



**THE RESEARCH OF CHINESE TRADITIONAL COLORS TO
DEVELOPMENT CHINESE TRADITIONAL COLOR SWATCH**



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF FINE ARTS IN DESIGN
COLLEGE OF DESIGN**

**GRADUATE SCHOOL, RANGSIT UNIVERSITY
ACADEMIC YEAR 2024**

Thesis entitled

**THE RESEARCH OF CHINESE TRADITIONAL COLORS TO
DEVELOPMENT CHINESE TRADITIONAL COLOR SWATCH**

by
ZHIYAO ZHOU

was submitted in partial fulfillment of the requirements
for the degree of Master of Fine Arts in Design

Rangsit University
Academic Year 2024

Assoc. Prof. Pisprapai Sarasalin
Examination Committee Chairperson

Prof. Eakachat Joneurairatana, Ph.D.
Member

Assoc. Prof. Paijit Ingsiriwat
Member and Advisor

Approved by Graduate School

(Prof. Suejit Pechprasarn, Ph.D.)
Dean of Graduate School
August 30, 2024

Acknowledgements

Two years of postgraduate life is coming to an end. researcher would like to thank Rangsit University for giving me the opportunity to study here, the leaders of the school and the college for their care and guidance, and my supervisor Dr.Danu Phumalee and Dr.Suthasinee Sangkhum for their support in my research. Thank you for the sincere opinions and suggestions provided by the committee professors (Prof.Dr.Eakachat joneurairatana, Assoc.Prof.Pisprapai Sarasalin, Assoc Prof.Pakorn Prohmvitak, Assoc.Prof.Paiiit ingsiriwat, Asst.Prof.Dr.Sirada Vaiyavatiamai, Asst.Prof.RewatChumnarn, Asst.Prof.Dr.Sammiti Sukbunjhong, Asst.Prof.Jinabhadr Kantaputra, Danu Phoomalee(Ph.D), Sridhar Ryalie, Patipat Chaiwitesh, Chitpaphop Prasertpitoon).

The problems discussed in this paper, researcher hope that the problems raised can cause readers to think and resonate. Due to the limited time, limited accumulation, and limited collecting of books and materials, it is inevitable that there will be omissions in the process of writing, and sincerely hope that readers will forgive.

Once again, I would like to thank my family, Rangsit University, professors and like-minded students. You are the driving force for me to move forward.

Zhiyao Zhou

Researcher

6509030 : Zhiyao Zhou
Thesis Title : The Research of Chinese Traditional Colors to Development
Chinese Traditional Color Swatch
Program : Master of Fine Arts in Design
Thesis Advisor : Assoc. Prof. Paijit Ingsiriwat

Abstract

Since humans entered civilization, there has been a sense of the use of color. In primitive society, people use simple pigments to paint their bodies and decorate walls, or in contemporary society, people use computers to carry out complex color matching designs. These reflect that human beings have never stopped exploring and applying color. Ancient Chinese people studied the color problem in natural phenomena long ago and formed a relatively complete color application system and basic principles. At present, the knowledge of Chinese color is lost and forgotten due to various reasons. For example, the appearance of colors that are easy to use and purchase has led to the disappearance of the wisdom behind traditional Chinese color matching. The names of traditional Chinese colors and the belief in using traditional Chinese colors have also disappeared. Through the study of traditional Chinese colors, this research studies the concept of traditional Chinese colors, understands the stories behind colors and the source of colors by studying traditional Chinese colors from ancient architecture, murals, and paintings, and discovering their names and color sources in historical documents. Subsequently, the researcher combines this knowledge to create a color database, color value set, and provides a color reference for the majority of young designers. This study not only helps understand the development history of Chinese color art, but also has a certain reference value for promoting color aesthetics in excellent traditional Chinese culture and modern design color art.

(Total 54 pages)

Keywords: Chinese Traditional Color, Chinese Color Concept, Chinese Traditional Culture

Student's Signature Thesis Advisor's Signature.....

