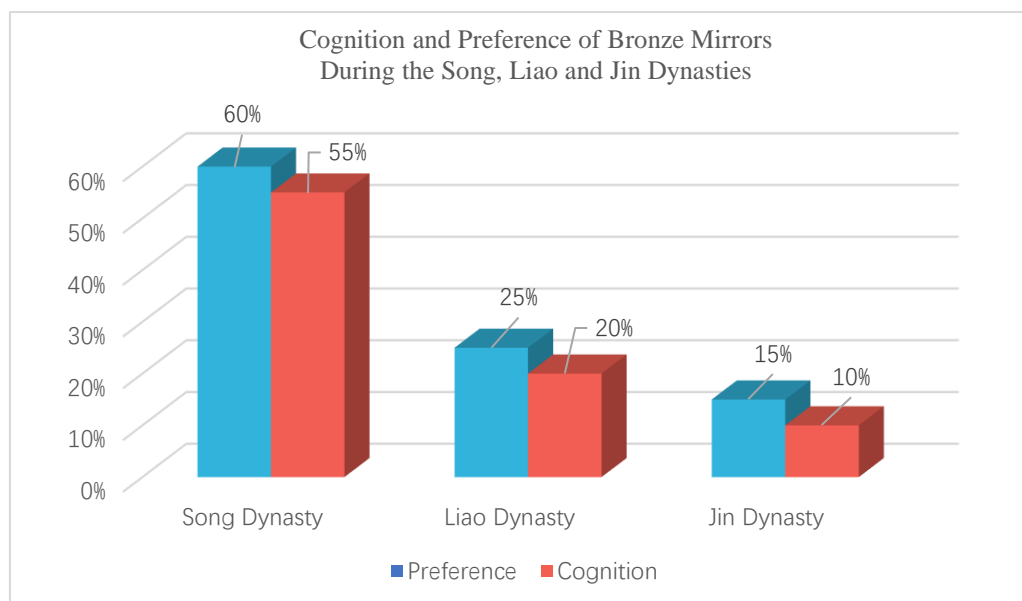


Figure 60 *Cognition and Preference of Bronze Mirrors During the Song, Liao and Jin Dynasties*

Note. Draw by the author, 2024

This bar chart shows the surveyed population's cognition and preference for bronze mirrors from the Song, Liao and Jin dynasties. The blue column in the figure represents "preference" and the red column represents "cognition". It can be clearly seen that: Song Dynasty: preference (60%), high cognition (55%). Liao Dynasty: preference (25%), low cognition (20%). Jin Dynasty: preference (15%), lowest cognition (10%).

According to the visualization bar chart analysis, it can be concluded that: 1) The preference and cognition of the Song Dynasty are significantly higher than those of the Liao and Jin Dynasties. 2) The preference and cognition of the Liao Dynasty are second, but there is a significant gap compared with the Song Dynasty. 3) The preference and cognition of the Jin Dynasty are the lowest, which may be related to the politics, economy, cultural and artistic communication at that time.

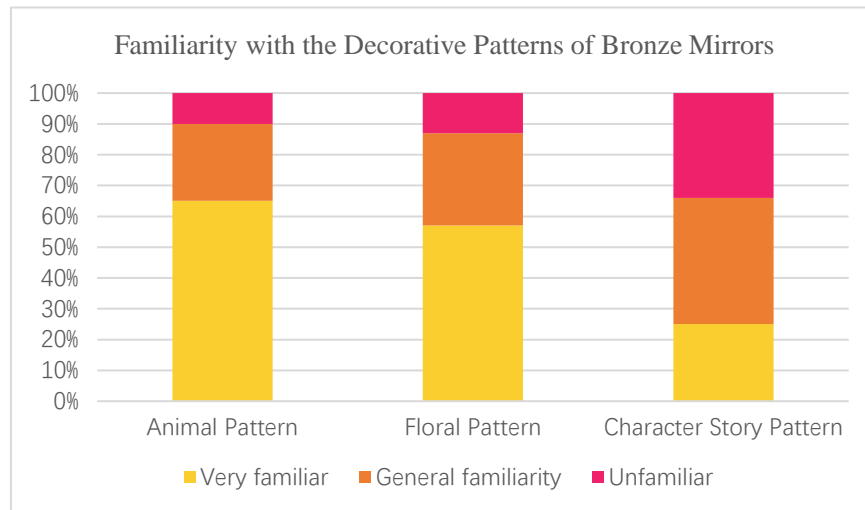


Figure 61 *Familiarity with the Decorative Patterns of Bronze Mirrors*  
 Note. Draw by the author,2024

Figure 66 is a bar chart of the familiarity of decorative patterns on bronze mirrors. The chart shows the familiarity of common decorative patterns on bronze mirrors, and the familiarity of different patterns, that is, the proportion of familiarity of animal patterns, character story patterns, and floral patterns. According to the results of Questionnaire 1, the respondents' familiarity with each pattern is divided into three categories: very familiar, generally familiar, and unfamiliar. From the bar chart of the familiarity of decorative patterns, it can be concluded that the degree of familiarity of animal patterns is the highest, reaching 65%, while the proportion of unfamiliarity is the lowest, only 10%. Floral patterns are second, with a familiarity ratio of 57% and an unfamiliarity ratio of 13%. The degree of familiarity of character story patterns is the lowest, only 25%, and the proportion of unfamiliarity is the highest, accounting for 34%.

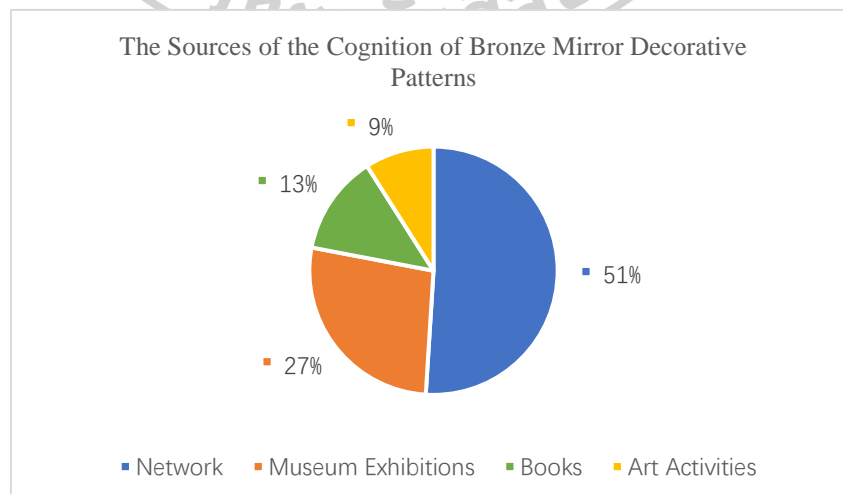


Figure 62 *The Sources of the Cognition of Bronze Mirror Decorative Patterns*  
 Note. Draw by the author,2024

Figure 67 is a data analysis pie chart of the sources of public cognition of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties in the questionnaire. The chart shows the sources of public cognition of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties. The questionnaire was used to count the channels through which respondents learned about these patterns. Among them, the Internet is the main source of public cognition, accounting for 51%. Museum exhibitions are second, accounting for 27%. Books and art activities contribute less, at 13% and 9% respectively. The researchers suggest that in order to spread the art and culture of bronze mirrors during the Song, Liao and Jin dynasties, cultural and museum exhibitions can be increased to improve the quality of the content and artistic aesthetics of the dissemination.

## 2) Analysis of public demand for innovative designs of bronze mirror decorative patterns

The analysis of the survey results on the needs of the public and tourists in Datong City, Shanxi Province for innovative designs of bronze mirror decorative patterns mainly comes from Questionnaire 2: Questionnaire on satisfaction with existing artworks of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties. The visualization analysis chart of the survey results is as follows:

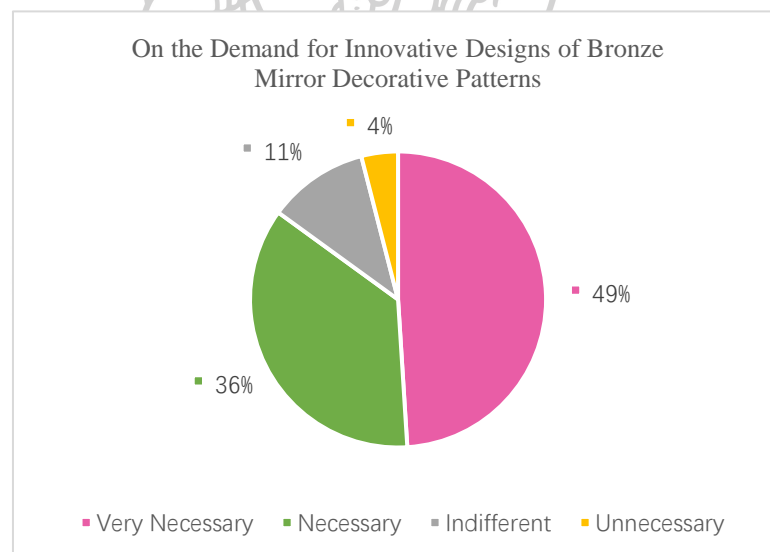


Figure 63 *On the Demand for Innovative Designs of Bronze Mirror Decorative Patterns*

Note. Draw by the author, 2024

The pie chart of the demand analysis for innovative designs of bronze mirror decorative patterns shows the percentage of the surveyed population's demand for innovative designs of bronze mirror decorative patterns during the Song, Liao and Jin dynasties. Among them, 49% thought that innovation was very necessary, 36% thought that innovation was necessary, 11% held an indifferent view, and 4% thought that innovation was not necessary. According to the statistics of the valid questionnaire data

collected, the demand for innovative designs of bronze mirror decorative patterns during the Song, Liao and Jin dynasties was generally high, showing that the market and the general public paid great attention to the inheritance and development of bronze mirror culture and art. The results reflect the importance that modern consumers attach to traditional cultural innovation. They hope to make traditional bronze mirror elements closer to contemporary life or aesthetic needs through innovative design.

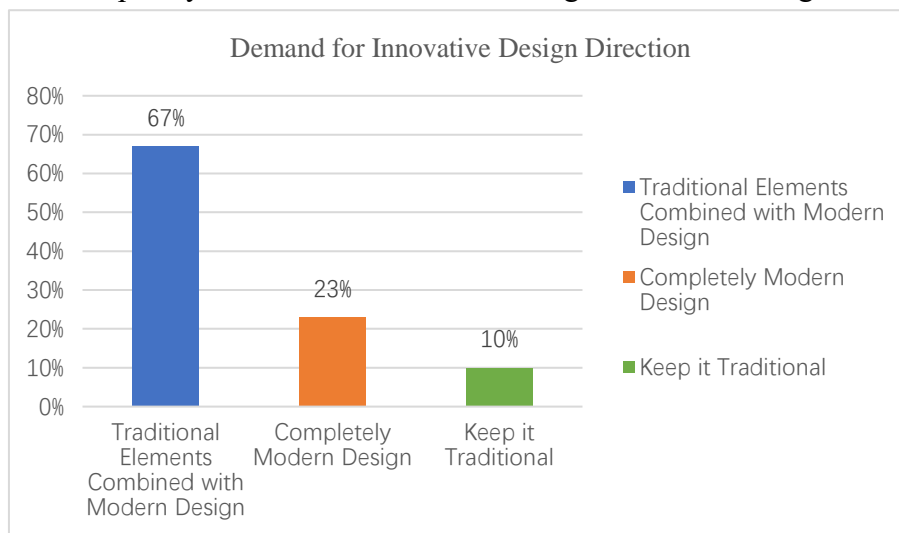


Figure 64 Demand analysis diagram for innovative design directions of bronze mirror decorative patterns

Note. Draw by the author, 2024

The innovative design direction bar chart shows the preference for innovative design direction of bronze mirror decorative patterns. According to this bar chart, the most popular direction is the integration of traditional elements and modern design, and 67% of the respondents prefer the integration of traditional elements and modern design. This shows that most people hope to retain the essence of traditional culture and reinterpret it through modern techniques to enhance the appeal of bronze mirror artworks. Completely modern design is second, with 23% of the respondents preferring completely modern design, which reflects the need of some respondents to completely break through the traditional framework and realize contemporary artistic expression. The demand for maintaining the traditional style is the lowest, with only 10% of the respondents hoping that the bronze mirror design will maintain the traditional style. This shows that although traditional design has its unique value, it lacks matching with modern needs and has weak appeal.

This questionnaire survey focuses on the recognition, preference, satisfaction and demand for innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties. Two questionnaires were designed and collected for the general public and tourists. The results show that the respondents have significant interest and expectations in the recognition of bronze mirror culture and art and the innovative design of decorative patterns.

First, from the perspective of the preference and recognition of bronze mirrors in the three different historical periods of the Song, Liao and Jin dynasties, the Song Dynasty bronze mirrors have the highest preference (60%) and recognition (55%) due to the artistic and cultural value of their decorative patterns, which is significantly higher than that of the Liao and Jin dynasties. This shows that the Song Dynasty bronze mirrors have stronger aesthetic appeal and cultural and artistic communication in the minds of the respondents. However, the recognition and preference of Liao and Jin Dynasty bronze mirrors are relatively low, at 20%-25% and 10%-15% respectively, indicating that their dissemination and promotion are weak, and researchers, governments and designers can increase their dissemination and promotion efforts.

Second, in terms of the recognition and preference of decorative patterns, there are obvious differences in the recognition and familiarity of animal patterns, floral patterns and character story patterns. Among them, animal patterns are most familiar with 65%, followed by floral patterns at 57%, while character story patterns are less familiar at 25%. This result shows that decorative themes of animals, plants, and nature are easier for the audience to accept and remember. At the same time, the Internet and museum exhibitions are the main sources of cognition, reflecting the synergy of contemporary digital communication and physical cultural and artistic displays.

Finally, in terms of innovative design needs, 85% of the respondents said that they need or need innovative designs for bronze mirror decorative patterns very much, among which "Traditional Elements Combined with Modern Design" became the most popular design direction with a support rate of 67%. This shows that modern consumers are more inclined to combine traditional cultural elements with contemporary art language, while the demand for completely modern design (23%) and maintaining traditional style (10%) is second.

In summary, this survey reflects the public's current cultural cognition of bronze mirror decorative patterns in the Song, Liao and Jin dynasties and their urgent need for innovative designs of modern bronze mirror decorative patterns. Future research and design practice should focus on the selection of representative patterns of bronze mirrors from the Song, Liao and Jin dynasties, while exploring design models and methods centered on "Traditional Elements Combined with Modern Design" to promote the regeneration and inheritance of China's bronze mirror cultural and artistic heritage in modern society.

#### 4.1.2 ANALYSIS OF FIELD SURVEY RESULTS

The Song, Liao and Jin dynasties were an important stage of cultural exchange and national integration in ancient China. The decorative patterns on bronze mirrors during this period showed unique characteristics of the times and the integration of regional culture. In order to gain a deeper understanding of the bronze mirrors and decorative patterns unearthed and collected in Datong City, Shanxi Province,

researchers conducted field research several times in 2023 and 2024. This section will elaborate on the process and results of the field research.

#### *4.1.2.1 FIELD RESEARCH PROCESS*

The researchers and team members conducted field research on the bronze mirrors in the Datong Liao, Jin and Yuan National Integration Museum and the Datong Museum, focusing on analyzing the characteristics of the decorative patterns on bronze mirrors during this period, representative patterns, and the artistic value of bronze mirrors. The following is the overall process of the time period, location, and research methods of the field research.

Field Research Time:

2023 and 2024, divided into three-time stages

Phase I (February-May 2023): Preliminary literature sorting and research planning.

Phase II (October-December 2023): Field research and data collection.

Phase III (March-June 2024): Analysis, summary and compilation.

Field Research Location:

1) Datong Liao, Jin and Yuan National Integration Museum: Researchers focus on bronze mirrors related to ethnic cultural integration during the Liao and Jin periods.

2) Datong Museum: Researchers focus on the decorative patterns of representative bronze mirrors from the Song, Liao and Jin periods in the museum, and analyze the artistic styles and traditional craftsmanship of different decorative patterns.

Field Research Methods and Process:

1) On-site observation: Researchers observe the bronze mirrors in the museum, and record the patterns, materials, sizes, ages and other information of the bronze mirrors.

2) Image recording: Use photographic equipment to record the details of the bronze mirror patterns for later analysis.

3) Museum interview: communicate with museum experts and staff to understand the historical background and discovery process of the bronze mirrors from the Song, Liao and Jin dynasties unearthed in Datong City.

4) Information sorting: The researcher uses the research tool of field observation cards to analyze and summarize the field research data and information with academic papers, books and other documents.



Figure 65 Field observation photos  
Note. Photographed by the author,2024

#### 实地观察卡片 (Field observation card)

标题: 大同市辽金元民族融合博物馆中铜镜展区装饰纹样的关注度

Title: The attention paid to the decorative patterns of bronze mirrors in the Liao, Jin and Yuan National Integration Museum in Datong City

观察时间(Observation time):

日期(Date):

时间段(Time period):

观察地点(Observation location):

大同市辽金元民族融合博物馆 铜镜展区

Datong City Liao, Jin and Yuan National Integration Museum Bronze mirror exhibition area

观察目的(Observation purpose):

分析观众对展区内宋辽金时期铜镜装饰纹样的关注度, 了解不同纹样在观众中的吸引力及其文化解读。

Analyze the audience's attention to the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in the exhibition area, and understand the appeal of different patterns among the audience and their cultural interpretation.

观察内容(Observation content):

1. 展区布局(Exhibition layout):

- 展品数量(Number of exhibits):
- 展品种类(Types of exhibits):

2. 观众关注行为(Visitor attention behavior):

- 平均停留时间 (记录观众在每个展品前的停留时长):  
Average stay time (record the length of time visitors stay in front of each exhibit)
- 观众的视觉焦点 (观众目光集中在哪些纹样或特定部分):  
Visitor visual focus (which patterns or specific parts the visitors focus on)
- 互动行为 (拍照、记录、与他人讨论等):  
Interactive behavior (taking photos, recording, discussing with others, etc.)

3. 观众特征(Visitor characteristics):

- 人数(Number of people):
- 年龄段(Age group):
- 性别分布(Gender distribution):
- 专业背景 (如是否有艺术设计或文化历史背景的观众, 若可观察到):  
Professional background (such as whether there are visitors with art design or cultural history background, if observable)

4. 纹样关注度分析(Pattern attention analysis):

- 哪些铜镜纹样最吸引观众?  
Which bronze mirror patterns attract the most visitors?
- 观众对不同的纹样反应差异:  
Differences in audience reactions to different patterns:
- 有无特别感兴趣的观众表现?  
Are there any visitors who are particularly interested?

5. 观众反馈(Visitor feedback):

- 现场讨论的热点话题 (观众是否对纹样的寓意、文化背景等展开讨论):  
Hot topics discussed on site (whether the audience discussed the meaning and cultural background of the patterns)
- 现场收集的简短访谈记录:  
Short interview records collected on site

记录人(Recorder):

姓名(Name):

联系方式(Contact information):

Figure 66 Field Observation Card  
Note. Draw by the author,2024

#### 4.1.2.2 RESULTS OF FIELD RESEARCH

The researchers used the field observation method to analyze and summarize the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties unearthed and collected in Datong City. At the same time, based on the content and classification of the decorative patterns of bronze mirrors unearthed in Datong City during the Song, Liao and Jin dynasties, the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties were systematically sorted out.

The researchers conducted a preliminary screening of bronze mirrors from the Song, Liao and Jin dynasties unearthed in Datong City through field observation combined with literature research. The main basis for screening includes the integrity of the bronze mirrors, the clarity and recognizability of the patterns, the symbolic meaning of the cultural connotation, the type and age, and other dimensions. On this basis, four main pattern types were summarized, and representative bronze mirror patterns that were well preserved and had design value were selected as the focus of further research. The following table shows the four types of bronze mirror patterns preliminarily selected by the researchers.

Table 20 *Types of Representative Bronze Mirror Patterns*

Pattern Type	Representative Bronze Mirror
Animal	Diamond-shaped Dragon Mirror; Single Dragon Mirror; Double Phoenix Mirror; Double Dragon Mirror; Cloud Dragon Pattern Mirror; Dragon and Tiger Mirror; Eight-curved Cloud and Dragon Pattern Mirror; Four Round and Four Chi Mirror; Double Fish Pattern Mirror, A total of 9 bronze mirrors.
Flowers and Birds	Mirror with auspicious beast and grape pattern; Diamond-shaped mirror with flower and bird pattern; Flower pattern mirror; Lotus pattern mirror; The Wild Goose Passing Through the Flower Mirror; Winding branches and flowers pattern, A total of 6 bronze mirrors.
Character Story	Figures viewing waterfalls; Immortal, Turtle and Crane Mirror; Mirror with boy and flower branches pattern; Character Story Mirror; Mirror with Double Fish and Mermaid Pattern; Character Story Handle Mirror; The Story of Xu You and Chao Fu; The Story of Wu Niu Panting Under the Moon; Immortal and Crane Longevity Mirror, A total of 9 bronze mirrors.
Inscription	Mirror with“卍”pattern; Homely Wealth Mirror; Sunlight bronze mirror; Poetry Mirror; Turtle and Crane Longevity Mirror; Mirror with continuous arc pattern and inscription, A total of 6 bronze mirrors.

*Note.* Author, 2024

Among them, animal patterns are mainly dragons, phoenixes, tigers, fish and other auspicious patterns, which show the pursuit of auspicious meanings during the Song, Liao and Jin dynasties. Flower and bird patterns are mainly lotus patterns, chrysanthemum patterns, twined flower patterns and other floral patterns, reflecting the aesthetic tendency of Central Plains culture. There are more grape patterns and twined flower patterns in Jin Dynasty bronze mirrors, which may be influenced by the cultural exchanges of the Silk Road. Character story patterns reflect people's social life scenes, folk culture and historical stories, and are of high value. Inscription patterns express the beautiful yearning of the people for family happiness and wealth during the Song, Liao and Jin dynasties, and auspicious inscriptions are common, such as "homely wealth".