Table of Contents

	Page
Acknowledgements	i
Abstracts	ii
Table of Contents	iii
List of Figures	v
Chapter 1 Introduction	1
1.1 Background and Significance of the Problem	2
1.2 Research approaches and methods	3
1.3 Research objectives	3
1.4 A review of domestic and foreign research	4
Chapter 2 Literature Review	7
2.1 The Symbolic Significance of Traditional Chinese Colors	7
2.2 Uses of traditional Chinese colors	10
2.3 Traditional Chinese color concepts	13
2.4 The application of traditional Chinese color concepts in modern design colors	19
Chapter 3 Research Methodology	25
3.1 Application of traditional Chinese colors	25
3.2 The origin of traditional Chinese colors and craft materials	30
3.3 Survey on traditional Chinese color cognition	34

Table of Contents (continued)

	Page	
Chapter 4	Design Experience	37
4.1 Design Concept	37	
4.2 Material collection	37	
4.3 Color extraction	40	
4.4 Final design	43	
Chapter 5	Conclusion and Recommendations	45
5.1 Conclusion	45	
5.2 Recommendations	45	
References	46	
Appendix	49	
Biography	54	

มหาวิทยาลัยรังสิต Rangsit University

List of Figures

	Page
Figures	
2.1 Five colors system	12
2.2 Clay sculptures	18
2.3 New Year pictures	19
2.4 Sixiwa LOGO	19
2.5 Phoenix Satellite TV	21
2.6 Facial Makeup	22
3.1 The Northern Wei Dynasty	25
3.2 The Northern Zhou Dynasty	25
3.3 Sui dynasty	26
3.4 Tang Dynasty	27
3.5 Song dynasty	27
3.6 The Palace Museum	28
3.7 Raw material	29
3.8 Mineral raw material	29
3.9 Gardenia and Turmeric	30
3.10 indigo and Cudrania tricuspidata	30
3.11 Cochineal insects	31
3.12 Tyrian purple	32
3.13 Vermilion	33
3.14 Survey	34
3.15 Age and Occupation Division	34
3.16 Cognitive survey	35
4.1 A thousand Li of rivers and mountains	37
4.2 Grotto NO.322 Preaching	37
4.3 Architectural pattern	38
4.4 Plant: Gardenia & Mineral: Lapis lazuli	38
4.5 Orpiment extraction process	39

List of Figures (continued)

	Page
Figures	
4.6 Water washing process	40
4.7 Pigments testing	40
4.8 Photoshop collecting	41
4.9 Photoshop collecting 2	41
4.10 analyze	42
4.11 photography	42
4.12 The Final product	43



Chapter 1

Introduction

1.1 Background and significance of the problem

Since humans entered civilized society, they have developed a consciousness of using colors. Whether in primitive society, people used simple paints to paint their bodies and decorate walls, or in contemporary society, where people use computers to perform complex color matching designs, all these reflect that human beings have never stopped exploring and applying color. A long time ago, ancient Chinese people had already studied the color issues in natural phenomena and formed a relatively complete color application system and basic principles.

Through the research and study of traditional Chinese colors, we can not only fully understand the development history of Chinese color art but also have important guiding significance for modern design. It can be said that a large part of modern color design concepts is influenced by traditional color aesthetics and is extended under the combined effect of a profound historical foundation and the real environment. In the design process, modern designers must not only combine the positive factors in traditional color concepts but also consider the aesthetic trends of modern society and strive to achieve the inheritance and transcendence of traditional color art in modern graphic design. Color research not only includes the study of the traditional color psychology of the Chinese people but also involves specific applications and expansion in various industrial fields. Therefore, in-depth research on traditional Chinese color concepts is of great significance for carrying forward the color aesthetics in China's excellent traditional culture and promoting the development and progress of modern design color art.

1.2 Research approaches and methods

The research methods and approaches employed in this thesis cover multidisciplinary and integrated strategies to achieve the outlined objectives. Here's a breakdown of the methods and approaches:

Historical analysis: This involves examining historical texts, artworks, artifacts, and documents to identify and document the traditional colors used during different historical periods of Chinese culture. By tracing the evolution of color use, this approach can provide insight into the cultural and historical significance of specific colors.

Literature Review: A thorough review of existing literature in Chinese art history, color symbolism, cultural studies, and materials science will be conducted.

Pigment Analysis: Traditional color pigments will be analyzed to search their composition, properties, and origin.

Empirical research: Empirical research methods such as surveys, interviews, and observational studies will be used to collect data on contemporary perceptions and uses of traditional colors in Chinese society.

By combining these research approaches and methods, this thesis aims to provide a comprehensive understanding of traditional Chinese colors and develop practical resources in the form of color swatches to capture the richness and diversity of this cultural heritage.

1.3 Research objectives

This paper takes "Research on Chinese Traditional Colors and Development of Chinese Traditional Color Swatches" as the topic. Its research goals are:

1.3.1 To explore the symbolic meaning, cultural connotation and historical significance of different traditional colors in Chinese culture.