In the field research of the Liao, Jin and Yuan National Integration Museum and Datong Museum in Datong City, the researchers conducted a detailed analysis and comparison of the decorative patterns of bronze mirrors in the Liao, Jin and Song dynasties. The researchers found that the decorative patterns of these bronze mirrors reflected a distinct northern ethnic style in pattern design, with rough and majestic artistic characteristics. The composition of these decorative patterns emphasizes rhythm and vitality, showing the nomadic culture's admiration for freedom and nature. At the Datong Museum, researchers focused on the decorative patterns of bronze mirrors from the Song, Liao, and Jin dynasties in the museum's collection. Through physical observation and image recording, researchers found that the artistic style and traditional craftsmanship of these bronze mirrors are unique. In addition, through interviews with museum experts and staff, researchers have a deep understanding of the historical background and discovery process of the bronze mirrors unearthed in Datong City, and further deepened their understanding of the artistic style and pattern meaning of bronze mirrors.

Based on the field research information, the researchers confirmed the decorative patterns of 30 representative bronze mirrors unearthed in Datong and well preserved through on-site observation, image recording, interviews, and information sorting. These bronze mirrors are not only works of art with unique artistic charm, but also important material evidence for studying the culture and art of the Song, Liao, and Jin dynasties.

#### 4.1.3 ANALYSIS OF EXPERT INTERVIEW RESULTS

As an important part of the research, expert interviews not only provide high-quality first-hand information for the research, but also provide a professional perspective for this research through theoretical deepening, case inspiration and methodological suggestions, ensuring the depth and accuracy of the research and enriching the research content. , broaden the analysis dimension, clarify the direction and methods of innovative design, guide the future focus and direction of research, and significantly enhance the academic value of this study. This section will elaborate

on the key issues discussed by experts, suggestions from expert feedback, and expert scoring results.

#### 4.1.3.1 DISCUSSION AND SUGGESTIONS ON KEY ISSUES

In order to explore the innovative design methods and inheritance significance of bronze mirror decorative patterns in the Song, Liao and Jin dynasties, the researchers interviewed a number of experts, professors and experts in the field of bronze mirror carving in China. The researchers also combined the expert questionnaire research method in the expert interview process. The key issues of the expert interview discussion are summarized in the following table:

Table 21 *Expert Interview Results*

Number	Content	Expert Recommendations and Feedback
Feedback 1	Cultural and artistic value	Experts generally believe that the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties carry profound historical and cultural connotations and have strong cultural and artistic research value.
Feedback 2	Design representativeness	Experts pointed out that the innovative design of decorative patterns on Song, Liao and Jin bronze mirrors requires attention to the structural layout of the patterns, the diversity of selection, clarity and representativeness.
Feedback 3	Innovation in production process	During the interview, several local experts in bronze mirror intangible cultural heritage carving emphasized that the breakthrough in bronze mirror casting technology is the basis for pattern innovation. The combination of modern technology can make the pattern more three-dimensional and exquisite.
Feedback 4	Design strategies incorporating shape grammar	1) Pattern extraction: extract the core graphic rules in the bronze mirror patterns through parametric modeling. 2) Modular reorganization: use shape grammar to recombine pattern elements and create a new formal language.
Feedback 5	The principle of balancing inheritance and innovation	1) Respect for history: Avoid excessive commercialization that weakens the cultural connotation of the original pattern. 2) Sustainable development: Emphasize the timeliness of the pattern in the design. Combined with modern design language, by simplifying lines, recombining pattern elements and combining

		modern materials, give traditional patterns new vitality.
		3) Multidisciplinary integration: Combine traditional intangible cultural heritage techniques and culture while thinking about modern technology and exploring the innovative possibilities of patterns.
Feedback 6	Application areas in modern design	Experts unanimously believe that these historical patterns have already appeared in the fields of cultural creation and home design. We should avoid worthless reproduction, respect the patterns of the bronze mirror as a work of art, and do a good job in pattern design.
Feedback 7	Future research directions and suggestions	<ol style="list-style-type: none"> <li>1) When designing, enhance the simplicity of the pattern and remove overly complex details to cater to the contemporary minimalist aesthetic trend.</li> <li>2) Redefine the pattern proportions with the help of parametric design methods to make it more modern.</li> <li>3) Classify and save the data of Song, Liao, Jin and bronze mirror patterns.</li> <li>4) Study how to promote Chinese traditional culture to the international market through pattern design.</li> </ol>

*Note.* Author, 2024

#### 4.1.3.2 ANALYSIS OF EXPERT SCORING RESULTS

After completing the preliminary screening and summary of the categories in the results of the field investigation, the researchers conducted discussions and research with experts in related fields and jointly scored the 30 representative bronze mirrors selected. To ensure the scientific nature of the scoring, the researchers designed an expert scoring table. The scoring dimensions include: clarity and completeness of preservation, pattern value, artistic composition, cultural implication and craftsmanship level, and the scoring range for each dimension is 1 to 10 points. Based on the total average score of the expert scoring table, the researchers conducted a comprehensive analysis and finally selected 6 bronze mirror decorative patterns with the most representative and research value.








Figure 67 Expert Rating Results


Note. Draw by the author, 2024

The above picture is a visualization of the total average score of the expert scoring table. The horizontal axis is the number of the bronze mirror, which corresponds to the expert scoring table one by one, and the vertical axis is the score (1-10 points). The yellow columns are the six bronze mirrors with the highest scores.

The researchers summarized the above information and the data from the field observation record into the following table:

Table 22 Comprehensive Table of Representative Bronze Mirror Data

No.	Name	Era	Size	Pattern Type	Conservation Status	Picture	Score
3	Double Phoenix Mirror	Song	17.5cm	Animal	Excellent		8.8
9	Double Fish Pattern Mirror	Jin	15.5cm	Animal	Excellent		9.2
11	Diamond-shaped mirror with flower and bird pattern	Song	9.5cm	Flowers and Birds	Fine		8.7
12	Flower pattern mirror	Liao	13cm	Flowers and Birds	Fine		8.4
18	Mirror with boy and flower branches pattern	Song	12cm	Character Story	Fine		8.3

23	The Story of Wu Niu Panting Under the Moon	Jin	13.7c m	Characte r Story	Fine		8.7
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*Note.* Author, 2024

The researchers selected the six most representative bronze mirrors based on expert advice and information and data recorded on field observations. Among them, there are 2 animals, 2 flowers and birds, and 2 stories. Because the decorative patterns of inscription-type bronze mirrors reflect documentary texts and blessing languages, which are adapted to the ancient history, culture and life at that time, they are slightly insufficient for the modern innovative design of decorative patterns. Therefore, after experts and researchers It was unanimously agreed that two of the most representative animals, flowers and birds, and stories of the era were selected for innovative design, including three from the Song Dynasty, one from the Liao Dynasty, and two from the Jin Dynasty.

In interviews with experts, research experts generally believe that the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties carry rich historical and cultural connotations and have significant cultural value and artistic research value. Experts emphasized that in the innovative design of bronze mirror patterns, special attention should be paid to the rationality of the structural layout, the diversity of pattern types, the guarantee of clarity, and the representativeness of the patterns. In addition, experts also mentioned that breakthroughs in bronze mirror casting technology are the basis for promoting pattern innovation. The combination of modern technology can not only improve the precision of patterns, but also make them more three-dimensional and exquisite.

#### 4.1.4 RESEARCH RESULTS OF ART DESIGN WORKSHOP

After completing the first part of the qualitative research of questionnaire survey analysis and literature analysis, the researcher conducted the second part of expert interviews and field research. The third part is the research results of the art design workshop. This section will elaborate on the workshop activity process and the results of the art design workshop.

##### 4.1.4.1 WORKSHOP PROCESS

The purpose of the art design workshop is to stimulate creativity and conduct modern aesthetic design innovation practices by exploring representative bronze mirror decorative patterns unearthed in Datong City during the Song, Liao and Jin Dynasties. The activity process requires communication and collaboration between group members, encourages participants to share ideas, and conduct design discussions and collaborations in professional fields. Workshop group members cultivate teamwork spirit and critical thinking through collective creative activities. Workshop participants include professors, doctors, designers and students aged 20-45.

Activity form: Organize seminars and invite relevant experts, scholars, and industry professionals to participate in discussions on the design elements, representativeness, innovation, and design strategies of bronze mirror decorative patterns during the Song, Liao and Jin Dynasties. Design practice exercises will be carried out through group cooperation. Under the guidance and feedback of experts, a complete set of design plans will eventually be formed, and the research results will be provided for the next step of design practice and exhibition by researchers.

Activity time: May 13, 2024-May 24, 2024

Table 23 Group Member List

Number	Name	Age	Affiliated Unit	Event Information
First group	Gao Yuhong	45	Communication University of Shanxi	Location: Taiyuan City, Shanxi Province Major: Art Design
	Li Jiongyi	32		
	Tian Yuan	33		
	Han Zhoumin	20		
	Tian Haoyuan	22		
Second group	Cao Yu	44		
	Zhang Xiyu	35		
	Jiao Xingjuan	36		
	Zhou Huan	35		
	Xue Junying	24		
Third group	Gao Peng	45		
	Liu Mengjie	32		
	Wu Yanan	34		
	Gu Chengzhuo	21		
	Song Peixue	23		

Note. Author, 2024

Workshop activity steps:

Step 1: Workshop planning and student recruitment

The workshop is divided into three main parts: seminar, field investigation and design practice, and plans to recruit 15 students to participate. The researcher introduced the overall design ideas of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in the form of a seminar, guided the members to analyze and summarize the most innovative design ideas, and the researchers formulated their own design plans based on the above information.

Step 2: Cultural connotation and design background explanation

The workshop lasted for two weeks. Five professional designers and professors were specially invited to explain the history, cultural connotation, cultural heritage and design methods of the decorative patterns of bronze mirrors in the Song, Liao and Jin

dynasties to the workshop members, helping members understand their cultural value and design characteristics, and laying a theoretical foundation for subsequent design practice.

#### Step 3: Design practice and review

Organize team members to participate in design practice. The first week arranges field research and analysis to obtain design inspiration and complete the design hand-drawn draft. The design requires members to extract elements from representative bronze mirrors, integrate innovative designs with regional cultural characteristics, and at the same time conform to the positioning of modern design aesthetics. The completed draft design will be reviewed by experts and designers to provide improvement suggestions.

#### Step 4: Design scheme display and optimization

Members will present preliminary design schemes, and experts and designers will give feedback and suggestions on site, and guide trainees to implement improvements. To ensure the quality of design, the workshop specially arranges one day for members to improve the design scheme. Together, they will lay a good design foundation for the decorative pattern design of bronze mirrors in the Song, Liao and Jin dynasties.

#### Step 5: Summary, discussion and experience sharing

At the end of the workshop, a seminar will be arranged to invite all participants to share their experience in design practice. Many trainees said that this design practice has improved their understanding and appreciation of decorative art, cultivated the creative thinking and practical ability of designers, and proposed to popularize relevant knowledge to more people through the promotion of workshops. The exchange of these design achievements and experiences has further promoted the practical exploration of innovative design of decorative patterns of bronze mirrors.



Figure 68 *Workshop Seminar*

*Note.* The privacy of participants is strictly protected during the research process of the art and design workshop, and the data and images are only used for the author's academic research. Photographed by the author, 2024

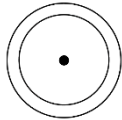
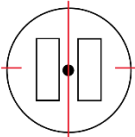


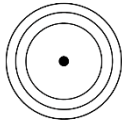
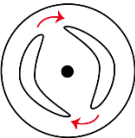
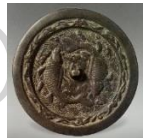





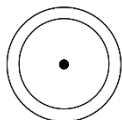



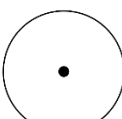
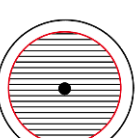
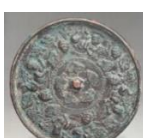

#### 4.1.4.2 ANALYSIS OF WORKSHOP RESULTS

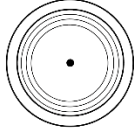
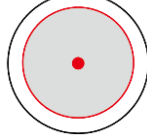


The workshop on innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties aims to explore and evaluate the process of design

projects and provide suggestions and feedback from students, teachers and industry experts. Through the design seminars of the workshop, researchers can timely adjust, modify and further improve the innovative design scheme based on the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties.

The following table is an analysis and summary of the results of the art design workshop. The researchers used shorthand to record key information and used the key problem analysis method to extract the consensus and suggestions of the participants and integrate them as follows. Special attention was paid to their discussion on the content of bronze mirror patterns, suggestions on the selection of pattern elements, the shape structure of bronze mirror decorative patterns, composition forms and practice and discussion of hand-drawn sketches of the design subject.

Table 24 Workshop Results Analysis Table

No.	Type	Shape	Pattern Elements	Composition	Picture	Hand drawing
1	Animal		Double phoenixes, Auspicious clouds, Curling grass			
2	Animal		Double fish, Water Ripples Pattern			
3	Flowers and birds		Birds, Flowers and plants, Cirrus clouds			
4	Flowers and birds		Lotus, Grass, Beads			
5	Story		Children, Lotus, Beads, Flowers and Leaves, Butterflies			

6	Story	Buffalo, Ruyi cloud pattern, Crescent moon, Water ripples, Plants				
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*Note.* Author, 2024

The workshop participants are all art design majors. They have a solid foundation in design theory and are familiar with the design process. As a young generation of designers, the members successfully combined the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties with modern art design methods and aesthetic needs, reflecting a distinct sense of innovation and diverse design expressions. These design suggestions not only meet contemporary aesthetic needs, but also demonstrate the vitality of traditional culture in the contemporary context, helping to popularize and enhance the cognition of traditional crafts.

Table 25 Expert Guidance Result Analysis Table

Design Proposal	The workshop members analyzed, sorted and extracted the basic patterns of representative bronze mirrors, drew sketches, and analyzed the structure and composition of the bronze mirrors, providing a solid foundation for the design of subsequent researchers.
Design Features	Based on the main body of 6 representative bronze mirror decorative patterns, combined with modern linear expression style, deformation, repetition and rotation design are carried out.
Advantage	<ol style="list-style-type: none"> <li>1. Accurate extraction of cultural elements;</li> <li>2. Accurate composition expression;</li> <li>3. Correct pattern selection method;</li> <li>4. Strong cultural implication and depth</li> </ol>
Importance	It emphasizes the modernity and representativeness of the decorative patterns, embodies the profound meaning of Chinese traditional culture, and is an important manifestation of cultural heritage.
Suggestion	<ol style="list-style-type: none"> <li>1. Refine the lines to enhance the sense of refinement</li> <li>2. Focus on the actual presentation of the pattern on the brass material</li> <li>3. Enrich the dynamics of the pattern to avoid monotony</li> <li>4. Combine modern typography and design tools to optimize the design effect</li> </ol>

*Note.* Author, 2024

The workshop combined the professional guidance of industry professors and demonstrated a design platform with the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties as the core. It is an innovative practice activity that combines the inheritance of Chinese artistic and cultural heritage with the design of modern decorative patterns. The participating members have a strong interest in the history, craftsmanship, and artistic characteristics of the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties, achieving the goal of spreading Chinese traditional culture and increasing public attention. The bronze mirror patterns, with their unique shapes and delicate craftsmanship, show the formal beauty of traditional Chinese decorative art and provide aesthetic inspiration for modern design.

#### 4.1.5 SUMMARY

Part 4.1 of this research aims to explore the innovative design process and results of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China through data and information summary of research methods. The researchers promoted the design feasibility and research strategy of bronze mirror decorative patterns in the Song, Liao and Jin dynasties through questionnaire surveys, field observations, expert interviews and art workshops, creating bronze mirror pattern artworks with more depth, connotation, cultural implications, artistic value and aesthetics, adding some new parts to traditional Chinese decorative pattern art and modern pattern art design. At the same time, this study will promote the dissemination and development of Shanxi's traditional cultural art in China and even in the international perspective.

The results of the questionnaire survey are summarized as follows: the demand for innovative design of bronze mirror decorative patterns is clear and strong, especially for the young consumer market, and innovative design has broad prospects. The integration of tradition and modernity is the core direction of design development, emphasizing the balance between cultural inheritance and innovation. Combined with the survey results, the researchers summarized and put forward five suggestions on the dissemination and protection of culture and art.

1) Designers and researchers should increase the design research and dissemination of bronze mirror patterns in the Liao and Jin dynasties.

2) Increase the fun of cultural communication for young groups, and make young groups the main communication group.

3.) Develop more interactive art activities or art design exhibitions with bronze mirrors as the theme.

4) Design innovation needs to be based on traditional culture, and adding modern elements is the general trend. This method can attract a wider market group.

5) Designers and art design researchers can focus on and launch bronze mirror artworks that meet contemporary aesthetic needs.

In the research of innovative design of decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, field research provides an important research basis for design work. Through field visits to the Liao, Jin and Yuan National Integration Museum and the Datong Museum in Datong City, the research team learned in detail about the typical patterns of bronze mirrors in the Song, Liao and Jin dynasties and the cultural connotations behind them. During the investigation, the researchers classified and sorted the exhibits, especially focusing on the analysis of representative bronze mirror patterns. The content, shape and structural characteristics of these patterns provide rich reference materials for subsequent design work, and also lay a solid foundation for extracting design elements. The field research also helped researchers to better understand the impact of the integration of different cultures during the Song, Liao and Jin dynasties on the innovation of bronze mirror decorative patterns, thereby broadening the cultural vision of design.

In the expert interview seminar, experts put forward specific suggestions on the application of shape grammar design methods: extract the core graphic rules in bronze mirror patterns through parametric methods, and use modular reorganization to recombine pattern elements to create a new formal language. Experts unanimously agreed that in the process of inheritance and innovation, design should follow the following principles: respect history and avoid excessive commercialization that weakens the cultural connotation of patterns; emphasize sustainable development, combine modern design language to simplify lines and recombine pattern elements to give traditional patterns new vitality; and integrate multiple disciplines, taking into account traditional intangible cultural heritage techniques and modern technology, and exploring more possibilities for pattern innovation.

Experts also emphasized that in the fields of cultural creation and home design, traditional patterns have been used, but to avoid meaningless replication, it is necessary to respect the original pattern nature of bronze mirror artworks and carefully design their details. At the end of the interview, the experts put forward some suggestions for future research, including: enhancing the simplicity of patterns to adapt to the trend of contemporary minimalist aesthetics; classifying and preserving the data of Song, Liao and Jin bronze mirror patterns; and exploring how to promote Chinese traditional culture to the international market through pattern design. These suggestions provide valuable guidance for future research and innovative design of bronze mirror decorative patterns.

The art design workshop transforms the results of field research, expert interviews and questionnaires into creative design plans and ideas through multi-dimensional design and analysis. In the workshop, the research team conducted an in-depth analysis of the content of representative bronze mirror patterns, including the preliminary selection and extraction of pattern elements, analysis of structure and composition, etc. At the same time, the designer transformed the analysis results into innovative design expressions through hand-drawn sketches. This process not only strengthened the researchers' understanding of the form and structure of the decorative

patterns of Song, Liao and Jin bronze mirrors, but also explored the translation and re-creation of traditional patterns in modern design. The practice of the workshop further promoted the integration of traditional Chinese decorative art and contemporary pattern design, and highlighted the artistic value of bronze mirror patterns in contemporary design.

## 4.2 DESIGN PROCESS AND RESULTS BASED ON RESEARCH DATA

### 4.2.1 CONSTRUCTION OF BASIC RULES OF SHAPE GRAMMAR

Shape Grammars (SG) is a design reasoning method that uses labeled shapes as basic elements and shape rules to generate new shapes. In 1980, George Stiny, a professor in the Department of Architecture at the Massachusetts Institute of Technology, and his team described in detail the definition of shape and shape grammar, and initially proposed the concept of parametric shape grammar, laying a theoretical foundation for the development of shape grammar.

Simply put, shape grammar is a research method based on shape operations, using symbolic shapes as basic elements and using grammatical structures to analyze and generate new shapes. Shape grammar can be used as a design language to create new graphic forms, and can also be used to analyze the forms of existing designs. It is both generative and analytical.

The shape elements contained in shape grammar are "vocabulary", and the reasoning rules are "logic". The shape elements generate shape processes according to the reasoning rules. Therefore, the advantage of shape grammar is that the program is clear and easy to understand, and even people without a design background can learn to use it. According to a series of shape rules, shapes that did not exist before can be generated from several known groups of shapes, and through the repeated application of finite rules and graphic elements, the graphics that can be obtained are innovative.

In essence, shape grammar is a design method based on "shape" operations. It refers to a design reasoning method that generates new shapes by placing one or more shape elements in a spatial relationship according to the set rules and order. According to George Stiny's definition of shape grammar, shape grammar can be expressed as a four-tuple:  $SG=(S,L,R,I)$ , where SG is a set of shapes derived from S through certain rules and orders such as rotation, mirroring, translation and other operation commands; S represents a finite set of shapes; L is a finite set of labels; R is a finite set with certain deduction rules; I is the initial shape. It was originally used in painting, sculpture and architectural design, and later widely used in the fields of graphic and industrial design. It mainly changes the shape elements so that the elements are deduced according to certain rules, and the generated new elements have certain inheritance of the properties of the original elements.

From the theoretical definition of shape grammar, we can know that the rule R in shape grammar represents the order relationship between shapes, that is, the evolution

process from one form to another, which has a certain computational nature and is also called an operation process from a mathematical perspective. The shape grammar rules in this study adopt generative rules. The graphics formed by using generative rules change the differences in position and proportion, thereby forming new graphic combinations. Commonly used shape grammar reasoning rules include copying, rotation, mirroring, translation, etc.

Shape grammar is widely used in design, covering industrial design, environmental design, and visual design. Generally speaking, the process of pattern design using shape grammar can be summarized as follows:

The first step is to determine the basic shape. By analyzing the elements of previous patterns, representative basic features are extracted and used as the basis for new pattern design.

The second step is to summarize the rules of shape change. The rules of shape change are greatly affected by external factors and there are many types. The corresponding rules should be obtained mainly by summarizing the transformation rules of previous patterns. In addition, designers also consider the innovative changes brought about by factors such as social trends and modern aesthetic psychology, and establish the connection between rules and perceptual images.

The third step is to establish the spatial constraint relationship. The appearance of the design is often restricted by conditions such as structure, processing technology, and materials, so the spatial constraint relationship should be determined based on these constraints.

The fourth step is to follow certain change rules based on the initial shape and specific design requirements to generate a new image.

The basic rules of shape grammar for decorative pattern design in this research are constructed as follows:

Table 26 *The basic rules of shape grammar in this research are constructed*

No.	Rule	No.	Rule
R1	Center rotation 90 degrees	R6	Horizontal mirror
R2	Center rotation 45 degrees	R7	Center rotation 180 degrees
R3	Center rotation 72 degrees	R8	Center rotation 36 degrees
R4	Mirror vertically	R9	Single pattern
R5	Horizontal movement	R10	Tiling inside a circle

*Note.* Author, 2025

#### 4.2.2 ELEMENT EXTRACTION PROCESS OF BRONZE MIRROR

##### DECORATIVE PATTERNS

Semiotics is a discipline that studies the mechanism of symbols and their meaning generation, covering all media that can convey meaning, such as language, images, behavior, and objects. As an interdisciplinary theoretical system, the theoretical basis of semiotics originates from the semiotic views of two scholars,

Saussure and Peirce: the former emphasizes that symbols are composed of the arbitrary combination of "signifier" and "signified", while the latter divides symbols into three types: image symbols, indicators, and symbols. Semiotics not only focuses on the structural characteristics of the symbol itself, but also emphasizes its role in the social and cultural system, becoming an important tool for understanding human cognition, communication, and social structure.

There are various methods for extracting symbols, aiming to reveal the cultural background and connotation hidden behind the symbol. Among them, the text analysis method explores the potential path of meaning generation through the structural interpretation of media elements such as images and texts; the hierarchical analysis method divides the meaning of symbols into literal layer, cultural layer, and myth layer based on Barthes' theory, and deeply reveals its ideological function. In addition, the contrastive analysis method reveals the ambiguity and dynamics of symbols through the differences between different cultures or media. These methods constitute an important analytical path in semiotic research and are widely used in many fields such as visual arts, advertising communication, and social research.

Based on the research data, the researchers combined semiotics theory and shape grammar design theory to extract 17 pattern elements from bronze mirrors unearthed and collected in Datong City, Shanxi Province during the Song, Liao and Jin Dynasties for innovative pattern design. The main extraction steps are divided into the following three steps:

Step 1: Pattern extraction and analysis: Based on the previous data collection, sorting and summary, the researchers combined the historical background, cultural implications and design value of the research, and obtained the results through comprehensive research methods and classified, analyzed and selected the traditional basic patterns.

Step 2: Drawing of design elements: After the pattern is selected, a sketch is drawn to extract the main decorative elements on the bronze mirror. Remove interference factors during the design process, such as: eliminate and modify pattern defects caused by rust and wear, ensure the extraction of complete patterns, and make design changes and fine-tuning while retaining the basic patterns and cultural background. At the same time, analyze the structure, line style, and symmetry of the pattern to extract the core design elements.

Step 3: Pattern deformation and innovation: Use vector drawing software Adobe Illustrator to convert the extracted patterns into editable vector patterns. Combining modern design techniques to innovate traditional patterns, it can be innovative while retaining the traditional cultural meaning and conform to modern aesthetic characteristics.

The researchers extracted the bronze mirror pattern elements and used shape grammar rules to analyze and reconstruct them to achieve innovative design of patterns. The specific process is shown in the figure below.

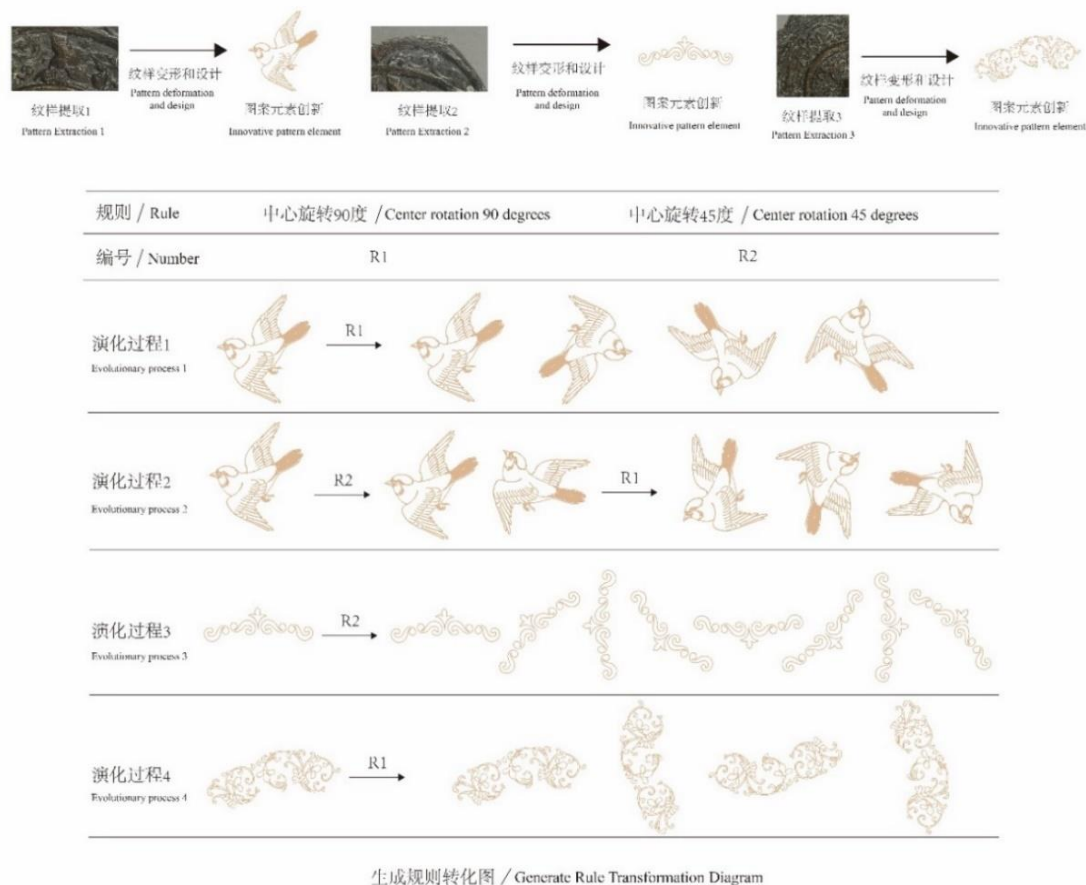


Figure 69 Illustration of the pattern extraction process and generation rule transformation of the diamond-shaped mirror with flower and bird patterns  
 Note. Draw by the author, 2025

The above picture shows the pattern extraction process and generation rule transformation diagram of the diamond-shaped mirror with flower and bird patterns. The decorative pattern of this bronze mirror mainly extracts three pattern elements: sparrow pattern, curling grass pattern and flower branch pattern. The researchers deformed and innovatively designed them; constructed two shape grammar rules, namely R1 and R2; and simultaneously carried out four groups of evolution process calculations.

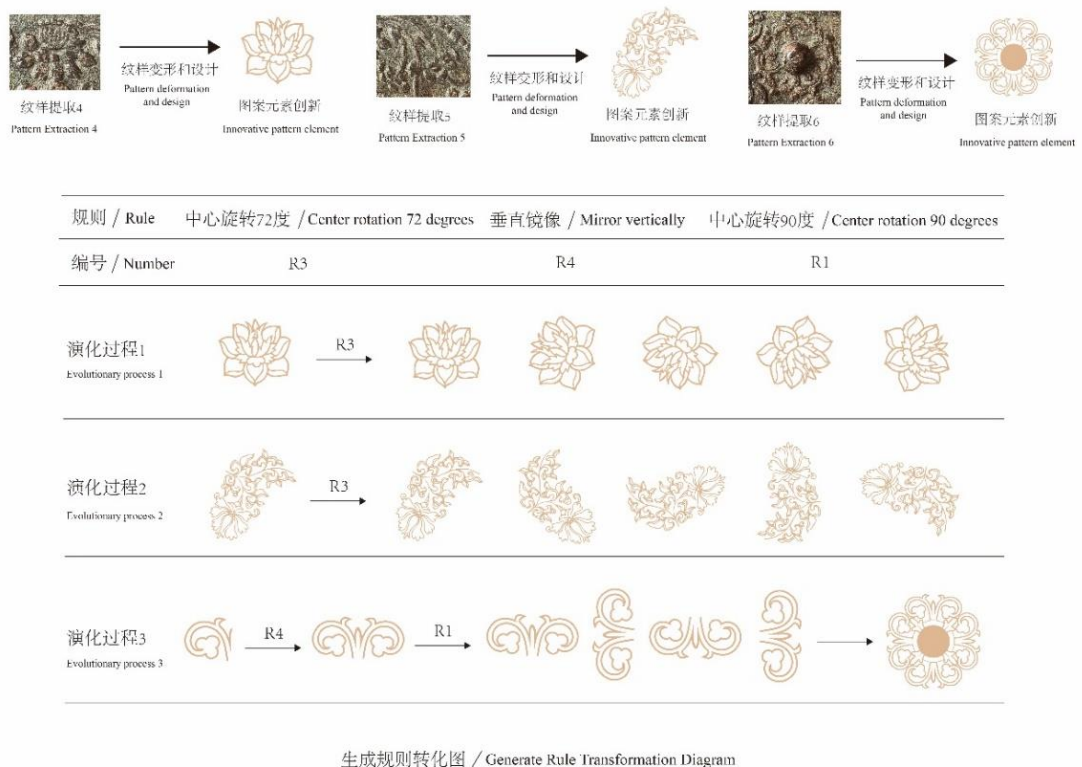


Figure 70 Pattern extraction process and generation rule transformation diagram of flower pattern bronze mirror  
 Note. Draw by the author,2025

The above picture shows the pattern extraction process and generation rule transformation diagram of the floral pattern bronze mirror. The decorative pattern of this bronze mirror mainly extracts three pattern elements: lotus pattern, flower and leaf pattern, and twined branch pattern. The researchers deformed and innovatively designed them; constructed three shape grammar rules, namely R1, R3 and R4; and at the same time, performed three sets of evolution process calculations.

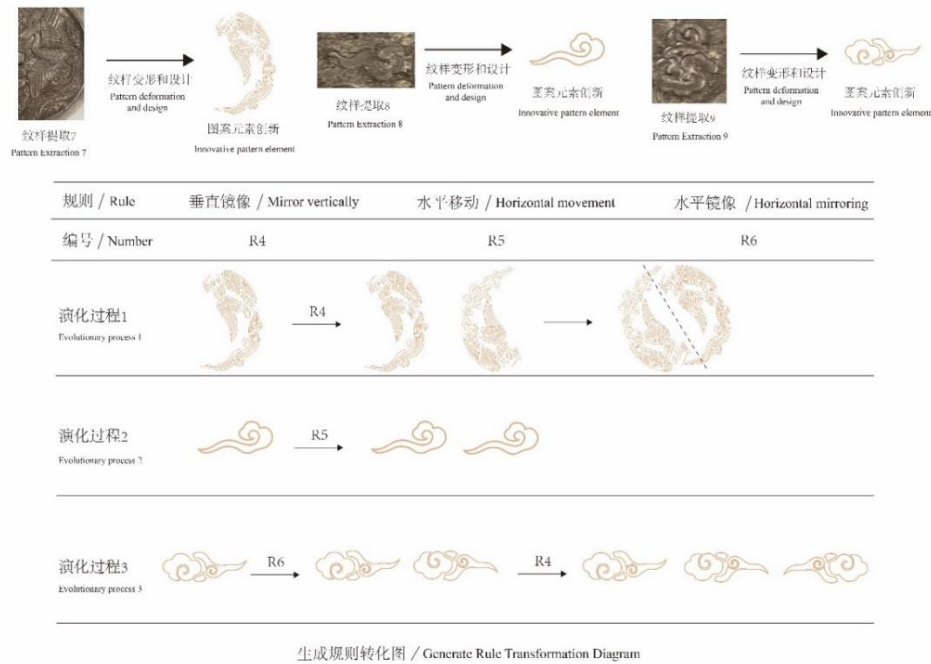


Figure 71 Pattern extraction process and generation rule transformation diagram of the double phoenix pattern bronze mirror  
Note. Draw by the author,2025

The above picture shows the pattern extraction process and generation rule transformation diagram of the double phoenix pattern bronze mirror. The decorative pattern of this bronze mirror mainly extracts three pattern elements: phoenix pattern, cirrus pattern and auspicious cloud pattern. The researchers deformed and innovatively designed them; constructed three shape grammar rules, namely R4, R5 and R6; and at the same time, carried out three groups of evolution process calculations.

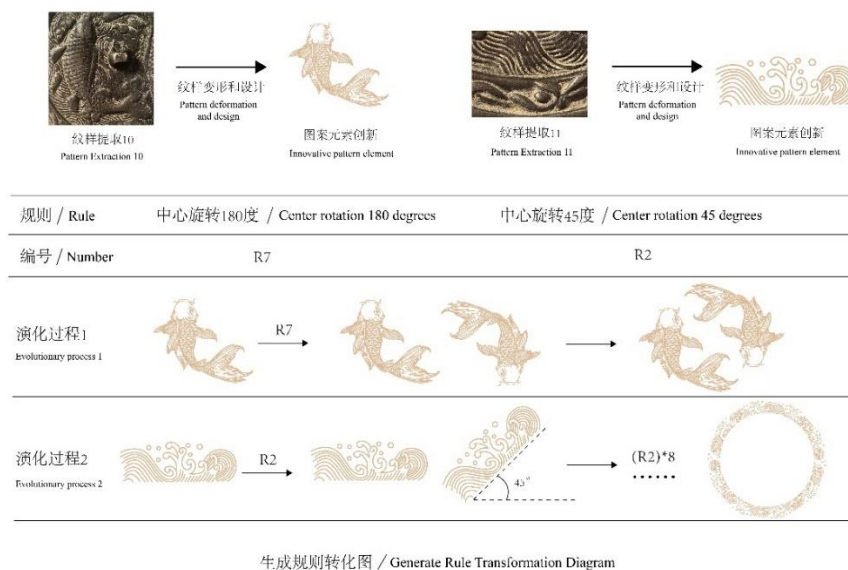


Figure 72 Pattern extraction process and generation rule transformation diagram of the bronze mirror with double fish pattern

Note. Draw by the author,2025

The above picture shows the pattern extraction process and generation rule transformation diagram of the double fish pattern bronze mirror. The decorative pattern of this bronze mirror mainly extracts two pattern elements, fish pattern and sea wave pattern. The researchers deformed and innovatively designed them; constructed two shape grammar rules, namely R2 and R7; and at the same time, carried out two groups of evolution process calculations.

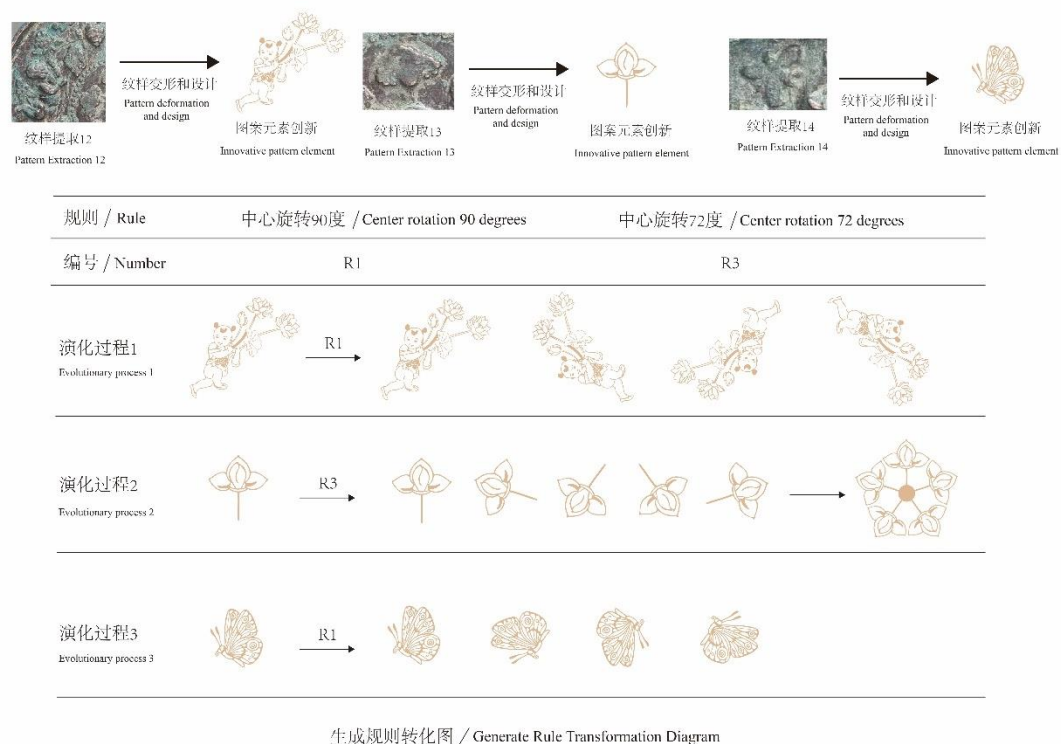


Figure 73 The pattern extraction process and generation rule transformation diagram of the boy wearing a flower mirror

Note. Draw by the author,2025

The above picture shows the pattern extraction process and generation rule transformation diagram of the boy wearing a flower mirror. The decorative pattern of this bronze mirror mainly extracts three pattern elements: the image of a boy, flower and leaf patterns, and butterfly patterns. The researchers deformed and innovatively designed them; constructed two shape grammar rules, namely R1 and R3; and simultaneously performed inferences on three groups of evolutionary processes.

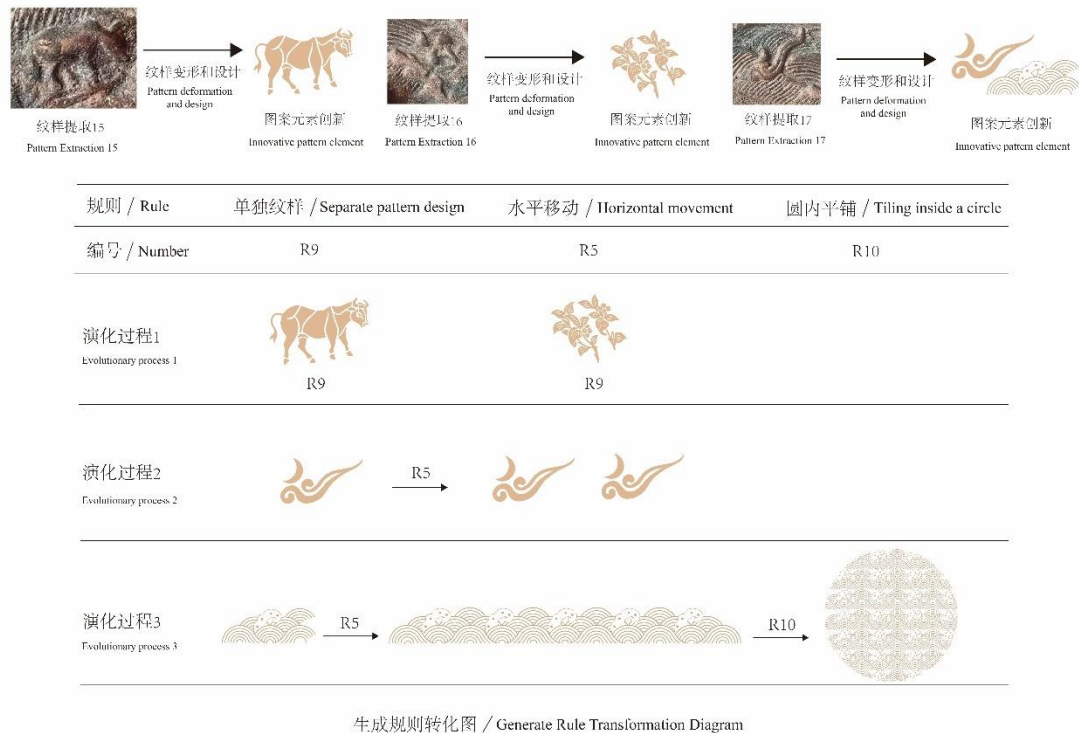
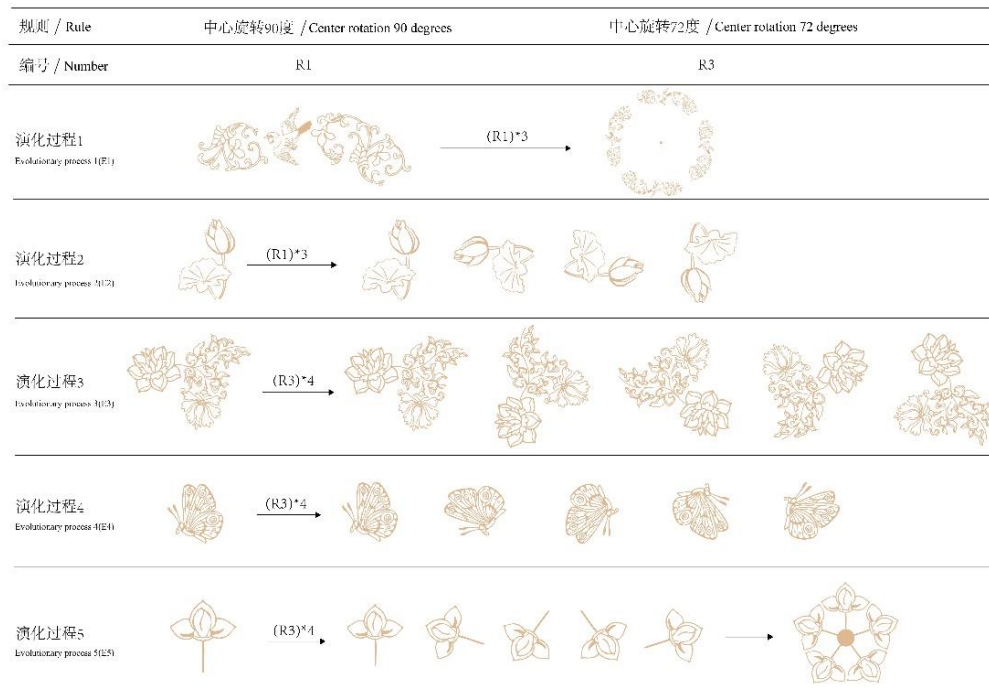


Figure 74 Pattern extraction process and generation rule transformation diagram of buffalo and moon mirror  
Note. Draw by the author, 2025

The above figure shows the pattern extraction process and generation rule transformation diagram of the buffalo and moon mirrors. The decorative pattern of this bronze mirror mainly extracts three pattern elements: buffalo pattern, auspicious cloud supporting moon pattern and water ripple pattern. The researchers deformed and innovatively designed them; constructed three shape grammar rules, namely R5, R9 and R10; and calculated three groups of evolution processes at the same time.