1.3.2 To develop standardized color samples that represent the traditional color scope used in Chinese culture.

1.4 A review of domestic and foreign research

China research results. Liu Zhuo once pointed out: In the development process of human history, each period has a specific social environment background and humanistic thoughts corresponding to it. Therefore, we should learn to study traditional culture from a historical dialectical perspective and analyze the research objects in the corresponding era context. When studying traditional Chinese color concepts, we can summarize some rules related to the use of colors by understanding people's aesthetics and values in different periods. In addition, we can also more accurately grasp the rich ideological connotations contained in the traditional color view by studying the philosophical spirit of the ancients. These abstract ideas constitute the important theoretical basis for modern graphic design concepts. In essence, color design is a kind of culture, and its vitality depends on its own creativity. Therefore, the traditional color view is not fixed, but changes with changes in the social environment. Continuously absorb new elements from it and integrate it with the positive part of itself to form a new color culture, which has become an important application principle for modern designers in color design. It is through continuous accumulation and innovation that traditional color concepts can continue to gain new vitality and continue to progress with the development of human social civilization.

When studying the practical application of "red" in modern design, Zhang Rui proposed that the traditional color concept contains the philosophical spirit and ideological connotation of the ancient Chinese people, reflecting their yearning for a better life. The traditional color concept is part of China's excellent traditional culture. The traditional color concept not only embodies China's national spirit from a visual perspective, but also provides an important theoretical basis for the development and progress of modern Chinese design.

Yuan Jing believes that: On the whole, the color culture concepts at home and abroad are mainly divided into two types: realism and freehand brushwork. The traditional Chinese color concept pays attention to the visual aesthetic effect, and at the same time emphasizes the ideological connotation and psychological effect of the use of color. It has obvious symbolic, decorative and symbolic characteristics, and is a

typical freehand color. In the traditional view of color, almost every color has its own specific ideological connotation and space for use, reflecting the ancient Chinese people's traditional customs and aesthetic awareness of color culture. On the one hand, the sentiment of traditional color culture is restricted by people's lives, but on the other hand, it is close to people's lives and the people's aesthetics and values. On the premise of respecting history and traditional culture, modern designers must pay attention to the visual effects of colors when using traditional color concepts to create, and at the same time, they must also pay attention to the psychological effects that these colors can produce. From a connotation point of view, the traditional color concept is a kind of artistic culture, which mainly emphasizes the internal influence on the individual spirit rather than the external form. Modern designers should accurately grasp this when applying the traditional color concept.

Foreign research results. A long time ago, scholars abroad have begun to study color. Until modern times, science and technology have become increasingly developed, and people's understanding of nature has become clearer and clearer. More and more scholars have begun to invest in the study of light and color, and have obtained many important theoretical and practical results.

The famous British physicist Newton, known as the "Father of Modern Physics", gave people a new understanding of light and color through experiments. Its research results have also become an important part of the theoretical basis of color research. Based on the research on color in the field of physics, many art designers have become more and more mature and bold in their use of color, and a large number of art radicals have emerged. In the 19th century, foreign scholars had conducted detailed research on the semantics of color and published a large number of literature works. These ideas have an important influence on the formation of modern design color concepts. Designers are becoming increasingly sophisticated in their use of color in terms of its semantic output. In addition, various new problems that arise in practical applications have also become an important driving force for people to continue to explore color semantics in depth.

Based on practical investigation results, German scholar Eva Heller made a relatively comprehensive and detailed summary of the various effects and emotional characteristics that different colors can display in typical environments. Japanese professional designer Date Chiyo focused on the principle of color matching when studying the principles of color design, and elaborated on the emotional impression that color can bring to the audience in specific scenes. He also pointed out that color can affect people's inner emotions. In graphic design, different color combinations will bring different psychological effects to viewers.



Chapter 2

Literature Review

2.1 The Symbolic Significance of Traditional Chinese Colors

Color plays a very important role in our lives. From everything in nature to every aspect of our lives, color is inseparable. People's demand for color is profound, and color, as a characteristic of the times, has received more and more attention.

Traditional Chinese colors hold significant cultural and symbolic meanings deeply rooted in Chinese history, philosophy, and aesthetics. These colors are often used in various aspects of Chinese culture, including art, architecture, fashion, and rituals.