After extracting and redesigning the elements of the above six bronze mirrors, the researchers further conducted a second round of screening from 17 representative design elements, and finally selected 11 elements to create two new modern bronze mirror patterns. The specific evolution process and design rules are shown in the figure below.



生成规则转化图 / Generate Rule Transformation Diagram

Figure 75 The author's original pattern extraction process and generation rule transformation diagram of the flower and bird pattern mirror  
Note. Draw by the author, 2025

The bronze mirror pattern in the above picture is the seventh bronze mirror pattern designed by the researcher, and the researcher named it the bronze mirror with flower and bird patterns. This pattern design combines 2 shape grammar rules and performs 5 sets of evolutionary process calculations. The evolutionary process is named E by the researcher, and then the new design pattern is added, named SG1. That is:  $SG1=E1+E2+E3+E4+E5$ .

The bronze mirror pattern in the figure below is the eighth bronze mirror pattern designed by the researcher, and the researcher named it the bronze mirror with boy and auspicious beast patterns. This pattern design combines 4 shape grammar rules and performs 3 sets of evolutionary process calculations. The new design pattern is added, named SG2. That is:  $SG2=E1+E2+E3$ .

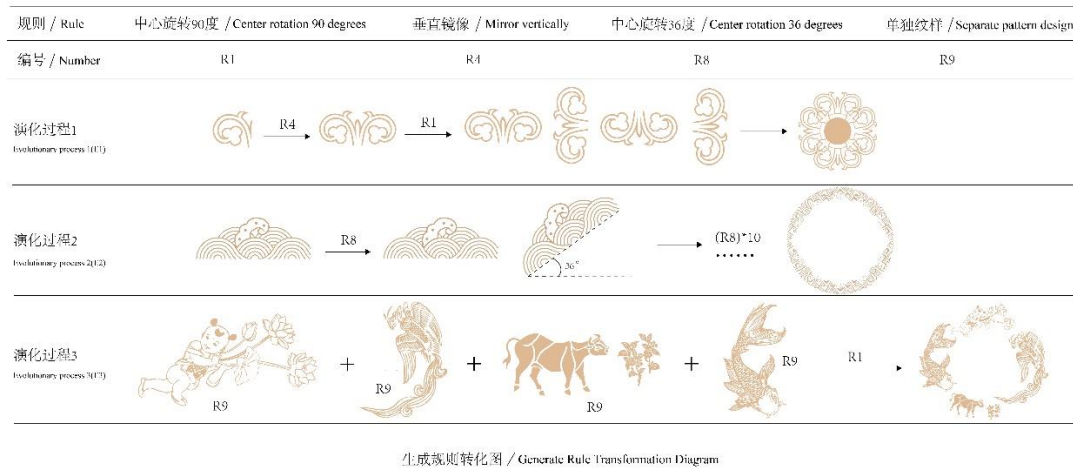


Figure 76 The pattern extraction process and generation rule transformation diagram of the bronze mirror with boy and auspicious beast pattern  
*Note.* Draw by the author,2025

This section constructs a systematic innovative design method by combining the analysis of the element extraction process of bronze mirror decorative patterns with the shape grammar rules. The researchers first classified, analyzed and extracted the typical patterns of bronze mirrors in ancient China during the Song, Liao and Jin dynasties, and identified representative modeling elements. On this basis, the rules of shape grammar were used to disassemble, reorganize and evolve the patterns to form new design combinations.

Through multiple rounds of screening and optimization, the researchers finally extracted key design elements and used them to construct innovative bronze mirror patterns that conform to modern aesthetics. This method not only retains the cultural connotations of traditional bronze mirror patterns, but also gives them a new formal language, expands the theoretical value of bronze mirror art in modern decorative pattern design, and provides a reference for the innovative transformation of traditional patterns.

#### 4.2.3 INNOVATIVE DESIGN AND CARVING STEPS OF BRONZE MIRROR PATTERNS

##### 4.2.3.1 INNOVATIVE DESIGNS OF BRONZE MIRROR DECORATION PATTERNS









Through the design and construction of shape grammar, the formulation of generation rules, and the multiple selection and extraction of historical pattern elements, the researchers repeatedly studied the composition rules and visual forms of the patterns. According to their cultural implications and connotations, they innovated







and improved on the basis of retaining the pattern characteristics of the Song, Liao and Jin dynasties in China, designed 6 bronze mirrors, and then innovated the patterns again on the basis of this design result, and designed 2 completely new bronze mirror decorative patterns, which are the synthesis and essence of the previous 6 bronze mirrors. The researchers innovated on the basis of tradition and inherited and developed on the premise of innovation.

The researchers' innovation is not only the innovation of patterns, but also the integration and innovation of design theory and method, combining bronze mirror decorative patterns with the theory of shape grammar design method, which is a gap in the history of relevant research. This study will promote China's excellent artistic and cultural heritage and develop and inherit it.

The following table shows the results of the researchers' innovative design of bronze mirror decorative patterns after discussions and interviews with experts, professors, team members, inheritors of intangible cultural heritage, and provincial arts and crafts masters.

Table 27 *The results of innovative design of bronze mirror decorative patterns*

No.	Name	Dynasty	Historical Images	Design	Meaning
1	Diamond-shaped bronze mirror with flower and bird patterns	Song			Vitality, Freedom, Wit
2	Double Fish bronze mirror	Jin			Prosperity, Happiness, Longevity
3	Flower mirror	Liao			Auspicious, Kind, Pure
4	Double Phoenix Mirror	Song			Beautiful, Peaceful times

5	Children and flower mirror	Song			Happiness, Purity, and a better life
6	Buffalo and Moon Mirror	Jin			Have the courage to face setbacks
7	Flower and Bird Pattern Mirror	Modern	Author's original		Freedom, Purity, and endless life
8	Children and Auspicious Animal Pattern Mirror	Modern	Author's original		Brave, Auspicious, Wealthy

Note. Author, 2025

#### 4.2.3.2 STEPS OF CARVING DECORATIVE PATTERNS ON BRONZE MIRRORS

The bronze carving craft is a representative characteristic skill of Datong City, Shanxi Province, China. It was listed in the fourth batch of national intangible cultural heritage representative projects in 2014. Due to its high technical difficulty, the craftsmen engaged in this craft must have a certain aesthetic sense, and at the same time have a basic understanding of painting, design and sculpture, and must master the basic skills of carving.

The researchers conducted a preliminary analysis and evaluation of the carving effect of the bronze mirror design drawing through field investigations, expert interviews and practical research methods, and after many discussions and consultations with intangible cultural heritage inheritors, experts and arts and crafts masters. The results are as follows:

Table 28 Table of subjective evaluation results of innovative design of bronze mirror decorative patterns

Evaluation indicators	Evaluation content	Evaluation score%
Overall	Unique design style, modern and artistic	94%

aesthetics		
Visual Effects	The patterns are rich in layers, the details are exquisite, the lines are smooth and clear, and the decorative elements are clearly layered	96%
Composition	Coordinated layout, balanced proportions, harmonious unity	91%
Shape	The appearance and decoration complement each other, but the appearance needs to be slightly adjusted according to production and market	84%
Size design	The size design is suitable, which meets the unity of functional and aesthetic needs	85%

*Note.* Researchers draw their own, 2025

The evaluation results show that the experts and carving masters are highly satisfied with the decorative patterns of the bronze mirrors designed by the researchers, and generally believe that they conform to the public aesthetics. Some suggestions were given for the appearance design and size. For example, the inheritors of intangible cultural heritage suggested that the size design should conform to the modern public aesthetics, and the size should not be too large. The recommended size diameters are: 20cm and 12cm. This size is not only practical, but also the bronze mirror carving results themselves are works of art with aesthetic and artistic value. This size is also suitable for collection and display. For the size production and sales of the convenient gift design part, experts recommend a diameter of 8cm, which is smaller. For example, the bronze mirror design of cultural and creative products is mainly for easy carrying. It is recommended that researchers distinguish the size design according to the purpose of the design results. At the same time, it is necessary to consider the visual effect of the pattern to determine the final size of each bronze mirror. The figure below is a diagram of the size of the bronze mirror designed by the researcher. Different colors represent different bronze mirror sizes. Red is 4 bronze mirrors with a diameter of 20cm, and yellow is 3 bronze mirrors with a diameter of 12cm. The green part is a small-sized bronze mirror designed as a cultural and creative product, with a diameter of 8 cm. Due to its size and purpose as well as its comprehensive practicality and aesthetics, experts and researchers unanimously decided to design the eight-petal diamond-shaped bronze mirror with flower and bird patterns as a cultural and creative product display model, using modern machine engraving methods, while the remaining 7 bronze mirrors will be manually carved by masters to give full play to their artistic value and collection value, demonstrating the inheritance of Datong City's intangible cultural heritage skills and the spirit of craftsmanship.

## 8 Bronze Mirrors Size Design Diagram

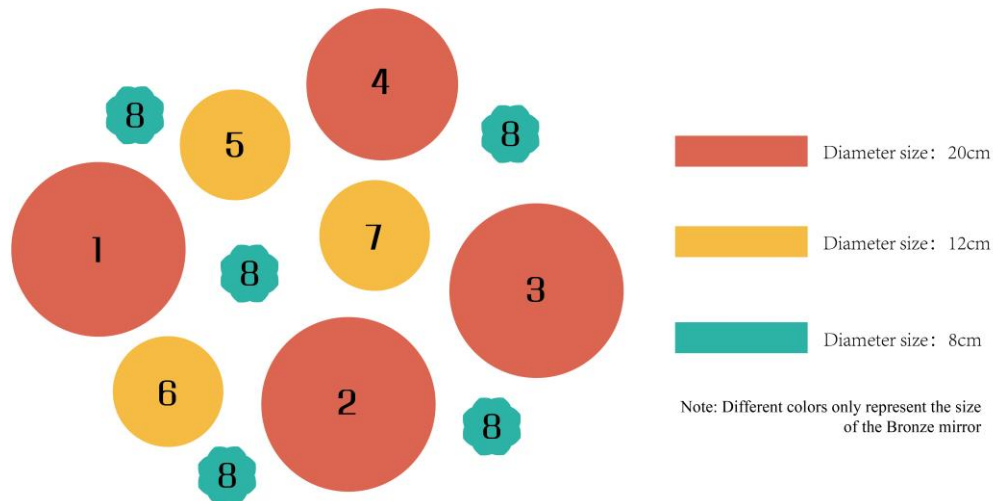


Figure 77 Schematic diagram of bronze mirror size design

Note. Draw by the author,2025

After the initial pattern design communication and scoring results, the researchers entered the engraving process. The main processes of bronze mirror engraving include: pattern design, printing and tracing, material selection, casting mirror blanks, glue making, gluing, engraving, beading, calendaring, flattening, film sealing, and finished products. The researchers summarized the key processes as follows:

1) Material selection and casting: First, high-quality brass is selected as the base material, and the mirror blank is cast by a professional brass factory. The mirror blank in this study is mainly round. During production, the mirror body is ensured to be uniform in thickness and flat on the surface, providing a good foundation for subsequent engraving.

2) Preliminary finishing: The factory will finish the cast mirror blank, including polishing the mirror surface, removing the casting burrs and oxide layer, so that the surface is smooth for the engraving process.

3) Design and description: According to the decorative style and artistic style of the bronze mirror, determine the final pattern and print it in proportion, draw it on the workpiece with carbon paper, and preliminarily outline the pattern on the back surface of the mirror to ensure the accuracy of the carving process.

4) Gluing: After the rosin, cement and engine oil are mixed according to the ratio, they are melted in an iron pot and poured on one side of the workpiece. They can be engraved after cooling. After engraving, they can be detached after heating with a blowtorch.

5) Engraving (positive text process): A carving knife is used to perform shallow relief processing on the back surface of the mirror. According to the discussion and analysis of the researchers and masters, the pattern of this study is more suitable for shallow relief. The carving process is fine and smooth, reflecting the three-dimensional sense and layering of the decoration.

6) Engraving (negative text process): Using chisels of different shapes, the pattern is detailed by knocking or pressing, which enhances the exquisiteness and decorative effect of the decoration. The engraving process includes line engraving (carving out the outline), dot engraving (enhancing the texture) and net engraving (forming a fine texture). These techniques are basically manual operations. The craftsmen hold the chisel in one hand and the hammer in the other hand, and make the surface of the workpiece appear concave and convex by knocking, making it concave and convex, staggered, clear light and dark, and strong contrast, making the bronze mirror pattern more vivid and becoming an exquisite work of art.

The picture below is a picture of the researcher practicing the bronze mirror engraving technique and discussing and studying with the craft master.



Figure 78 Researchers' practical learning pictures

Note. Photographed by the researcher, 2025

7) Polishing and modification: After the pattern is carved, the surface of the bronze mirror is further polished to make the ups and downs of the pattern transition naturally, and then sent to the factory for professional polishing technology to make it glossy and even, thus enhancing the decorative effect.

8) Surface treatment: After the bronze mirror is carved, in order to make the pattern more prominent, it will be treated to prevent copper oxidation and sealed to improve the durability of the bronze mirror pattern.

9) Finished product inspection and display: Finally, after strict quality inspection to ensure that the carved patterns are fine, the proportions are coordinated, and the craftsmanship is exquisite, the bronze mirror can be displayed as a work of art.

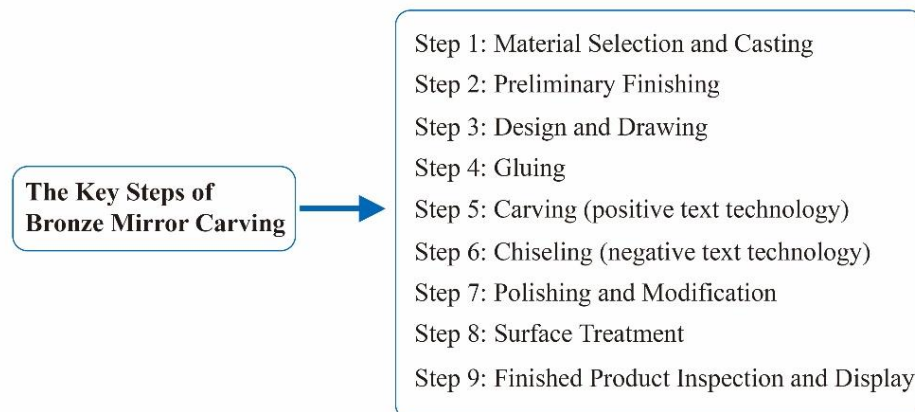


Figure 79 *Bronze mirror carving steps*

Note. Draw by the author, 2025

The bronze mirror carving and chiseling craftsmanship of Datong City not only flourished in the Song, Liao and Jin dynasties in ancient China, but also has important cultural value, artistic value and craft inheritance as an intangible cultural heritage in modern times. The bronze mirror carving and chiseling craftsmanship combines metal casting, carving, engraving and decorative art, fully demonstrating the excellent skills and unique aesthetic pursuit of craftsmen. It is one of the most representative art cultures of Datong City, Shanxi Province.

#### 4.2.4 DESIGN RESULTS OF BRONZE MIRROR DECORATIVE PATTERNS AND COMPARISON BETWEEN ANCIENT AND MODERN TIMES

##### 4.2.4.1 COMPARISON BETWEEN THE INNOVATIVE DESIGNS OF BRONZE MIRROR DECORATION PATTERNS IN ANCIENT AND MODERN TIMES

The researchers processed and compared the design results with historical pictures of bronze mirrors from the Song, Liao and Jin dynasties in ancient China, and we can clearly and intuitively see their evolution. The design results are affected by different craftsmanship, social culture and aesthetic concepts. With the development of craftsmanship, modern bronze mirror pattern design is innovative on the basis of inheriting traditional styles, mainly reflected in:

1) Simplification and linearization: Drawing on the basis of traditional pattern elements, using simple lines to express classic themes, making the decorative style more modern.

2) Multicultural integration: Combining ancient patterns, modern art forms are expressed to form new design patterns that blend ancient and modern.

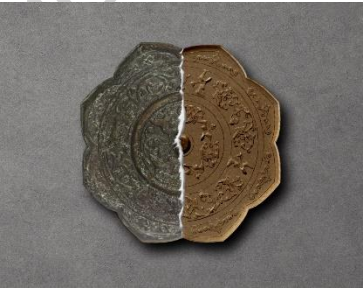

3) Functional expansion: Modern bronze mirrors are no longer limited to practical objects, but are more used in the development of art collection, decoration and cultural and creative product design.





Table 29 *Comparative Analysis of the Decorative Design Results of Ancient and Modern Bronze Mirrors*

Comparison Dimensions	Ancient traditional bronze mirror	Modern bronze mirror innovative design
Decorative style	Complex, symbolic, lack of agility	Modern aesthetics, emphasizing the recognizability and cognition of patterns, easy to be accepted by the public
Material selection	Mainly made of bronze	Mainly made of brass
Expression	Mainly depicting traditional auspicious patterns	Modern composition, standardization, updating of aesthetic elements, personalized design
Functional Positioning	Mainly for daily use and as a symbol of power	Artworks, cultural and creative design products, decorations

*Note.* Researchers draw their own, 2025

Table 30 *Comparison of ancient and modern bronze mirror decoration pattern design results*

No.	Name	Dynasty	Comparison design renderings
1	Diamond-shaped bronze mirror with flower and bird patterns	Song	
2	Double Fish Bronze Mirror	Jin	

3	Flower mirror	Liao	
4	Double Phoenix Mirror	Song	
5	Children and flower mirror	Song	
6	Buffalo and Moon Mirror	Jin	

*Note.* Researchers draw their own, 2025

Based on the characteristics of bronze mirror decoration patterns in the Song, Liao and Jin dynasties, researchers conducted a comparative analysis of ancient and modern patterns and conducted in-depth research on their modeling style, composition and cultural connotations. On this basis, they combined contemporary aesthetic trends to carry out innovative designs, giving new life to the traditional art form of bronze mirrors. Through the redesign of traditional patterns, bronze mirrors not only continue their profound historical and cultural value, but also show richer artistic expression in modern society.

#### 4.2.4.2 INNOVATIONS IN THE DECORATIVE PATTERNS OF BRONZE MIRRORS AND DISPLAY OF CARVING RESULTS

In the context of the increasingly diverse and in-depth development of cultural and creative design, the design results of this study reflect the following three aspects of innovation in terms of design concepts, design methods, and design practices:

1) Innovative design concepts of decorative patterns: the integration of traditional elements and modern elements. Chinese traditional design elements have profound cultural implications, condensing national history, philosophical thoughts and aesthetic art, and have a high degree of symbolism and cultural identity. In the context of contemporary design, the integration and innovation of traditional elements and modern elements is not only a reinterpretation and re-creation of local cultural resources, but also an important path to respond to social aesthetic transformation and cultural confidence construction. Through the modern translation of traditional patterns, composition, modeling and craftsmanship, design works can achieve cross-time and space dialogues at the level of form and meaning, retaining the continuity of cultural roots, and giving them new visual expressions and aesthetic values, thereby enhancing the cultural recognition and public acceptance of the works. This integration not only promotes cultural innovation in design, but also reflects the inheritance and continuation of traditional culture in the contemporary context.

2) Innovative design methods of decorative patterns: the combination of shape grammar design theory. The introduction of Shape Grammar design theory provides theoretical support and operational path for the systematic reconstruction of traditional elements. This study combines the element characteristics and composition rules of bronze mirror decorative patterns, comprehensively analyzes its symbolic attributes and composition logic, and selects Shape Grammar design theory as the core methodology. By extracting the basic morphological elements of the pattern and summarizing the structural relationship, a set of shape grammar generation rules suitable for bronze mirror decorative patterns is constructed, and the design formula is derived based on this to achieve the structural evolution of traditional patterns and the generation of creative patterns. This method not only gives new possibilities to traditional graphics, but also promotes the transformation of pattern design from empirical creation to rule-driven innovation mode, and finally produces a new bronze mirror decorative pattern design result with originality and modern aesthetic value.

3) In the practice of innovative design of decorative patterns: the combination of intangible cultural heritage bronze carving skills. In the selection of carriers for innovative design of decorative patterns, this study integrates modern design results with the local intangible cultural heritage of Datong City, Shanxi Province - bronze carving skills, to explore the interaction between traditional crafts and contemporary expression. As an important representative of China's intangible cultural heritage, bronze sculpture has high artistic value and cultural significance. However, the number of inheritors of this skill has dropped sharply. By applying the original bronze

mirror decorative patterns to bronze sculpture carriers with intangible cultural heritage attributes, this study not only realizes the transformation of decorative patterns from two-dimensional vision to three-dimensional craftsmanship, and enhances the material expression and cultural depth of the design results, but also promotes the contemporary expression and artistic value of traditional bronze sculpture skills at the level of design practice. This fusion method provides a new path for the living inheritance of intangible cultural heritage skills, helps to stimulate the vitality of traditional crafts in the context of contemporary design, and establishes sustainable connections in cultural inheritance.

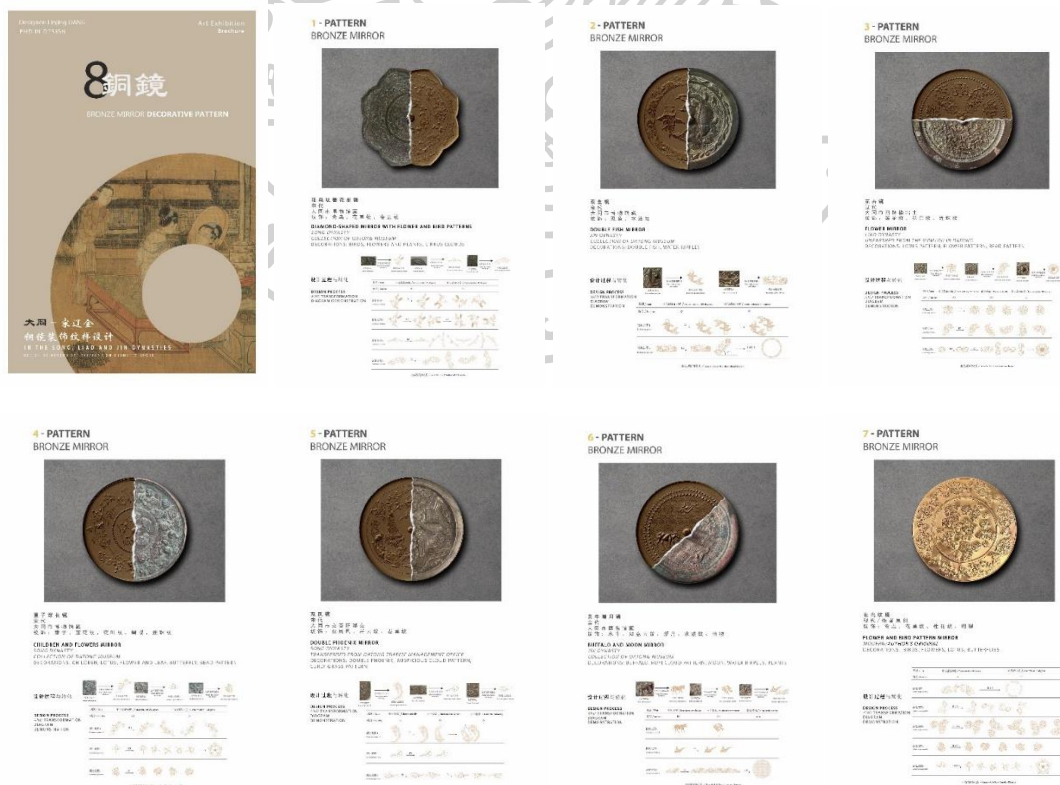
The picture below shows a modern bronze mirror art work completed by researchers in collaboration with inheritors of the intangible cultural heritage bronze carving technique and masters of arts and crafts. Based on the inheritance of the artistic characteristics of decorative patterns in the Song, Liao and Jin dynasties, this work combines modern design concepts and formal language to vividly display the visual charm and cultural connotation of traditional patterns. By refining, reorganizing and innovatively applying historical pattern elements, it not only gives them contemporary aesthetic significance, but also achieves high-quality transformation from design concept to physical work with the help of the exquisite craftsmanship of intangible cultural heritage bronze carving techniques. This artwork effectively promotes the modern transformation of traditional decorative patterns and the revitalization and inheritance of intangible cultural heritage, embodies the bridge role of design in the reproduction of historical culture, and provides a model with both academic and practical value for contemporary design.



Figure 80 *Bronze mirror decorative pattern innovative design*  
 Note. Photographed by the researcher, 2025

## 4.2.5 DESIGN MANUAL

Based on the systematic presentation of the design results, the researchers designed a supporting brochure around the art exhibition activities, aiming to provide visitors with a comprehensive and clearly structured introduction. The content of the brochure covers the basic information of the design, the creation process, the extraction and analysis of pattern elements, the picture comparison of traditional and modern bronze mirror patterns, the carving process of bronze carving technology, and the presentation of the final results, which not only enhances the audience's understanding of the design concept and practice process, but also enhances the professionalism and educational function of the exhibition. In order to further expand the communication path and interactive experience, the researchers set a video QR code on the back cover of the brochure. The audience can directly watch the process of the researchers and the intangible cultural heritage inheritors working together to complete the carving process by scanning the QR code with their mobile phones, so as to have a deeper understanding of the practical significance of the integration of intangible cultural heritage skills and modern design. This strategy effectively enriched the display form of the design results, strengthened the audience's sense of immersion and participation, and also reflected the diversified value of design communication in cultural performances. The following figure shows the picture content of the brochure designed by the researchers.



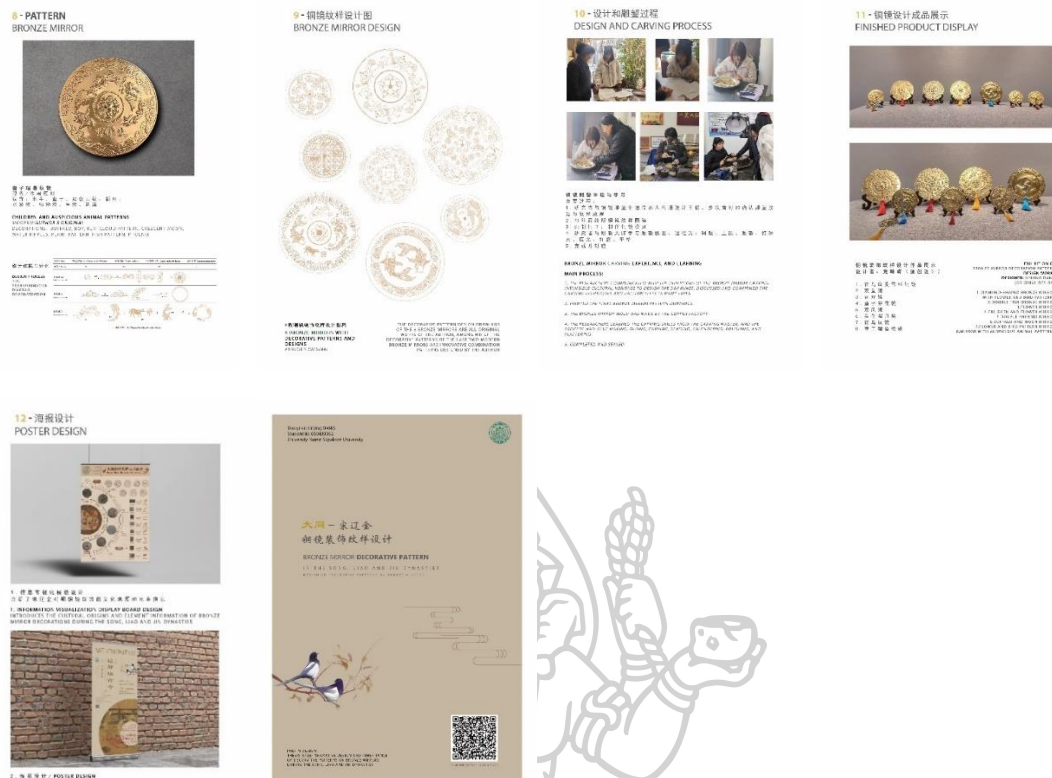


Figure 81 *Design Manual*  
 Note. Original design by the author, size: B5, 2025

#### 4.2.6 POSTER DESIGN AND INFORMATION VISUALIZATION DESIGN

In order to enhance the visual presentation effect and information communication efficiency of the exhibition of innovative design of decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, the researchers planned and designed the information visualization exhibition section in advance as an important part of the exhibition. Through systematic information integration and visual expression, this section comprehensively presents the historical origins, pattern design sources, element extraction logic and modern transformation results of bronze mirrors in the Song, Liao and Jin dynasties. The researchers scientifically and artistically designed the layout and graphic layout of the exhibition board in combination with the exhibition content, so that historical materials, images, design element extraction sources and processes can be presented in an intuitive and visual way at the exhibition site, effectively improving the audience's visual experience and cognitive efficiency. This information visualization design not only enriches the content level and communication dimension of the exhibition, but also reflects the extended value of this design result in display planning and cultural communication, and is an important bridge connecting academic research and public communication.



In addition, poster design, as an important part of the visual communication of the exhibition of this research result, is also an indispensable part of the overall research system. In the creation of the poster, the researcher selected a unified design style that is consistent with the design results and theme of this study, combined with the typical elements of the bronze mirror patterns of the Song, Liao and Jin Dynasties and the traditional Chinese color system, to create a strong atmosphere of ancient culture and art, and strengthen the visual recognition and cultural connotation expression of the exhibition. This promotional poster not only undertakes the basic functions of information transmission and audience guidance, but also expands the influence of the exhibition in the communication path, and stimulates the public's attention and interest in ancient Chinese decorative art and intangible cultural heritage. Through the visual language of poster design, the artistic charm of the Song, Liao and Jin bronze mirror patterns in Datong area is effectively displayed, becoming an important communication medium connecting traditional cultural art with the aesthetic experience of contemporary audiences. The figure below is the exhibition poster designed by the researcher.



Figure 84 *Poster Design*

Note. Original design by the author, Size: 80cm\*180cm, 2025

#### 4.2.7 SUMMARY

This section systematically combs the whole process of this study from the construction of design theory to the design practice and the presentation of results, reflecting the rigor of the design logic and the innovation of the results. First, through the construction of the basic rules of shape grammar, the pattern generation rules are established, which provides structural support for the design of this study; then, through the extraction and analysis of the elements of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties, the systematic identification and semantic analysis of traditional cultural symbols are realized, laying the foundation for the modern transformation of patterns. On this basis, the researchers also elaborated on the innovative design strategies and carving process of bronze mirror patterns, reflecting the transformation path of design results from two-dimensional graphics to three-dimensional objects and their deep integration with intangible cultural heritage technology.

The researchers further intuitively demonstrated the dual value of design results in inheritance and innovation through the visual comparison design of ancient and modern patterns and the physical presentation of carving results, and analyzed the key innovations in the design. Focusing on the exhibition communication level, this section also introduces the compilation of design manuals, poster design, and information visualization display board design results, which not only enriches the presentation dimension of design results, but also expands its social communication effectiveness. Overall, the content of this section establishes a clear and organic connection between theoretical analysis and design practice, reflecting the methodological exploration, technical paths and communication strategies in the modern transformation of bronze mirror decorative patterns during the Song, Liao and Jin dynasties. It has high academic reference value and practical promotion significance.

#### 4.3 DESIGN EXHIBITION AND SATISFACTION SURVEY RESULTS

This study aims to explore the cultural connotation, innovative design and artistic inheritance of bronze mirror decorative patterns during the Song, Liao and Jin dynasties, to showcase the characteristics and aesthetics of local urban art culture in art exhibitions and art activities, to reflect the aesthetic trends of modern decorative patterns, and to verify the theoretical basis through audience participation and feedback. The researchers collected feedback data through questionnaires and on-site interviews, analyzed the collected data, and found that the audience had a strong interest in the innovative design results of bronze mirror decorative patterns during the Song, Liao and Jin dynasties, and the overall response was positive, and the collected data also showed a wide range of diversity and adaptability.

#### 4.3.1 OVERVIEW AND RESULTS OF EXHIBITION ACTIVITIES

In April 2025, researchers held an offline design exhibition at the Datong Art Museum in Shanxi Province, China, to show the audience the overall design plan and research results. Datong Art Museum is the largest and most visited art exhibition venue in Datong City, covering an area of 77 acres, with a construction area of 32,238.5 square meters and a ground building height of 26 meters. It was designed by the world-renowned British Foster Architects and China Architecture Design Institute, with novel concepts and complete functions. The main body of the art museum is an all-underground structure, with a steel structure space truss system on the upper part. One of the most unique design elements of this venue is the pyramid-like geometric shape. Two pairs of pyramids are arranged in a dynamic and gradually rising manner to form a spacious and magnificent huge exhibition hall, which can be used to place various types and super-large artworks. For the exhibited artworks, this architectural form can not only provide a strongly contrasting background for the exhibition space, but also allow the building itself to be integrated into the art exhibition, allowing the target group to feel the visual effects brought by the venue while viewing the artworks.



Figure 85 *Datong Art Museum*  
 Note. Photographed by the researcher, 2025

This design exhibition was held in the Intangible Cultural Heritage Exhibition Hall in Datong Art Museum. As a future-oriented art museum, Datong Art Museum provides different types of exhibition halls, each of which can operate independently and hold 7 to 8 different art events at the same time. The design results of the bronze mirror decorative pattern in this study are presented through the intangible cultural heritage carving and chiseling techniques, which are part of the intangible cultural heritage. Therefore, it is held in the intangible cultural heritage exhibition hall. The choice of the exhibition location ensures maximum exposure and public participation.

After entering the art museum, visitors can enter the intangible cultural heritage exhibition hall to view the collections. The exhibition hall can accommodate various design displays, information display board visualization designs and interactive videos to experience the process of bronze mirror decorative pattern design and the carving and chiseling techniques of intangible cultural heritage, allowing visitors to enter the

artistic culture of bronze mirror decorative patterns from the senses of vision, hearing and touch, and immerse themselves in the artistic atmosphere of the fusion of intangible cultural heritage and modernity.



Figure 86 *The Intangible Cultural Heritage Exhibition Hall of Datong Art Museum*  
 Note. Photographed by the researcher, 2025

The exhibition combines static and dynamic visual elements, and uses multimedia to present them together, creating a unique historical and artistic atmosphere to attract visitors. The visual design of the exhibition harmoniously integrates traditional elements with modern aesthetics, modern carving materials with traditional techniques, and shows the unique artistic charm of the decorative patterns of bronze mirrors in Datong City during the Song, Liao and Jin Dynasties in China. The design of the patterns fully reflects the significance of innovation and inheritance, arousing the strong interest of tourists and their sense of identity with culture and art, and enhancing the appeal of this art exhibition. By displaying the artistry of bronze mirror patterns, this exhibition cultivates the public's sense of identity with Chinese traditional culture and art, and plays a very important role in inheriting China's intangible cultural heritage and bronze mirror pattern art.





Figure 87 Some photos of the exhibition  
 Note. Photographed by the researcher, 2025

The exhibition of innovative designs of bronze mirror decoration patterns from the Song, Liao and Jin dynasties was highly recognized by local residents and tourists. The exhibition was held during a Chinese statutory holiday and attracted a large number of the public and tourists. In addition, collectors and students also visited the exhibition, all of whom showed great interest and enthusiasm in the innovative designs of bronze mirror decoration patterns from the Song, Liao and Jin dynasties. The researchers displayed the bronze mirror decoration pattern design works in the interactive exhibition area for interactive exchanges with tourists, and collected public opinions and satisfaction data.





Figure 88 Photos of some visitors at the design exhibition

Note. Photographed by the researcher, 2025

According to the feedback from the public at the design exhibition, the visual design, historical information display, and carving process demonstration of this exhibition effectively demonstrated the artistic characteristics and cultural connotations of the decorative patterns of Datong bronze mirrors, which plays an important role in the inheritance of intangible cultural heritage. The immersive visual display form resonated with the public, aroused strong cultural confidence and emotional enthusiasm, and strengthened the cultural pride of tourists and the public.

#### 4.3.2 IMPLEMENTATION AND FEEDBACK OF ART ACTIVITIES

After the researchers exhibited their works in the intangible cultural heritage exhibition hall of Datong Art Museum, they invited tourists to participate in the bronze mirror rubbing activity to experience the charm of Chinese rubbing art and deeply feel the design effect of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties. The researchers collected feedback data for collation.

Rubbing is one of China's intangible cultural heritages. The so-called "rubbing", also known as "stone rubbing art", is an art form that uses special ink and paper to copy or record natural or artificial text, patterns or textures engraved on the surface of various materials. Rubbing has a long history and has been recorded as early as the Han Dynasty. As a traditional handicraft, rubbing requires a long period of study and practice to master. With the rise of epigraphy in the Northern Song Dynasty, rubbing techniques have played a more critical role in preserving and inheriting cultural relics, and precious rubbings have even reached the point where they are hard to find. The application range of rubbing techniques is extremely wide. Its rubbing objects include not only oracle bones, stele inscriptions, tiles, wood carvings, etc., but also extend to bronze mirrors, Buddhist statues, etc. These rubbings not only carry rich historical information, but also reflect many aspects of ancient social life, such as history, geography, politics, economy, military, folklore, literature and art. Because of this, rubbing techniques play an indispensable role in the preservation and dissemination of ancient culture. To this day, this technique still plays an important role in many fields such as cultural relics, archaeology, and arts and crafts.

The main implementation steps of bronze mirror rubbing activities:

- 1) Preparation of materials and tools. Rice paper, plastic paper, ink tray, ink box, ink, various sizes of rubbing bags, spray pot, brush
- 2) Cut rice paper and plastic paper into a square slightly larger than the bronze mirror
- 3) Place rice paper in the center of the bronze mirror, gently press the spray pot to wet the rice paper, and adjust the rice paper to make it flat
- 4) Place plastic paper on the wet rice paper, and use a brush to brush from the center to the edge to remove bubbles and make the rice paper fit closely with the bronze mirror
- 5) Wait for ten minutes to let the rice paper dry slightly
- 6) Pour an appropriate amount of ink on the ink box, dip a little ink with the rubbing bag, and gently pat the rubbing on the ink tray to make the ink even
- 7) Rub lightly on waste paper to make the ink color lighter until it reaches the color depth you want
- 8) Start from the center of the bronze mirror and rub evenly around. Repeat step 7 after each dip to control the ink color
- 9) After rubbing, peel off the rice paper and the rubbing is complete
- 10) Stamp and mount



Figure 89 *The main steps of rubbing implementation*  
 Note. Photographed by the researcher, 2025

The following pictures show some photos of the experience activities implemented by the researchers in the rubbing art studio. The researchers and participants had a deep experience and feedback on the results of the design works.



Figure 90 *Some photos of the rubbing art studio experience activity*  
 Note. Photographed by the researcher, 2025

The researchers set up the art activity of rubbing bronze mirrors to innovate in inheritance, combining the innovative design of bronze mirror patterns with the bronze mirror rubbing art activity, so that the public and tourists can feel and experience Chinese intangible cultural heritage more deeply, and more accurately evaluate and feedback on this pattern design, providing reliable data and information support for this study.

The researchers focused on interviewing the public and tourists who participated in the rubbing art experience activity, and evaluated the results of the innovative design works of bronze mirror decorative patterns. The researchers organized the information and feedback as follows:

Table 31 *Feedback Form for the Rubbing Art Experience Activity*

No.	Keywords	Feedback
1	Decorative patterns	The pattern design is artistic and vivid
2	Carving Technique	Rich carving techniques and clear layers
3	Materials	Modern brass is easier to carve into detailed lines than ancient bronze, making it a good fit for the design results of this study.
4	Cultural Connotation	You can clearly feel the traditional Chinese auspicious meaning reflected in the bronze mirror pattern
5	Artistic Background	Able to attract the public's interest in the background of art
6	Ancient and modern heritage	Able to experience the modern inheritance of ancient culture in modern rubbing activities
7	Rubbing effect	The method of rubbing activities plays a role in inheriting and developing intangible cultural heritage.
8	Storage method	The development of modern technology makes the preservation of artworks more convenient
9	Emotional resonance	The design results of this study can arouse the public's emotional resonance with traditional Chinese art and culture, and experience and feel the charm of bronze mirror art from the Song, Liao and Jin dynasties in ancient China.
10	Innovation	The pattern design of this study has certain innovation, but its ancient heritage can also be seen. In terms of inheritance and development, it is implemented by combining rubbing art, which also reflects innovation.

*Note.* Researchers draw their own, 2025

The combination of rubbing art experience activities and innovative design of bronze mirror decorative patterns is innovative, enriching the new form of Chinese

traditional cultural creative design, emphasizing the significance of this study, and promoting the inheritance of Chinese cultural and artistic heritage and the development of intangible cultural heritage. At the same time, the design results of this study aroused the public's emotional resonance, strengthened the dissemination of local culture, and enhanced the public's sense of national pride.

#### 4.3.3 ANALYSIS OF AUDIENCE SATISFACTION SURVEY RESULTS

This study aims to explore the modern innovative design methods of bronze mirror decorative patterns during the Song, Liao and Jin dynasties and the inheritance of traditional Chinese art and culture. The researchers inherited and carried forward the bronze carving skills and rubbing art of China's intangible cultural heritage by displaying bronze mirrors with innovative design patterns. They also analyzed the collected data information through audience participation, experience and feedback verification, and found that the design results of bronze mirror decorative patterns showed a wide range of diverse feedback. The findings of this study will help promote the promotion of local culture and art, provide the public and tourists with a better understanding of bronze mirror patterns, expand the design methods and theories in the field of art design, and provide a cross-research perspective for the inheritance of intangible cultural heritage.