The origins of traditional Chinese colors trace back thousands of years, rooted in ancient philosophies, imperial traditions, and natural symbolism. The earliest documented references to color symbolism in Chinese culture can be found in texts such as the "Book of Changes" (I Ching), where colors are associated with elements, seasons, and cosmic forces. During the reign of Emperor Yuan of the Western Han Dynasty (48BC to 33BC), Shi You recorded more than 20 traditional color names in his book, Quichao Chapter: blue, green, soap, purple, red, black, white, Qing, Jiang, Bi, Ti, etc. In the Eastern Han Dynasty, the historical document Shuowen Jiezi, compiled by the Confucian scholar and philologist Xu Shen, recorded 214 words related to color. With the deepening of people's understanding of color, the color system is gradually enriched, the naming of color has also developed from a single word to a word, and the naming method has also expanded from attachment to an object to imitation or to feel the name (Li, 2024). Over millennia, these symbolic associations evolved and merged with various cultural practices, including art, religion, and even governance.

Red stands as the quintessential color in Chinese culture, symbolizing happiness, prosperity, and good fortune. It is prominently featured in weddings, festivals, and other celebratory occasions. The most important color for the Chinese is the red color.

In China, the red color is our country's basic cultural color. It shows the Chinese material and spirit pursuit. It is the color of good luck and is used for decoration and wedding

Dressing, the brides always wear a red Qi Pao or a red wedding dress at wedding ceremony (He, 2009). Gold, representing wealth and prestige, often accompanies red, especially during important ceremonies and festivities.

Yellow holds a special status as the imperial color, Yellow is a royal color. It symbolizes imperality, the power of the throne, and prosperity (Svensson, 2021), Yellow is one of the central colors in traditional Chinese culture and a color that is present in their history since ancient times.

Green, associated with nature and vitality, green is the color of plants and symbolizes life (Okafor, 2020), represents growth, harmony, and balance. It is often used in cultural artifacts, such as jade carvings, symbolizing longevity and prosperity.

Black is believed to be the color of the sky and the Lord of all colors. The period of monochrome worship, black was worshiped the longest in Chinese history, (Zhao, 2014) And it also stands for honesty and justice in China. In the traditional Beijing Opera, the honest and good men all have the black faces to show their justice (He, 2009).

The original meaning of black in China is good, but because it is affected by the western culture, a bad meaning is added in it. Black is now seen as darkness and symbolizes evil, reactionary, sinister, terror, crime, illegal activities, banditry, fear, death, and other derogatory meanings. (Mei, 2016).

White symbolizes purity and mourning, In Chinese culture, white is contrary to red, it is a basic color taboo. It shows the Chinese's material and spirit disgust. In the traditional Chinese perspective, White makes people tend to think of solemn mourning (He, 2009) commonly worn during funerals and other solemn occasions. However, it also represents simplicity and clarity, reflecting the virtues of humility and sincerity. But in the opinion of Westerners, white symbolizes purity, elegance and frank.

Blue, particularly the shade known as "qing" (青), encompasses a range of meanings from tranquility to wisdom. In Chinese culture, blue is regarded as a solemn and holy color, pure and transparent, and full of hope (Chen,2022). It is often associated with Confucian ideals of moral integrity and intellectual refinement.

The significance of traditional Chinese colors extends beyond symbolism to various aspects of daily life. From architecture and interior design to fashion and cuisine, these colors infuse every facet of Chinese culture with their distinctive meanings and aesthetic appeal.

In traditional architecture, vibrant reds and golds adorn temples and palaces, reflecting the auspiciousness and grandeur of these structures. Similarly, in interior design, color schemes are carefully chosen to create harmonious spaces that evoke a sense of balance and prosperity.

In fashion, the choice of color carries social and cultural significance, with certain hues reserved for specific occasions or social statuses. For example, red is commonly worn during weddings, while white is avoided due to its association with death.

Even in culinary traditions, colors play a crucial role, with vibrant ingredients such as red peppers, green vegetables, and golden grains not only adding flavor but also imbuing dishes with symbolic meaning.

The concept of traditional Chinese colors offers a fascinating glimpse into the rich tapestry of Chinese culture and civilization. From the auspicious reds and golds of imperial grandeur to the serene blues and greens of natural harmony, each hue carries layers of meaning and tradition that continue to resonate in modern-day China. Understanding these colors not only enriches our appreciation of Chinese art and culture but also provides insights into the values and beliefs that have shaped one of the world's oldest civilizations.