Table 32 *Analysis of the age of exhibition visitors*

Options	Subtotal	Proportion
Under 18	34	14.3%
18-25 years old	77	32.5%
26-45 years old	96	40.5%
46-60 years old	22	9.3%
Over 60 years old	8	3.4%
Number of valid entries for this question	237	

*Note.* Researchers draw their own, 2025

The table 31 above is an age analysis of the audience of the exhibition, showing the age distribution of the public participating in the exhibition. The data shows that the main age group is 18-45 years old, accounting for 73%. People of different age groups have different interests and preferences. The difference in age will affect the public's satisfaction, understanding and active participation in the innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties. The implementation of this exhibition also takes into account the public's age preferences and habits.

Table 33 *Analysis of the educational level of the exhibition public*

Options	Subtotal	Proportion
Primary school and below	9	3.8%
Junior high school	14	5.9%

High School/Technical secondary	30	12.7%
University/Undergraduate	106	44.7%
Graduate degree or above	78	32.9%
Number of valid entries for this question	237	

*Note.* Researchers draw their own, 2025

The table 32 above clearly outlines the distribution of education levels of the exhibition visitors. Analyzing the education level of the exhibition participants helps to understand their awareness and acceptance of the exhibition content. By interviewing audiences with different educational backgrounds, we can measure their understanding, cognition and effectiveness of cultural information transmission of the design results of this study. The table shows that visitors with college and postgraduate education account for 77.6%. This shows that visitors with higher education are more interested in and more likely to resonate with the design results of this study. Overall, investigating and understanding the diversity of education levels can make this exhibition more targeted, allowing more audiences to experience and participate in the activities of bronze mirror decorative patterns, and deeply feel the artistic charm of traditional intangible cultural heritage and pattern design.

Table 34 *Cross analysis table of audience satisfaction and age*

Age	Very Dissatisfied	Dissatisfied	General	Satisfy	Very Satisfied	Total
Under 18	0(0.00%)	0(0.00%)	2(5.88%)	17(50.00%)	15(44.12%)	34
18-25	0(0.00%)	0(0.00%)	0(0.00%)	43(55.84%)	34(44.16%)	77
26-45	0(0.00%)	0(0.00%)	17(17.71%)	28(29.17%)	51(53.12%)	96
46-60	0(0.00%)	0(0.00%)	1(4.54%)	7(31.82%)	14(63.64%)	22
Over 60	0(0.00%)	0(0.00%)	2(25.00%)	1(12.50%)	5(62.50%)	8

*Note.* Researchers draw their own, 2025

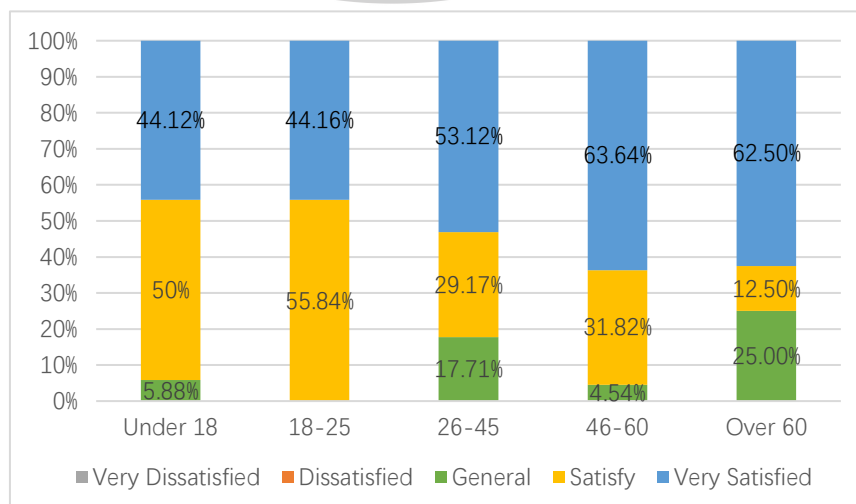


Figure 91 *Cross-analysis bar chart of audience satisfaction and age*  
*Note.* Researchers draw their own, 2025

The above chart 33 provides clear data on the overall satisfaction of audiences of different age groups with the design results of this study, allowing us to understand the perception and feedback of audiences of different age groups on design exhibitions. Through the analysis of survey data, it is helpful to optimize the strategy of future design research and exhibition implementation. The survey results show that respondents of all age groups expressed high satisfaction with the design exhibition experience of this study.

Table 35 *Cross-analysis table of the visual design satisfaction of exhibition results and the educational level of the audience*

Dimension	Primary school and below	Junior high school	High School/ Technical secondary	University/ Undergraduate	Graduate degree or above
Pattern Design	89%	71%	90%	98%	91%
Composition	81%	80%	84%	94%	89%
Information Visual Design Display	75%	79%	86%	89%	93%
Manual Design	74%	80%	88%	95%	94%
Experience Feeling	87%	81%	89%	91%	90%

*Note.* Researchers draw their own, 2025

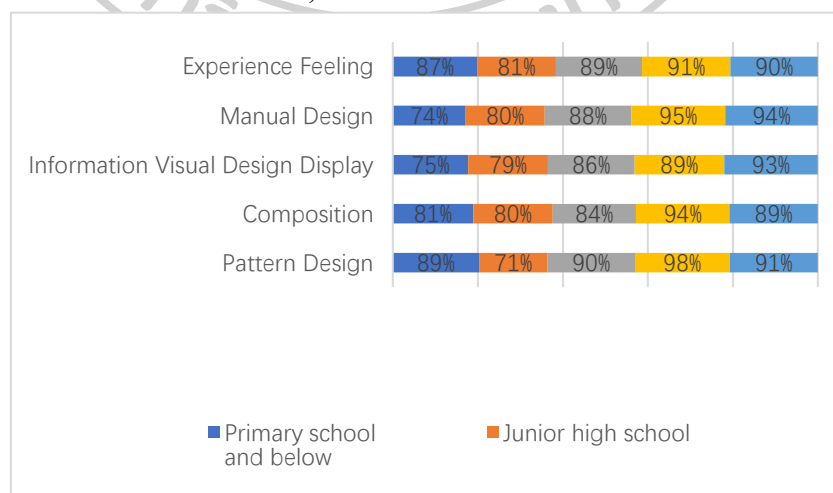


Figure 92 *Satisfaction with the visual design of exhibition results and the educational level of the audience*

*Note.* Researchers draw their own, 2025

The above chart 34 shows the distribution of satisfaction of participants in exhibitions and activities with the innovative design results of decorative patterns on bronze mirrors in the Song, Liao and Jin dynasties among people with different educational levels. The data shows that people with different educational levels all have a high evaluation of the design results of this study. Satisfaction analysis was conducted from different dimensions. The results showed that people with less than college education were more satisfied with the pattern composition and experience. People with a bachelor's degree or above were more satisfied with the manual design, information visualization display board design, and pattern design. These research results reflect that audiences with different educational levels have different focuses on the results of this study, and also provide references and insights for future in-depth exploration of this study.

Table 36 *Can this exhibition allow the audience to feel the historical and cultural connotations and artistic charm of the bronze mirror decorative patterns*

Age	Yes	No	Total
Under 18	33(97.05%)	1(2.95%)	34
18-25 years old	77(100.00%)	0(0.00%)	77
26-45 years old	89(92.71%)	7(7.29%)	96
46-60 years old	22(100.00%)	0(0.00%)	22
Over 60 years old	7(87.50%)	1(12.50%)	8

Note. Researchers draw their own, 2025

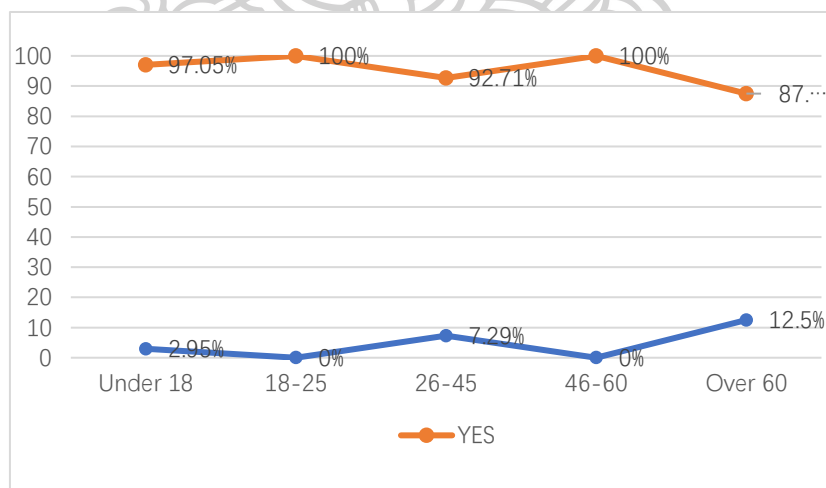


Figure 93 *Line chart showing the survey results of satisfaction of visitors of different age groups with the exhibition*

Note. Researchers draw their own, 2025

The above table 35 shows the satisfaction survey results of audiences of different ages on whether they can feel the historical and cultural connotations and artistic charm of the bronze mirror decorative patterns in this exhibition. As can be seen from the chart, most of the audience felt the cultural connotations and artistic charm of the bronze mirror decorative patterns in the Song, Liao and Jin dynasties through this

exhibition, and only a small number of audiences did not feel the cultural connotation, which is largely due to age factors. In general, this exhibition can enhance the audience's dissemination and cognition of the cultural background, connotation, and artistry of bronze mirrors, and expand the channels for cultural heritage inheritance. The respondents also experienced and felt the artistic charm and intangible cultural heritage in the exhibition and activities, and enhanced their national self-confidence and pride.

Table 37 From the audience's perspective, there are areas where decorative pattern design and exhibition design need to be improved

	Add interactive multimedia devices	Creative development of cultural and creative products	Add live rubbing experience activities	Increase exhibition publicity	Enrich exhibition information	Total
Under 18	81%	65%	91%	17%	9%	34
18-25	78%	80%	74%	15%	22%	77
26-45	64%	78%	77%	29%	14%	96
46-60	46%	32%	69%	71%	74%	22
Over 60	11%	40%	88%	76%	83%	8

Note. Researchers draw their own, 2025

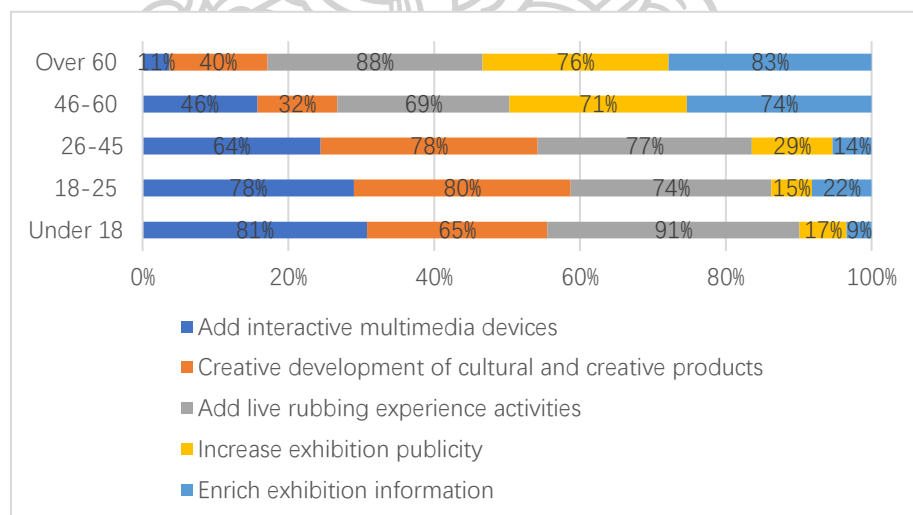


Figure 94 Opinions on the need for improvement in the design and exhibition design

Note. Researchers draw their own, 2025

The above chart 36 shows the survey results of opinions on the decorative pattern design and exhibition design parts of this research results that need to be improved from the perspective of the audience. The results show that young groups, such as audiences under 18 years old, 18-25 years old, and 26-45 years old, pay more attention to adding interactive multimedia equipment, the development of cultural and

creative product design, and the on-site implementation of rubbing art experience activities. Older audiences, such as audiences aged 46-60 and over 60 years old, focus on increasing the publicity of the exhibition and enriching the information transmission of the exhibition. In general, different audiences have different focuses on the suggestions of this research result, but most of the audiences are interested in the bronze mirror rubbing art experience activities. These survey results prove the importance of regularly collecting feedback for this research. These data can guide the iteration and update of future design exhibitions and ensure that the research results are attractive to audiences of different ages.

In summary, by collecting the opinions of audiences of different ages on this research result and exhibition, researchers can have a deeper understanding of the inheritance and planning of future design and exhibition activities of bronze mirror decorative patterns, and effectively promote the protection and development of intangible cultural heritage.

Table 38 Satisfaction survey on bronze mirror rubbing art experience activity

Age	Very Dissatisfied	Dissatisfied	General	Satisfy	Very Satisfied	Total
Under 18	0(0.00%)	0(0.00%)	1(14.28%)	3(42.86%)	3(42.86%)	7
18-25	0(0.00%)	0(0.00%)	0(0.00%)	15(57.69%)	11(42.31%)	26
26-45	0(0.00%)	0(0.00%)	4(16.66%)	7(29.17%)	13(54.17%)	24
46-60	0(0.00%)	0(0.00%)	1(8.33%)	7(58.34%)	4(33.33%)	12
Over 60	0(0.00%)	0(0.00%)	0(0.00%)	1(100.00%)	0(0.00%)	1

Note. Researchers draw their own, 2025

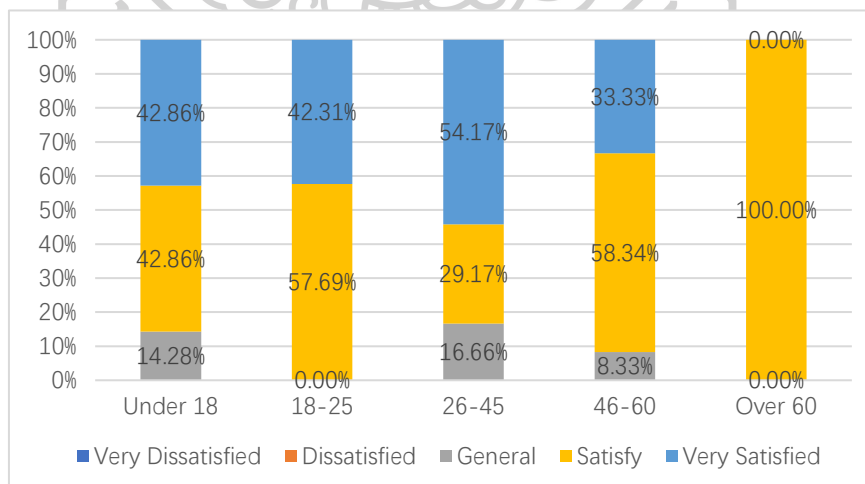


Figure 95 Bar chart of audience satisfaction survey on bronze mirror rubbing art experience activity

Note. Researchers draw their own, 2025

As can be seen from the above chart, the overall satisfaction of the audiences of all ages in the bronze mirror rubbing art experience activities of the bronze mirror rubbing studio is relatively high. Among them, very dissatisfied and dissatisfied accounted for 0%, and satisfied and very satisfied accounted for a large proportion. From the above data, it can be concluded that this bronze mirror rubbing art experience activity received very good audience satisfaction feedback. It is a new way of inheritance for the cross-research and display of the intangible cultural heritage of bronze mirror rubbing art, the intangible cultural heritage of bronze mirror carving and chiseling, and the innovative design of bronze mirror decorative patterns. It is helpful to promote China's excellent traditional culture, inherit the intangible cultural heritage art, and increase national pride.

#### 4.3.4 SUMMARY

This summary mainly covers three aspects: design exhibition, rubbing experience activities and audience satisfaction survey results. It comprehensively outlines the exhibition overview and form of the innovative design results of the decorative patterns of Song, Liao and Jin bronze mirrors, shows the implementation process of the bronze mirror rubbing art experience activities, strengthens the publicity of intangible cultural heritage, and enriches the satisfaction data of the bronze mirror pattern design results. The survey results show that the overall audience satisfaction and recognition are very high, attracting audiences of different ages and educational levels. Visitors not only participate in static exhibitions to appreciate the artistic beauty and innovation of bronze mirror patterns, but also participate in feedback and discussion interactive exhibitions, and experience bronze mirror rubbing art activities. Overall, the design exhibition effectively connects the target audience. This exhibition and activity successfully embody the essence of local art and culture, highlights the artistry and innovation of decorative patterns, enhances national pride and self-confidence, and promotes the inheritance of Chinese intangible cultural heritage art.

#### 4.4 SUMMARY OF THIS CHAPTER

Chapter 4 systematically presents the whole process of innovative design, exhibition results, practical activities and design results satisfaction survey results of this study on the decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties, covering multiple levels such as preliminary data research and strategy formulation, exploration of design methods based on shape grammar, modern design results of decorative patterns and bronze mirror carving practice process, related visual communication design and feedback analysis of exhibition activities. The study obtains design inspiration and needs from multi-dimensional and multi-subject participation, constructs an innovative path with cultural depth and design logic

support, and provides an effective research paradigm for the contemporary expression of traditional Chinese decorative pattern art.

First, through the analysis of the research results in four forms of questionnaire survey, field research, expert interview and art design workshop, the public's cognitive basis and aesthetic appeal for traditional bronze mirror patterns were clarified, the potential value of bronze mirror cultural communication was mastered, and the suggestions of experts on graphic innovation design and carving technology were absorbed. This stage of research not only provides an important reference basis for the design plan, but also lays a data foundation for the rationality and acceptance of subsequent design content.

Secondly, combined with the shape grammar design theory, the study constructed a generation rule system suitable for the innovation of bronze mirror decorative patterns, realizing a systematic design process from pattern element extraction to structural logic reconstruction. On this basis, the design results are further integrated with the intangible cultural heritage bronze carving craftsmanship, and implemented as physical art works of carving and chiseling, reflecting the activation and inheritance of traditional skills. The generation of patterns no longer relies on subjective experience, but realizes logical rules through the design theory of shape grammar, which effectively improves the scientific and creativity of the design and promotes the development of bronze mirror decorative pattern design in a modern and systematic direction.

In addition, at the level of achievement dissemination, the researchers constructed a three-dimensional exhibition dissemination system through various media means such as design manuals, posters, and information visualization panels. This not only enhances the audience's immersion and information acquisition efficiency at the exhibition site, but also expands the cultural dissemination effect of the design results. The video design of the carving process can be viewed by scanning the QR code on the mobile phone, which enables the traditional craftsmanship to be visualized and interactively experienced, improves the perceptibility and cognition of intangible cultural heritage, and promotes the public's in-depth understanding of the cultural value behind traditional craftsmanship.

Finally, by carrying out design art exhibitions and interactive rubbing experience activities, combined with the results of satisfaction survey analysis, this study further verified the acceptance effect and cultural communication value of design results at the public level. The audience generally recognized and satisfied the modern design of bronze mirror decorative patterns, and the reproduction and participation of intangible cultural heritage skills enhanced cultural confidence and aesthetic experience.

In summary, Chapter 4 not only shows the complete design process from theoretical research to design practice and exhibition activities, but also reflects the ability of traditional culture to recreate in the contemporary context, effectively achieving the dual goals of inheritance and innovation, and providing a theoretical framework and practical path for future related design research.

## CHAPTER 5

### CONCLUSIONS DISCUSSION AND RECOMMENDATION

Chapter 5 systematically summarizes the multi-dimensional design practice and theoretical exploration carried out in the first four chapters of this study, and emphasizes the innovation and inheritance path of the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties in China in the context of contemporary design. By combining the shape grammar design theory with the traditional bronze mirror patterns, the study achieves the structured analysis and innovative regeneration of ancient decorative pattern elements, enriching the scientific method of modern generation of traditional images. At the same time, with the deep integration of the two intangible cultural heritages of Datong bronze sculpture and Chinese rubbing art, the study explores the artistic expression in the practice process, expands the design boundaries of decorative patterns at the level of cultural heritage dissemination and inheritance, and constructs a new innovative method and inheritance form that combines traditional cultural depth with modern design logic.

The research conclusion points out that the research results not only achieve a breakthrough in traditional and modern aesthetics in the reconstruction of decorative pattern graphics, but also open up a new path for cultural revitalization in the integrated application of intangible cultural heritage crafts. The design results not only enrich the expression form of innovative design of Chinese traditional patterns, but also provide theoretical support and practical samples for the digital translation and contemporary expression of traditional patterns, showing the regeneration ability of Chinese traditional pattern art in the contemporary design system. While promoting the creative transformation and innovative development of intangible cultural heritage, this study has contributed new ideas and paths to the dissemination and sustainable inheritance of China's cultural and artistic heritage.

#### 5.1 CONCLUSIONS

##### 5.1.1 SYSTEMATIC STUDY ON INNOVATIVE DESIGN OF BRONZE

##### MIRROR DECORATIVE PATTERNS

The research content of innovative design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties collected a large amount of image data of ancient traditional bronze mirror decorative patterns as support, and analyzed and summarized the composition and artistic evolution of bronze mirror decorative patterns in different periods. This study completed the historical development, social background, value analysis, philosophical thoughts and functions, composition and layout, content and classification, pattern characteristics, historical status and

influence, and application status analysis of bronze mirror decorative patterns in the Song, Liao and Jin dynasties in China. In order to ensure the integrity and accuracy of the data, the researchers adopted a research method that combines literature research, field investigation, expert interviews, and questionnaire surveys. After investigations and evidence collection in many places, the data and pictures of necessary information complement each other and summarize each other, which provides a guarantee for the research results of innovative design of bronze mirror decorative patterns.