2.2 Uses of traditional Chinese colors

Traditional Chinese colors have a wide range of uses and are involved in many fields, and some unique colors are produced in their respective fields. For example, most of the colors involved and produced in the dyeing and weaving industry are plant colors, due to the thin and transparent characteristics of plant colors and the advantages of plants themselves being easy to manage and renewable. In the porcelain industry, the colors chosen are mainly mineral colors and chemical pigments, mainly due to the stability and high temperature resistance of such colors. In the use of food, plant-based colors are mostly used, which takes into account the environmental protection and health of colors.

Regarding the uses of traditional Chinese colors, we divide them into three major categories based on the collected information.

One is basic use. The most typical feature of colors for this type of use is practicality, that is, more emphasis is placed on the benefits of the color rather than the color itself.

The second is development purposes. Colors for this type of use developed from basic uses. People began to shift their attention to color, paying attention to the beauty of the color itself and the aesthetics of the color.

The third is the expressive purpose. Colors for this type of use go beyond the color itself and add people's sensibilities, that is, people's emotions, thoughts, etc. can be expressed through color.

When it comes to the use of color, the primary consideration is its practicality, that is, its most fundamental nature. This kind of color often appears in people's clothing, food, housing and transportation, which meets people's most fundamental production and life needs. This type of color must have a definite material source, that is, the ancestors could make or use this type of color.

The early use of color as a record starts from the origin of traditional Chinese colors, Colors have been used since people had the awareness of beauty. The colors at

this time were mostly natural mineral colors and were mostly used for recording. black ash deposits in the habitat of the “Peking Man”⁸ in the Beijing area, from fires used 500,000 years ago. Chinese archaeologists are still discovering red powder deposits in the habitat of the “Upper Cave Man” in the Zhoukoudian area of Beijing, dated from between 100,000 to 18,000 years ago.⁹ The people of the Upper Cave culture used red powder (iron ore ground into powder) and black ash to decorate themselves, communicating information to each other via the primitive language of color. These primitive types of color communication can be thought of as the roots of ancient Chinese aesthetics (Zhou, 2018). However, the colors of this period did not have color names in our current sense, or they had been given a certain color name by the ancients, but there was no exact written record.

Medicine was one of the early fields where color emerged. For thousands of years, cinnabar has been used to treat different diseases (Zhou, 2009), Same as the colors recorded in the early days, the colors that appeared at this time were based on the practicality of the color raw materials, including cinnabar, patina, etc.

Color doesn't appear often in food. Plants such as red indigo grass, sophora japonica and indigo can all be used as food or food dyes. It is extracted from indigo-yielding plant species. To date, 31 plant species across eight different families have been used as sources of indigo (e.g., *Indigofera tinctoria* L. and *I. suffruticosa* Mill.). (Xu, 2020)

The aesthetic use of color, that is, considering the aesthetics of color. Color is separated from the most fundamental production and life. Almost all colors come from this field. Most of the colors that appeared in this period were named after objects, followed by colors with proper nouns. There are also a certain number of color nouns that use the method of arranging colors according to numerical values or the supplementary explanation method of using colors to modify colors.

According to our sorting out this type of colors, the most common fields are in dyeing and weaving crafts and paintings. Secondly, a number of colors are also produced in architecture and utensils, such as porcelain. In these fields, people fully exploit the characteristics of color. How to prepare, blend and match colors.

As a traditional Chinese craft, dyeing and weaving technology has made great contributions to enriching the content of traditional Chinese color terms. In the dyeing and weaving process, a large number of specific color terms appeared and are still used today. Colors such as crabapple red, green, willow yellow, and navy blue all appear in the dyeing and weaving process.

The ideographic use of color is to express people's subjective intentions through color. At this time, color is not only used as a color, but also as a modification, limitation, or descriptive word. This color may not necessarily have an exact color value or may appear only as an idea of the color. According to our analysis, expressive colors are often used in literary works. Secondly, the color of facial makeup in opera culture is also used for expressive purposes. In addition, the color used in religious paintings also has a certain expressiveness.

In literary works, we often hear descriptive words such as: blue sky, deep red blood, green grass, black eyes, etc. Such words are all colors that are more perceptive. Such words all carry people's subjective feelings, and they do not just describe the color itself, but have a certain literary nature. The color nouns appearing in literature can also be used as the basis for the classification of traditional Chinese color noun naming methods.