### 5.1.2 COMBINATION OF SHAPE GRAMMAR DESIGN THEORY AND RULE GENERATION

The shape grammar design theory was first used in painting, sculpture and architectural design, and later widely used in the fields of graphic design and industrial design. It mainly changes the shape elements so that the elements are deduced according to certain rules, and the generated new elements have certain inheritance of the properties of the original elements.

Shape grammar is a research method based on shape operations, which uses symbolic shapes as basic elements and uses grammatical structures to analyze and generate new shapes. Shape grammar can be used as a design language to create new graphic forms, and can also be used to analyze the forms of existing designs. It is both generative and analytical. This study uses this design theory to analyze the element information and composition rules of the original bronze mirror decorative patterns, and the process of generating new patterns from shape elements according to the reasoning rules designed by the researcher. Therefore, the advantage of shape grammar is that the procedure is clear and easy to understand. This study is based on a series of shape rules to create and analyze, and can generate innovative pattern compositions and combination patterns from several known groups of shapes, and through the repeated application of limited rules and graphic elements, innovative bronze mirror decorative pattern designs are obtained.

### 5.1.3 RESEARCH ON THE INTEGRATION OF BRONZE MIRROR CARVING AND CHISELING TECHNIQUES WITH INTANGIBLE CULTURAL HERITAGE

The bronze carving and chiseling craft is a representative characteristic skill of Datong City, Shanxi Province, China. It was listed as the fourth batch of national intangible cultural heritage representative projects in 2014. Due to its high technical difficulty, craftsmen engaged in this craft must have a certain aesthetic sense, and at the same time have a basic understanding of painting, design and sculpture, and must master the basic skills of benchwork. Nowadays, there are very few bronze mirror

carving and chiseling craftsmen. In order to protect the sustainable development and inheritance of culture, the researchers conducted field investigations and combined expert interviews and practical research methods with intangible cultural heritage inheritors, experts and arts and crafts masters for many discussions and consultations. The researchers combined the two for the innovative patterns designed by the researchers. The design results not only implement the physical art works of innovative design of decorative patterns, but also reflect the activation and inheritance of the bronze carving and chiseling craft, an intangible cultural heritage.

#### 5.1.4 RESEARCH ON THE INTEGRATION OF RUBBING ART ACTIVITIES WITH INTANGIBLE CULTURAL HERITAGE

Rubbing is one of China's intangible cultural heritages, known as "stone rubbing art". It is an art form that uses special ink and paper to copy or record natural or artificial text, patterns or textures engraved on the surface of various materials. Rubbing techniques have played a key role in preserving ancient bronze mirrors. Precious rubbings are even worth a fortune and have high historical, economic and artistic value.

By setting up the art activity of rubbing bronze mirrors, the researchers combined the innovative design of bronze mirror patterns with the bronze mirror rubbing art activity, allowing the public and tourists to feel and experience China's intangible cultural heritage more deeply, and more accurately evaluate and feedback on this pattern design, providing reliable data and information support for this study. The combination of rubbing art experience activities and innovative design of bronze mirror decorative patterns is innovative, enriching the new form of Chinese traditional cultural creative design, promoting the inheritance of Chinese cultural and artistic heritage and the development of intangible cultural heritage, arousing the public's emotional resonance, strengthening the dissemination of local culture, and enhancing the public's sense of national pride.

## 5.2 DISCUSSIONS

### 5.2.1 RESEARCH STATEMENT

The decorative patterns of bronze mirrors in the Song, Liao and Jin Dynasties adopted a mixed research method, combining literature analysis, field observation, questionnaire survey, comparative research, expert consultation and design practice. Three goals and three hypotheses were established.

The first goal is to study the cultural connotation and artistic value of the decorative patterns of bronze mirrors in Datong City, Shanxi Province, China during the Song, Liao and Jin Dynasties, analyze its artistic aesthetic characteristics, and

conduct in-depth research on the composition, appearance, lines and categories of representative bronze mirrors.

The second goal is to combine the image analysis method to analyze the integration of folk culture and foreign culture in bronze mirrors, and study the decorative meaning and unique charm of bronze mirrors in the Song, Liao and Jin Dynasties.

The third goal is to extract the basic shape of the pattern, assist graphic thinking, and use shape grammar to substitute graphic design for innovative patterns with modern aesthetic forms.

H1: The decorative patterns of bronze mirrors in Datong area during the Song, Liao and Jin Dynasties have systematic artistic characteristics in composition, line expression and category division, and reflect strong regionality and timeliness in cultural connotation. Its aesthetic value and composition logic can provide a reference for the form and content of contemporary pattern design.

H2: As a precious resource of artistic and cultural heritage, the folk cultural symbols and artistic expressions contained in the decorative patterns of bronze mirrors during the Song, Liao and Jin dynasties have important cultural heritage value. Through in-depth analysis and design practice of its decorative images, combined with the intangible cultural heritage skills of bronze carving, it is possible to not only explore the traditional cultural connotations behind it, but also provide new paths and design practices for the modern dissemination and protection of intangible cultural heritage.

H3: Through the extraction and design innovation of the basic forms of bronze mirror decorative patterns through shape grammar design theory, the logical and systematic innovative design expression of traditional patterns can be realized, and modern aesthetic characteristics can be given to them on the basis of maintaining their traditional cultural roots, thereby providing feasible design methods and paths for the contemporary expression of traditional decorative patterns.

The design practice of this study was carried out in a workshop and divided into three groups. The purpose of the art design workshop is to stimulate creativity and conduct modern aesthetic design innovation practices by exploring the representative decorative patterns of bronze mirrors unearthed in Datong during the Song, Liao and Jin Dynasties. During the activity, the group members communicated and collaborated with each other, and the participants shared their ideas and carried out design discussions and collaborations in their professional fields. The workshop group members cultivated teamwork spirit and critical thinking through collective creation activities.

In the expert interview, five industry experts were interviewed in depth, namely Gao Yuhong, Dean of the School of Art and Design of Shanxi University of Communication and Professor of Design; Cao Yu, Vice Dean of the School of Art and Design of Shanxi University of Communication and Associate Professor of Design; Shi Tong, Professor of Visual Communication Design of the School of Art and Design

of Shanxi University of Communication; Gao Peng, Associate Professor of Visual Communication Design of the School of Art and Design of Shanxi University of Communication and Design, Design Director of Shanxi Juexi Cultural Communication Co., Ltd.; Li Anmin, inheritor of the national intangible cultural heritage Datong bronze ware making skills.

During the interview, Dean Gao Yuhong proposed in the interview: the structural layout of the patterns, the selection of diversified types, the selection of clarity and representativeness should be paid attention to in the innovative design of the decorative patterns of the Song, Liao and Jin bronze mirrors.

During the interview, Professor Cao Yu made specific suggestions on the application of shape grammar methods: in terms of element extraction, the core graphic rules in the bronze mirror pattern are extracted through parametric design. In terms of design reorganization, shape grammar is used to recombine pattern elements to create a new formal language.

During the interview, Li Anmin, the inheritor of the national intangible cultural heritage Datong bronze ware making skills, emphasized that the breakthrough in bronze mirror casting technology is the basis for pattern innovation. The combination of modern technology can make the pattern more three-dimensional and exquisite.

During the interview, Professor Shi Tong believed that the following principles should be paid attention to in inheritance and innovation: 1) Respect history: avoid excessive commercialization and weakening the cultural connotation of the original pattern. 2) Sustainable development: emphasize the timeliness of the pattern in design. Combined with modern design language, by simplifying lines, recombine pattern elements and combine modern materials, give traditional patterns new vitality. 3) Multidisciplinary integration: combine traditional intangible cultural heritage techniques and culture while thinking about modern technology and exploring the innovative possibilities of patterns.

During the interview, design director Associate Professor Gao Peng believed that these historical patterns have been presented in the fields of cultural creativity and home design. We should avoid worthless reproduction, respect the patterns of the bronze mirror as a work of art, and do a good job in pattern design.

Through in-depth interviews with experts, a consistent view can be drawn: the decorative patterns of bronze mirrors in the Song, Liao and Jin dynasties not only reflect the aesthetic trends and craftsmanship in a specific historical context, but also carry rich cultural implications and aesthetic meanings, and have high research value and artistic appreciation value. Experts generally believe that this study is based on the innovative design practice of bronze mirror patterns in this period. On the basis of respecting the traditional cultural context, it integrates modern design language and design methodology, and effectively promotes the contemporary expression and visual extension of traditional patterns. The research results not only provide a practical path for the revitalization and redesign of bronze mirror decorative patterns, but also provide theoretical support and design practice experience for the diversified

development and cultural research of decorative patterns in the future, reflecting the regeneration potential and inheritance value of traditional culture in the contemporary design system.

### 5.2.2 DISCUSSION AND SUMMARY OF THE RESEARCH PROCESS

This research process uses a mixed research method to collect quantitative and qualitative research data, and the research is divided into five stages.

The first stage is qualitative research, which explores and demonstrates through literature analysis, field investigation records, group discussions, in-depth interviews, etc.

The second stage is quantitative research, which collects a large amount of research data on the design of bronze mirror decorative patterns in the Song, Liao and Jin dynasties through questionnaire surveys, analyzes the data and calculates the data results, and uses them for the next stage of problem research.

The third stage is design research, which aims to study how to combine design theory, analyze the design composition rules and generation and transformation process of bronze mirror decorative patterns, and innovate decorative pattern design results.

The fourth stage is design practice, which applies the research results of the first three stages to design practice. The results of design research are further integrated with the intangible cultural heritage bronze carving craftsmanship, and implemented as physical art works of carving, reflecting the activation and inheritance of traditional skills. The generation of patterns no longer relies on subjective experience, but realizes logical rules through the design theory of shape grammar, which effectively improves the scientific and creativity of design.

The fifth stage is exhibition activities. Researchers have constructed a three-dimensional exhibition communication system through various media means such as design manuals, posters, and information visualization panels. Scanning the QR code on your mobile phone can watch the video design of the carving process, which enables the traditional craft to be visualized and interactively experienced, and enhances the perceptibility and recognition of intangible cultural heritage. Secondly, the researchers further verified the acceptance effect and cultural communication value of the design results at the public level by conducting interactive experience activities of rubbing, combined with the results of satisfaction survey analysis.

Based on the summary of the research process of the above five stages, this study not only shows the complete design process from theoretical research to design practice and exhibition activities, but also reflects the re-creation of traditional Chinese decorative pattern art in the contemporary context, effectively achieving the dual goals of inheritance and innovation, and providing a theoretical framework and design practice path for future related design research.

## 5.3 COMPLEX ISSUES ENCOUNTERED IN RESEARCH

### 5.3.1 INTERDISCIPLINARY LEARNING STAGE

In the learning stage of knowledge accumulation, the research on the innovative design of decorative patterns of Song, Liao and Jin bronze mirrors is a comprehensive design exploration that integrates multiple disciplines and fields such as history, art design, arts and crafts, and intangible cultural heritage. Learners need to have a deep understanding of the historical development of ancient Chinese bronze mirrors, especially the historical background, cultural connotation and pattern characteristics of bronze mirrors in the Song, Liao and Jin dynasties. At the same time, they need to understand the principles of graphic design, the concept of intangible cultural heritage protection, and modern design methodology and carving techniques. In addition, learners should also have a high level of artistic aesthetic literacy and cultural sensitivity, and be able to establish a visual and conceptual connection between tradition and modernity.

Knowledge disseminators need to have both traditional cultural literacy and contemporary design expression capabilities. They must not only have a deep understanding of the composition rules and formal beauty of the decorative patterns of Song, Liao and Jin bronze mirrors, but also master the shape grammar design theory, image digital processing methods, and technical processes of intangible cultural heritage crafts (such as bronze carving, rubbing, etc.). They need to have the ability to transform traditional cultural content into innovative design language, and be able to transform complex theoretical knowledge into visual design results that are acceptable to audiences at different levels, so as to promote the integrated development of cultural inheritance and innovation.

Learners must also have a solid foundation in decorative art design and have a strong interest in traditional Chinese patterns. Through continuous theoretical learning and design practice, they can improve their professional ability and design innovation level, and help innovate and inherit Chinese decorative pattern art in the context of the new era.

### 5.3.2 DESIGN AND PRACTICE PHASE

In the design and practice stage, how to systematically formulate the rules of shape grammar and summarize them into a unified design formula is one of the key challenges faced in the research. Especially in the process of innovation of basic patterns, it is necessary to extract representative elements from traditional patterns, and use shape grammar theory as a guide to carry out analysis and reconstruction of composition logic. This not only requires the design results to achieve modern translation in visual form, but also to convey the cultural implications contained in

traditional patterns. To achieve this goal, solid design theory support, keen aesthetic judgment, and deep practical operation ability are required.

In the practice stage of bronze mirror carving, the complexity of carving technology puts higher requirements on the transformation of research results. Carving is a traditional skill with high precision and high artistry. It is extremely difficult to operate. The full participation of intangible cultural heritage inheritors has become the key to ensuring the fineness and artistic level of the work. The researchers worked closely with many inheritors of carving technology to repeatedly polish every detail to ensure the integrity and expressiveness of the design plan in the transformation process, thereby promoting the transformation of theoretical research results into high-level artwork creation.

On this basis, this study explored innovative patterns suitable for modern visual aesthetics through repeated modification and optimization of multiple rounds of pattern design. With ten years of design experience and drawing software teaching background, the researcher is able to skillfully use professional software for refined expression and solve the technical bottleneck of shape grammar in the digital presentation process. The final design results received high evaluation in the audience survey, indicating that the research has achieved positive results between the inheritance of traditional cultural arts and modern aesthetic needs.

### 5.3.3 EXHIBITION ACTIVITY IMPLEMENTATION STAGE

During the implementation of the exhibition, the research team faced complex issues such as venue coordination, content planning, and audience feedback collection. This study was successfully held in Datong Art Museum, the most representative exhibition institution in Datong City, Shanxi Province, which is the largest and most concentrated art exhibition space in the local area. The early application and preparation process went through strict review and multiple rounds of waiting to ensure that the exhibition content was highly consistent with the theme of intangible cultural heritage. The exhibition activities were carried out simultaneously in the static display space of the intangible cultural heritage exhibition area and the interactive communication exhibition area of the art museum, aiming to collect audience feedback from different levels and improve the comprehensiveness and accuracy of the data. The challenge of this stage lies not only in the high difficulty of organization and coordination, but also in how to design the display content to attract audiences from different backgrounds and effectively obtain their satisfaction evaluation.

After the exhibition, the rubbing experience activity of the innovative patterns of bronze mirrors was carried out, which further deepened the public's understanding of the cultural background and sense of participation. The activity was held in the rubbing studio, where participants experienced the rubbing process in person and gained a deep understanding of the cultural connotation of the bronze mirror patterns

and the artistry of the patterns of this research result. Since the rubbing technique itself is difficult to operate, the experience link emphasizes perception and communication rather than skill mastery. In this process, researchers collected first-hand feedback information through face-to-face communication with participants, enriched the dimensions of research data, and provided valuable reference for future design and cultural communication strategies. This activity not only effectively promoted the dissemination of research results, but also explored a new path of cultural inheritance that integrates interactive experience and academic research.

#### 5.4 ANALYSIS OF RESEARCH RESULTS

As an important topic integrating traditional Chinese culture and modern design thinking, the innovative design of decorative patterns on bronze mirrors during the Song, Liao and Jin Dynasties has been systematically and deeply explored around three main goals in this study. First, the researchers focused on the representative bronze mirrors of the Song, Liao and Jin Dynasties unearthed in Datong City, Shanxi Province, China, and analyzed their composition forms, appearance characteristics, line structures and decorative categories from the perspective of cultural connotation and artistic value. By combing and summarizing the artistic aesthetic characteristics and pattern element information of the decorative patterns of bronze mirrors, the era style and cultural implications behind them are revealed, providing a solid theoretical support for the understanding and inheritance of traditional bronze mirror art.

Secondly, the study combined image analysis to analyze the integration relationship between folk cultural elements and foreign cultural factors in bronze mirrors. Through the comparison and classification of images and the results of expert interviews, the cultural symbolic meaning and unique visual charm of the bronze mirror decorations during the Song, Liao and Jin Dynasties were further excavated, and representative bronze mirror decorative patterns were selected as the design source of this study. The results of this stage provide a clear cultural source and background for the subsequent innovative design of decorative patterns.

On this basis, the study further extracts the basic shapes of typical patterns in representative bronze mirrors, and uses shape grammar theory to reconstruct and redesign Chinese traditional pattern elements. Through the formulation of shape rules and parametric operations, the modern visual expression path of patterns is explored, and finally a set of innovative bronze mirror pattern design solutions with contemporary expression and cultural depth are formed. This study generates new design logic from traditional images, integrating theoretical analysis, cultural interpretation and image innovation, which not only provides new ideas for the contemporary expression of bronze mirror patterns, but also provides a useful reference for the transformation and inheritance of Chinese traditional cultural arts in the context of modern design.

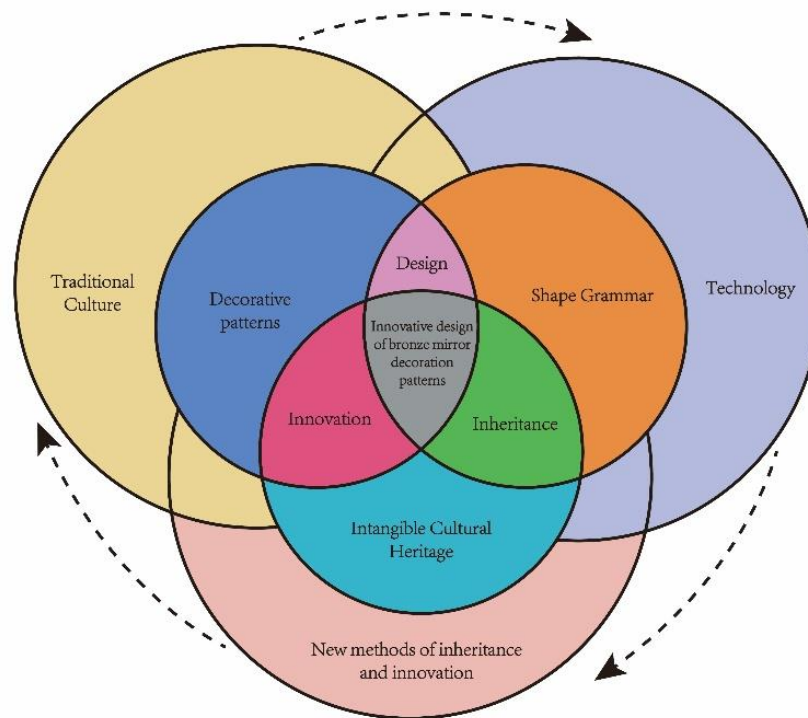


Figure 96 *Theoretical framework of the research findings*  
 Note. Researchers draw their own, 2025

Through systematic sorting and in-depth analysis of the decorative patterns of bronze mirrors during the Song, Liao and Jin dynasties, this study explores an innovative design and inheritance path that combines shape grammar, decorative patterns, and intangible cultural heritage on the basis of inheriting traditional patterns. By constructing the graphic composition logic and visual rules of bronze mirror patterns, the researchers used shape grammar as a design theory to structurally deconstruct and modernize traditional patterns, while maintaining cultural connotations and historical styles, and realized the contemporary expression of pattern design language. This method not only expands the thinking path of transforming traditional images into modern designs, but also provides theoretical and design practice support for the digitalization and modernization of intangible cultural heritage bronze carving techniques.

In design practice and exhibition activity planning, the study integrates the intangible cultural elements of bronze mirror carving and chiseling techniques and rubbing art, emphasizing the technical accuracy and professional artistic expression in the process of pattern design from image to physical object, and promoting the deep integration of traditional culture and modern technology. In the exhibition session, the design results were jointly exhibited in Datong Art Museum and intangible cultural heritage venues, and audience feedback data was collected in combination with

interactive experience activities. The survey results show that most viewers highly recognize the visual presentation and cultural implications of the innovative bronze mirror patterns, reflecting that the design has achieved a relatively ideal balance between artistry, culture and modern aesthetics.

Overall, this study proposes and verifies an innovative method that takes shape grammar as the core of design theory and integrates Chinese intangible cultural heritage, providing a practical strategy for the redesign of the decorative patterns of Song, Liao and Jin bronze mirrors. This path not only responds to the needs of cultural inheritance, but also provides a model and design case with theoretical value for the transformation of intangible cultural heritage in contemporary design practice.

## **5.5 RESEARCH LIMITATIONS AND FUTURE RECOMMENDATIONS**

### **5.5.1 RESEARCH LIMITATIONS**

The limitations of this study are mainly reflected in the aspects of technical implementation, process processing and social and cultural factors.

As an intangible cultural heritage, bronze mirror carving and chiseling has a very high technical threshold and has strict requirements on the proficiency of manual skills and experience accumulation. Its operation process is complicated, especially in the mold making process, which requires a long time to carve and debug. For molds with special shapes, the production cycle is long and the cost is high, which makes it difficult to promote them in batches in a short period of time.

As an intangible cultural heritage, rubbing art is one of the ways to display and spread this study, and it has a high technical threshold. Due to the complex process and fine technical requirements, ordinary participants are more focused on experience and feelings, and it is difficult to reach professional standards or present high-quality rubbing works in practice. This skill requires long-term practice and precipitation to achieve ideal results in terms of operational stability and artistic expression.