The color in opera culture adds people's subjective initiative. People give colors different personalities to interpret different characters. In the realm of Peking Opera, color not only contributes to visual aesthetics but also functions as a medium through which diverse character traits are conveyed. (He, 2015) Under this premise, even if the viewer does not know much about the character, he or she can judge the character's personality based on the color of the character's face.

Gold, malachite, cinnabar, lazurite, azurite and other colors are commonly used in religious paintings, and different materials and colors also represent different meanings. As early as in Shang and Zhou dynasties (1600 BC - 256 BC), people extracted blue pigment from azurite, and green pigment from malachite (Wang, 2022). lazurite was usually used as a symbol of the majesty and sublimity of heaven. lazurite was used as a pigment from the Jin (晋, 265–420 A.D.) Dynasties. Since then, lazurite

pigments have been found in major grottoes in the northern region (Chen, 2010), Lazurite were also used in the early Dunhuang murals (Shui 2022), This also reflects the expressiveness of color, that is, the meaning that people subjectively assign to colors. In addition, gold, silver, and cinnabar are often given special meanings, such as power, status, and brightness.

2.3 Traditional Chinese color concepts

In the vibrant tapestry of Chinese culture, colors are not merely pigments but carriers of profound meanings deeply rooted in history, philosophy, and societal values. Traditional Chinese color concepts have evolved over millennia, intertwining with mythology, cosmology, and cultural practices. This essay aims to delve into the essence of these concepts, shedding light on the symbolic significance and cultural applications of traditional Chinese colors.

2.3.1 Classification of traditional Chinese color concepts

The earliest records on five colours are found in several Confucian classics of the Warring States period (V-III cc. BC), and formed a relatively simple five-element color system. The theory matured and developed to its present form during the Later Han dynasty (25-220 AD) (Bogushevskaya,2016). Compared with the Western concept of color, it was proposed thousands of years earlier. For China, this color concept is not only a manifestation of the traditional national aesthetic psychology, but also represents the essence of national culture. (Figure 2.1)

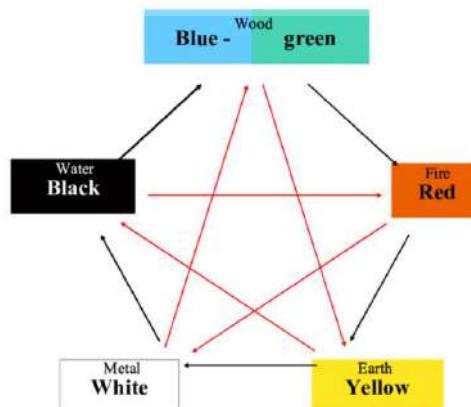


Figure 2.1 Five colors system

Source: Mantua-Kommonen,2008

With the continuous evolution of history, obvious class differentiation began to appear among people and the relationship between domination and being ruled gradually formed. At this time, color art also began to be divided like other arts and things, and two different color art schools were formed: the court scholar-officials and the folk. The color art of this kind of people often uses the unique color symbols of their ethnic group to display their artistic works, so that the works present different artistic charm and aesthetic characteristics.

The palace is a symbol of power and wealth, so luxury and magnificence are usually the main colors used. This use of color is often very typical in Tang Dynasty art in China. The Tang Dynasty had the most prosperous art and culture in Chinese history. Its artistic and cultural works and forms had a great impact on the entire world, and this also promoted the outstanding development of decorative arts in that period. Looking at the famous painting artists of the Tang Dynasty in China, in addition to the painting forms they are good at, most of them are often very good at decorative strokes. Among them, there is not only a display of the luxurious life of the royal family, but also a unique technique of expressing landscapes in a luxurious painting style. While showing the richness of the landscape, it also contains the elegance of the connotation of the landscape. Decorative painting was very popular in the Tang Dynasty in China, and its application range was very wide. The style and content of decorative murals were even more diverse.

In addition to the luxurious court painting style, a pale painting style also emerged among the literati and officials in the Tang Dynasty. Painters pursued elegant taste in the painting process, and their works often gave people a more elegant feeling. In paintings, works of this style often place more emphasis on the expression of artistic conception in the work and ignore the use of form and color. Therefore, the style of this type of works is often simpler and more elegant. Different from the luxurious court painting style, this style of painting paid more attention to the use of black and white in the works, and was more in line with the aesthetic needs of the visual art of that period. The development of this style of painting had a greater breakthrough in the Yuan Dynasty. In terms of the artistic conception of artistic works, literati and officials placed more emphasis on painting. As for the expression

techniques of their works, literati and officials placed more emphasis on the flexible use of ink.

There is a very obvious difference between the use of color in ancient Chinese folk and the use of color in the paintings of the court and literati. As far as the use of color among the people is concerned, people put more emphasis on the vividness, exaggeration and simplicity of color, which can often reflect the ordinary people's yearning for a better life. It can be said that the use of color styles in court paintings is often more accepted and loved by rulers, while folk paintings and color use are closer to the lives of the masses and often better reflect the core of traditional Chinese color use. As far as the color structure in the application of folk colors is concerned, it is often influenced by different folk-art forms, and is also closely related to the five elements and five colors mentioned above. Although the development trends between the two are quite different, they maintain very close ties. From the perspective of folk color concepts, the use of colors in the traditional clothing of the Han nationality is usually influenced by the concept of the five elements, and is divided into primary colors and secondary colors. Therefore, the use of clothing colors is often relatively simple and calm. The style of Chinese ethnic minority costumes is quite different from this, especially in the use of colors. They are often brightly colored and contrasting, showing the unique vitality of colors. In folk New Year pictures, the five-color system has also been widely used, and the awareness of boldness and behavior are limited. In folk New Year paintings, people are often accustomed to combining colors with strong contrast, so the color tone can often be highlighted very clearly.

2.3.2 Characteristics of traditional Chinese color concepts

As an ideal color based on free ideas, China's traditional colors not only fully demonstrate the aesthetic spirit, but also present a unique cultural color. Due to the influence of many factors such as folk customs, living environment and aesthetic taste, various ethnic groups have different understanding and development of colors, which gradually highlights the trend of diversification. Therefore, in the process of using traditional colors, modern designers should absorb their ideas and apply them to

design. We use red as the main color and match it with other colors such as yellow and black to study the main characteristics of color:

Red is the same color as primitive life (blood). It represents the historical precipitation of human life and is also the emotional color that can best release the power of life. The purity of red is relatively consistent in people's color vision. Therefore, in the color structure, red will never be manipulated by other colors regardless of the size of the area it occupies, that is, it cannot change the purity of red and give full play to its monochromatic effect. Since the Han Dynasty, rulers and ordinary people's love for red has gradually increased, which in turn has evolved the traditional color into a prosperous, auspicious or warm color. Therefore, in modern design concepts, as long as festive, auspicious and other related themes are displayed, people must first choose red. This color is generally approved by Chinese people and has been positioned as China's iconic color, enjoying the reputation of "national color". In traditional festivals, especially the Spring Festival, every household displays red, such as red couplets, red firecrackers, red flags, red clothes, etc. To this day, Chinese people still regard red as a color that wards off evil spirits. They still retain the custom of eating red eggs, and women in their sixties must wear red underwear and a red belt.

Chinese traditional culture is known as the "yellow civilization". It is obvious that the choice of yellow as the core color was mainly based on the environmental instinct of the predecessors. The ancient Chinese "Yin Yang and Five Elements" also placed the earth element, yellow as the symbolic color, in the center of the five elements, which also represents the status of the emperor. In all dynasties in Chinese history, yellow costume is reserved solely for the emperor (Mantua -Kommonen,2008). Since the Sui and Tang Dynasties, emperors of all dynasties have chosen yellow as their imperial color to demonstrate their imperial power and dignity. Moreover, in terms of palace architecture, clothing matching, etc., yellow and gold or red are often used to highlight the magnificence. Since red and yellow have the connotation of happiness, solemnity and sanctity in the traditional concepts of this nation, red and yellow are important symbols of wisdom and civilization. The red-yellow color scheme is relatively common among Chinese folk colors. In addition, the red and yellow color combinations in cloth dolls and paper-cut art also show a bright and

pleasing trend, and are favored by the majority of people. Therefore, the combination of red and yellow reflects the symbolic color concept to a certain extent.

In primitive society, there was already a combination of red and black. In the color structure of ancient China, red and black are also widely used colors. The so-called "red" actually refers to vermillion. Due to its extremely high brightness and strong luster, this color concept is mostly used in ancient porcelain or pottery. From ancient times to the present, black has been used in Chinese culture to express an elegant and simple artistic conception, while red is a symbol of celebration, auspiciousness, happiness and enthusiasm. Among traditional Chinese colors, the red and black configuration has always been deeply loved by the majority of people, and at the same time shows a trend of multiculturalism.