At the social and cultural level, the symbolic meaning and cultural background carried by the patterns of traditional Chinese bronze mirrors have a certain understanding threshold for audiences with lower education. Although it has been alleviated through exhibitions and experience activities, more paths still need to be explored in future research.

### **5.5.2 RECOMMENDATIONS FOR FUTURE RESEARCH**

#### **1) Deepen the research on the integration of technology and craftsmanship**

In the future, it is recommended to further explore the synergy mechanism between decorative patterns and production processes, and improve the process from digital design to physical production. It is recommended to introduce modern manufacturing technologies such as 3D modeling, parametric construction, and laser

engraving to enhance the reproducibility and artistic expression of traditional patterns in the modern context, and promote the deep integration of intangible cultural heritage craftsmanship and digital technology.

2) Optimize the public participation mechanism and inheritance model

In view of the high threshold of operation of skills such as rubbing and carving, future research should focus on popular experience and education popularization, develop standardized teaching methods, simplify process flow, establish an online and offline combined participation and dissemination platform, enhance the public affinity and dissemination breadth of intangible cultural heritage, and explore sustainable modern inheritance mechanisms.

3) Carry out long-term data survey and evaluation system construction

It is recommended to establish a systematic audience feedback and social acceptance data collection mechanism, and carry out long-term follow-up surveys and evaluation research.

4) Promote the transformation path of digital design

In the future, we should focus on the process path research of the transformation of design results into physical products. Including material adaptation, structure realization, production process optimization and other links, so as to achieve the wide implementation of digital design results.

5) Application prospects of bronze mirror patterns in cultural and creative design

In view of the analysis of the application status of bronze mirror patterns in the field of modern art design in Chapter 2, future research can further expand the development and practice of bronze mirror patterns in cultural and creative product design. It is recommended to explore diversified cultural and creative design carriers by combining contemporary aesthetic trends with user needs.

6) Future new materials integrate sustainable design concepts

It is recommended that future research should focus on modern people's preference for materials and actual use experience. In traditional bronze mirrors, bronze as the main material has a sense of heaviness and solemnity, while modern art design often uses brass or alternative materials with better processability. In the future, the feasibility and expressiveness of new metals, composite materials or environmentally friendly materials in the innovative design of bronze mirror patterns can be further explored, which will not only help improve the aesthetics and practicality of the product, but also conform to the current development trend of sustainable design.

## 5.6 CHAPTER SUMMARY

Starting from the three levels of conclusion, discussion and future suggestions, this chapter systematically summarizes the main achievements, complex problems and research limitations in the process of innovative design of bronze mirror

decorative patterns in the Song, Liao and Jin Dynasties, and proposes feasible paths for future research.

This study achieved three core goals. First, from the dimension of cultural and artistic value, the representative bronze mirrors of the Song, Liao and Jin Dynasties unearthed in Datong City, Shanxi Province were deeply analyzed, and their composition forms, external contours, line characteristics and decorative categories were explored, revealing the comprehensive artistic characteristics of bronze mirror patterns in aesthetics, symbolism and function. Secondly, the integration of local folk culture and foreign cultural factors reflected in bronze mirrors was studied, and the rich cultural implications and unique charm of image language behind the patterns were explored. Thirdly, the researchers extracted the basic shape elements in the bronze mirror patterns, and with the help of graphic thinking, semiotics theory and shape grammar design theory, the patterns were structurally reorganized and modern aesthetically reconstructed, exploring a set of innovative design patterns of bronze mirror patterns that combine traditional cultural spirit and modern visual language.

During the research process, the research team faced and overcame many complex challenges, especially in the technical level of combining traditional craftsmanship with modern design. Key links such as carving and chiseling techniques, rubbing operations, and mold making all have high technical barriers and implementation difficulties, such as long material processing cycles and scarcity of intangible cultural heritage inheritors.

Nevertheless, this study not only proposed a new path for the innovation of shape grammar design theory and decorative patterns, and the integration and inheritance of intangible cultural heritage and innovative pattern design results at the academic level, but also collected audience satisfaction data through exhibitions, experiences and public interactions at the practical level, verifying the spread ability and public recognition of the design. Future research can further strengthen the integration with digital design and build a long-term data evaluation system to provide a more systematic and sustainable development path for the contemporary expression of Chinese traditional pattern art and the innovative inheritance of intangible cultural heritage.

## APPENDIX



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Date : February 29, 2024

### Acceptance Letter

**Dear Author (S) : Dang Linjing and Yodkwan Sawatdee**

**Paper ID : 670625**

**PaperTitle : The Analysis on the Characteristics of Decorative Patterns of Bronze Mirrors in the Song, Liao and Jin Dynasties in China**

This is to enlighten you that above manuscript reviewed and appraised by the review committee member of Journal of Roi Kaensarn Academi by 3 assessors and it is accepted for the purpose of publication in Journal of Roi Kaensarn Academi at Group 1 of Thai journal citation Index Centre (TCI) with ISSN 2697-5033 (Online) Volume 9 Issue 6 June 2024 that will be available at <https://so02.tci-thaijo.org/index.php/JRKSA/index>

**Sincerely**

Dr. Teedanai Kapko

Editor Journal of Roi Kaensarn Academi

No. 0603.02/0484



Office of the Graduate School,  
Naresuan University, Taphao District  
Muang, Phitsanulok 65000

February 13, 2025

**Subject:** Manuscript accepted for publication

Dear Ms. Linjing Dang

The Editorial Board of *Journal of Community Development Research (Humanities and Social Sciences)* is pleased to inform you that your manuscript entitled "**From Social Background to Artistic Expression: The Design and Cultural Value of Decorative Patterns on Bronze Mirrors During the Song, Liao, and Jin Dynasties in China**" is accepted for publication. The manuscript will be published in Volume 18 No. 1 (January - March 2025).

Thank you for your contribution to *Journal of Community Development Research (Humanities and Social Sciences)*.

Sincerely yours,



(Associate Professor Dr. Watana Padgate)  
Editor-in-Chief

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No. IJSASR. 100

Date: 30 March 2025

Acceptance Letter

Dear: **Linjing Dang and Yodkwan Sawatdee**

Paper Title: **Revitalizing Chinese Bronze Mirror Patterns: Educational Integration and Traditional Skill Innovation**

This is to enlighten you that the above manuscript submitted for publishing in International Journal of Sociologies and Anthropologies Science Reviews [IJSASR], Old ISSN 2774-0366 (Online); New ISSN 2985-2730 (Online), indexed by **Thai Journal Citation Index Centre (TCI) Tier 1, DOI CrossRef Member, ResearchGate, and SEMANTIC SCHOLAR**. The editorial team would like to inform you that your article has been reviewed by peer reviewers, experts in the field of the article, come from various external institutions and are not affiliated with the same organization as the author. It is acceptable for publication in the IJSASR, which will be available in Volume 5 Issue 5 (September-October 2025) at <https://so07.tci-thaijo.org/index.php/IJSASR/about>

Sincerely

Asst. Prof. Dr. Sanya Kenaphoom  
 Editor-In-Chief



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No. 0223

Faculty of Decorative Arts, Sripatom University  
No. 114, Lam Sai, Hua Lamong, Maha Vithayalai  
Pura, Bangkok, Bangkok 10200 Thailand

13 January 2025

Subject: Request for information and an interview

Dear Associate Professor Gao Yu

Miss Liying DANG, Student ID: 65543052, a doctoral student major in Design at the Faculty of Decorative Arts, Sripatom University, who is currently working on the dissertation titled "Innovative Design and Inheritance of Decorative Patterns on Bronze Mirrors During the Song, Liao and Jin Dynasties", would like to request some information and an interview with in order to collect data as a part of her dissertation research.

On behalf of the Faculty of Decorative Arts, Sripatom University, we kindly request your cooperation and assistance in providing information and participating in an interview. For additional details, please contact Miss Liying DANG at telephone number 095-274-9833, who will serve as a direct coordinator.

Yours faithfully,

Assoc. Prof. Awan Inrangsi  
Dean of Faculty of Decorative Arts,  
Sripatom University

Contact to: [info@decora.ac.th](mailto:info@decora.ac.th)  
Tel: +662-221-5874, +662-221-5832



No. 0225

Faculty of Decorative Arts, Sripatom University  
No. 114, Lam Sai, Hua Lamong, Maha Vithayalai  
Pura, Bangkok, Bangkok 10200 Thailand

13 January 2025

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No. 0226

Faculty of Decorative Arts, Sripatom University  
No. 114, Lam Sai, Hua Lamong, Maha Vithayalai  
Pura, Bangkok, Bangkok 10200 Thailand

13 January 2025

Subject: Request for information and an interview

Dear Mr. Li Aunze

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No. 0221

Faculty of Decorative Arts, Sripatom University  
No. 114, Lam Sai, Hua Lamong, Maha Vithayalai  
Pura, Bangkok, Bangkok 10200 Thailand

13 January 2025

Subject: Request for information and an interview

Dear Professor Li Rui

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## 宋辽金时期铜镜装饰纹样认知度调查问卷

### AWARENESS OF DECORATIVE PATTERNS ON BRONZE MIRRORS FROM THE SONG, LIAO, AND JIN DYNASTIES: A QUESTIONNAIRE

尊敬的受访者：

感谢您参与这项关于宋、辽、金时期铜镜装饰纹样的认知度调查。本问卷旨在了解公众对这一特定历史时期铜镜装饰纹样的认知情况及相关兴趣。您的回答将用于学术研究，所有数据将严格保密，确保您的隐私不受侵犯。

Dear Respondent,

Thank you for participating in this survey on the awareness of decorative patterns on bronze mirrors from the Song, Liao, and Jin dynasties. This questionnaire aims to explore public knowledge and interest regarding the decorative motifs of bronze mirrors from these specific historical periods. Your responses will be used for academic research, and all data will be kept confidential to protect your privacy.

---

#### 基本信息 / Basic Information

1. 您的性别是？

What is your gender?

- A. 男 / Male
- B. 女 / Female
- C. 其他 / Other
- D. 不愿透露 / Prefer not to say

2. 您的年龄是？

What is your age?

- A. 18 岁以下 / Under 18
- B. 18-25 岁 / 18-25
- C. 26-35 岁 / 26-35
- D. 36-45 岁 / 36-45
- E. 46 岁以上 / Above 46

3. 您的学历是？

What is your highest level of education?

- A. 高中及以下 / High school or below
- B. 大专 / Associate degree
- C. 本科 / Bachelor's degree
- D. 硕士及以上 / Master's degree or higher

---

#### 认知度问题 / Awareness Questions

4. 您对宋、辽、金三个朝代中哪一个朝代的铜镜了解程度更高？

Which dynasty's bronze mirrors do you know better about: Song, Liao, or Jin?

- A. 宋代 / Song
- B. 辽代 / Liao

- C. 金代 / Jin

5. 您更偏好宋、辽、金三个朝代中哪一个朝代铜镜的装饰纹样?

Which dynasty do you prefer for bronze mirrors: Song, Liao, or Jin??

- A. 宋代 / Song
- B. 辽代 / Liao
- C. 金代 / Jin

6. 您对于以下几种铜镜装饰纹样哪个更加熟悉?

Which of the following bronze mirror decorative patterns are you more familiar with?

- A. 动物纹 / Animal pattern
- B. 花鸟纹 / Flower and bird pattern
- C. 人物故事纹 / Character story pattern

#### 兴趣与来源 / Interests and Sources

7. 您是否愿意进一步了解宋、辽、金时期的铜镜及其装饰艺术?

Would you like to learn more about the bronze mirrors and their decorative art from the Song, Liao, and Jin dynasties?

- A. 愿意 / Yes
- B. 不愿意 / No

8. 您是通过何种方式认识宋、辽、金时期铜镜装饰纹样的? (多选)

How did you learn about the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties? (Multiple choices allowed)

- A. 博物馆展览 / Museum exhibitions
- B. 网络 / Network
- C. 书籍和期刊 / Books and journals
- D. 艺术活动 / Art Activities

#### 开放性问题 / Open-Ended Questions

9. 您认为宋、辽、金时期铜镜装饰纹样最具代表性的特点是什么?

In your opinion, what are the most representative features of decorative patterns on bronze mirrors from the Song, Liao, and Jin dynasties?

(请简要回答 / Please briefly answer): \_\_\_\_\_

10. 您未来的铜镜装饰纹样的设计研究或文化艺术推广和传承有何建议?

What suggestions do you have for future design research on bronze mirror decorative patterns or promotion and inheritance of cultural arts?

(请简要回答 / Please briefly answer): \_\_\_\_\_

感谢您的参与!

Thank you for your participation!

## 宋辽金时期铜镜装饰纹样现有艺术品的满意度调查问卷

### SATISFACTION SURVEY QUESTIONNAIRE ON EXISTING ARTWORKS OF BRONZE MIRROR DECORATION PATTERNS DURING THE SONG, LIAO AND JIN DYNASTIES

尊敬的受访者：

感谢您参与这项关于宋、辽、金时期铜镜装饰纹样现有艺术品的满意度调查。本问卷旨在了解公众对这一特定历史时期装饰纹样在现有艺术品设计中的真实感受及期望。您的回答将为进一步的设计和 research 提供重要参考，所有数据将严格保密。

Dear Respondent,

Thank you for participating in this survey on the satisfaction of existing artworks with decorative patterns on bronze mirrors from the Song, Liao, and Jin dynasties. This questionnaire aims to understand the public's true feelings and expectations about the decorative patterns of this particular historical period in existing artwork designs. Your answers will provide important references for further design and research, and all data will be kept strictly confidential.

---

#### 基本信息 / Basic Information

1. 您的性别是？

What is your gender?

- A. 男 / Male
- B. 女 / Female
- C. 其他 / Other
- D. 不愿透露 / Prefer not to say

2. 您的年龄是？

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- A. 18 岁以下 / Under 18
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- C. 26-35 岁 / 26-35
- D. 36-45 岁 / 36-45
- E. 46 岁以上 / Above 46

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What is your highest level of education?

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- C. 本科 / Bachelor's degree
- D. 硕士及以上 / Master's degree or higher

---

#### 使用习惯 / Usage Habits

4. 您平时会购买艺术品吗？

Do you usually buy art?

- A. 经常 / Frequently

- B. 偶尔 / Occasionally
  - C. 很少 / Rarely
  - D. 从不 / Never
5. 您通常通过哪些途径购买? (多选)
- How do you usually purchase? (Multiple choices allowed)
- A. 博物馆商店 / Museum shops
  - B. 在线平台 / Online platforms
  - C. 旅游景点 / Tourist attractions
  - D. 其他 (请说明) / Other (Please specify): \_\_\_\_\_

### 设计满意度 / Satisfaction with Design

6. 您是否了解宋、辽、金时期铜镜的装饰纹样?
- Are you familiar with the decorative patterns on bronze mirrors from the Song, Liao, and Jin dynasties?
- A. 非常了解 / Very familiar
  - B. 有一些了解 / Somewhat familiar
  - C. 了解很少 / Know very little
  - D. 完全不了解 / Not familiar at all
7. 您是否见过或拥有有关宋、辽、金时期铜镜装饰纹样设计的艺术作品?
- Have you seen or owned any artwork related to the decorative pattern designs of bronze mirrors from the Song, Liao, and Jin dynasties?
- A. 见过并拥有 / Have seen and owned
  - B. 见过但未拥有 / Have seen but not owned
  - C. 没见过 / Have not seen
8. 您对现有的宋、辽、金时期铜镜装饰纹样相关设计品满意吗?
- Are you satisfied with the existing designs of bronze mirrors with decorative patterns from the Song, Liao and Jin dynasties?
- A. 非常满意 / Very satisfied
  - B. 比较满意 / Satisfied
  - C. 一般 / Neutral
  - D. 不满意 / Dissatisfied

### 设计需求度 / Design Demand

9. 您对于铜镜装饰纹样创新设计的需求程度是什么?
- What is your demand for innovative designs of bronze mirror decoration patterns?
- A. 非常需要 / Very Necessary
  - B. 需要 / Necessary
  - C. 无所谓 / Indifferent
  - D. 不需要 / Unnecessary
10. 您希望未来创新的铜镜装饰纹样艺术品在设计上如何改进?
- How do you hope to improve the design of innovative bronze mirror decorative pattern artworks in the future?

- A. 完全现代化设计 / Completely Modern Design
- B. 保持传统风格 / Keep it Traditional
- C. 传统元素融合现代设计 / Traditional elements combined with modern design

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### 总体评价 / Overall Evaluation

11. 您认为宋、辽、金时期铜镜装饰纹样对中国传统文化的传承与发展有何意义?

What do you think is the significance of the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties to the inheritance and development of Chinese traditional culture?

(请简要回答 / Please briefly answer): \_\_\_\_\_

12. 您认为大同市本地对于宋、辽、金时期铜镜装饰纹样的文化推广和传承活动方面还有哪些提升空间或建议?

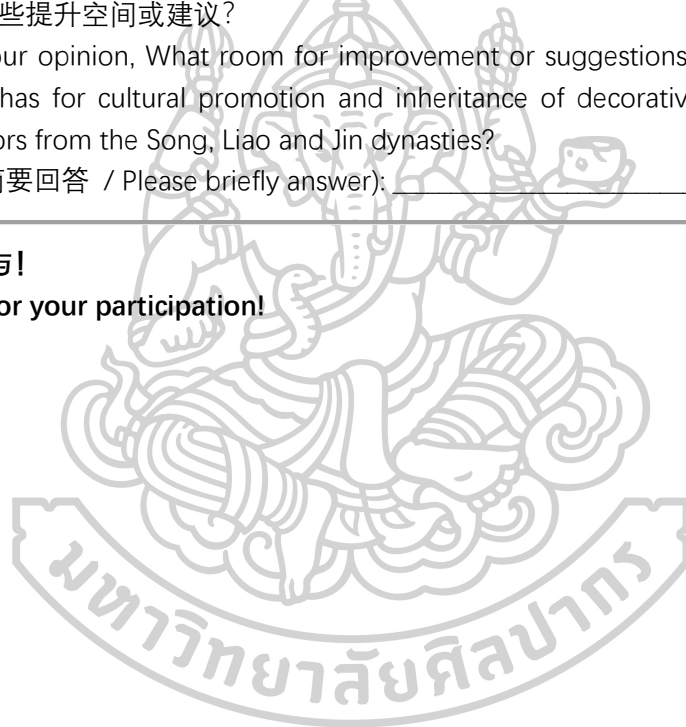
In your opinion, What room for improvement or suggestions do you think Datong City has for cultural promotion and inheritance of decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties?

(请简要回答 / Please briefly answer): \_\_\_\_\_

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感谢您的参与!

Thank you for your participation!



## 宋辽金时期铜镜装饰纹样创新性设计的专家问卷

### EXPERT QUESTIONNAIRE ON INNOVATIVE DESIGN OF DECORATIVE PATTERNS ON BRONZE MIRRORS DURING THE SONG, LIAO AND JIN DYNASTIES

尊敬的专家：

感谢您参与本次关于宋、辽、金时期铜镜装饰纹样创新性设计的问卷调查。您的宝贵意见将为本研究提供重要指导。请根据您的专业经验和见解，回答以下开放性问题。

Dear experts:

Thank you for participating in this questionnaire survey on the innovative design of decorative patterns on bronze mirrors during the Song, Liao and Jin dynasties. Your valuable opinions will provide important guidance for this study. Please answer the following open questions based on your professional experience and insights.

#### 开放性问题 / Open-Ended Questions

1. 您认为宋、辽、金时期的铜镜装饰纹样有哪些独特的文化价值和艺术价值？

In your opinion, what unique cultural and artistic values do you think the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties have?

(请简要回答 / Please briefly answer): \_\_\_\_\_

2. 在现代设计领域中，您认为这些装饰纹样可以如何应用？

How do you think these decorative patterns can be applied in the field of modern design?

(请简要回答 / Please briefly answer): \_\_\_\_\_

3. 在创新性设计中，您认为如何有效平衡宋、辽、金时期铜镜装饰纹样的文化传承与现代创新？

In innovative design, how do you think we can effectively balance the cultural heritage and modern innovation of the decorative patterns on bronze mirrors from the Song, Liao and Jin dynasties?

(请简要回答 / Please briefly answer): \_\_\_\_\_

4. 您认为在大同市出土的宋辽金时期铜镜装饰纹样中，如何选择出具有代表性的铜镜纹样？

How do you choose representative bronze mirror patterns from the decorative patterns of bronze mirrors from the Song, Liao and Jin dynasties unearthed in Datong City?

(请简要回答 / Please briefly answer): \_\_\_\_\_

5. 在设计实践中，您认为铜镜装饰纹样的图形设计需要哪些改进才能更好地融入现代审美？

In design practice, what improvements do you think are needed for decorative

patterns on bronze mirrors to better fit modern aesthetics?

(请简要回答 / Please briefly answer): \_\_\_\_\_

6. 您对于宋、辽、金时期铜镜装饰纹样艺术品的制作工艺上有何建议?

What suggestions do you have for the production process of decorative pattern artworks on bronze mirrors from the Song, Liao and Jin dynasties?

(请简要回答 / Please briefly answer): \_\_\_\_\_

7. 对于结合形状文法的设计方法来创新铜镜装饰纹样，您有什么建议或策略?

What suggestions or strategies do you have for innovating bronze mirror decorative patterns by combining shape grammar design methods?

(请简要回答 / Please briefly answer): \_\_\_\_\_

8. 您认为未来研究宋、辽、金时期铜镜装饰纹样图形设计的重点方向是什么? 有何建议?

In your opinion, what do you think is the key direction for future research on the decorative pattern design of bronze mirrors during the Song, Liao and Jin dynasties? Do you have any suggestions?

(请简要回答 / Please briefly answer): \_\_\_\_\_

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感谢您的宝贵时间和意见! 您的反馈将对研究产生重要影响。

Thank you for your valuable time and insights! Your feedback will have a significant impact on the research.



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