Symbolic and allegorical. According to a psychological study, color is the most likely to trigger strange associations in people, and it is also the most likely substance to stir up human emotions. The color effect is not only presented visually, but also in a symbolic sense, thereby allowing the public's psychology to be experienced, understood and satisfied. Color symbolism is the spiritual basis and content of ancient ethnic groups' use of color. Its formal characteristics are mostly simple color use and contrast, which has a certain degree of spontaneity, inspiration and universality. On the surface, it seems that when a primitive nation chooses color symbols, it will inevitably be affected by the color concept of the nation's specific background. However, no nation is divorced from the nature of primitive colors. China is an ancient civilization with a long history, and it is the first country in human history to use symbolic colors. It has always insisted on the symbolic meaning of colors for all ethnic groups.

The hierarchy of colors. In ancient times, emperors of all dynasties built a magnificent color system based on the five elements, which fully reflected the philosophical concepts of the predecessors, with strong social hierarchy ideas and clear color meanings. And in different classes of society, people also imprint the colors on different classes. The difference in color also implies the hierarchy. For example, red doors and red walls are the unique "forbidden colors" of the imperial

palace. The yellow and white color has a mysterious meaning and has some special meaning. The hierarchy of colors is also reflected in clothing. Many colors need to be used according to different occasions, identities and statuses, and must not be used randomly. connection between the presented historical Chinese colour theory of Wu Xing and contemporary colour culture residing in the issues of power and control. For thousands of years the Chinese society has been strictly controlled, and during the emperors' regime even the use of colours was controlled (Mantua-Kommonen,2008). For example, Qin Shihuang preferred black. Because he was deeply influenced by the "Yin Yang and Five Elements Theory", he regarded black as the most noble color and made necessary adjustments to the color of his clothing. Later, emperors of all dynasties regarded yellow as the royal color. Emperors who ascended the throne had to wear yellow robes.

The good and bad luck of color. Color, as a special psychological suggestion or meaning, is often used to satisfy a specific color image. In Chinese civil society, the majority of people understand and use colors according to their own interests or wishes. Since color itself has some connection with nature, society, life, etc., the cultural connotation displayed must be friendly, sacred, and beautiful. For these meanings, people often summarize them into many aesthetic connotations such as "prosperity and peace", "good luck" and "praying for blessings and good fortune". Chinese folk colors are easily deeply influenced by ideology, so they represent concepts of good and bad luck. For example, the most outstanding thing is the understanding and application of red. The ancient royal family regarded red as privilege and wealth, symbolizing solemnity and authority. Among the people, many people also use red to convey auspiciousness during important festivals and wedding occasions. However, when holding funeral ceremonies, black and white are often used to express mourning. As white is an achromatic color, it represents sadness. It is true that there are huge differences in color applications in different regions. For example, presenting hada to guests is a unique etiquette of Tibetan people, and Tibetan people use white hada to express purity and luck when worshiping Buddha, building houses, and repenting.

2.4 The application of traditional Chinese color concepts in modern design colors

In terms of color in folk paintings, the ancients attached great importance to the use of primary colors, and at the same time, they also showed a certain sense of complementary colors when matching colors. Most of the colors used in folk art pay attention to bright contrast and strong complementary colors, and they like to use pure colors for contrast. For example, the clay sculptures and horse spoons made by Hu Xinmin, a famous folk artist in Feng Xiang County, Shanxi Province (Figure 2.2). This view of color has a great inspiration for color modeling in modern design. Taking New Year pictures as an example (Figure 2.3), the door god is one of the most common figures. There are two main types, one is the red-faced Yuchi Gong, and the other is the white-faced Qin Shubao. In form, they are divided into two types: positive image and partial image. See Figure 6. From the perspective of color alone, the portrait of the door god only involves five primary colors, and the combination is extremely simple, but the overall visual effect is very gorgeous and colorful. It reveals strong decorative color features and is also rich in profound cultural heritage.



Figure 2.2 Clay sculptures

Source: Deng,2021



Figure 2.3 New Year pictures

Source: Lv,2022

When predecessors created folk art works, they mainly focused on controlling the size, shape, and spacing of color blocks to highlight the decorative colors in the overall color and create a visual impact on the audience. This is reflected in modern art design. Also useful. Folk colors emphasize simplicity, and mainly use techniques rather than a large number of colors to present the characteristics of color changeability and vividness. Designers apply this to modern graphic design, which can make the work more nationalistic and in line with the public's aesthetic psychology. The ideological connotation contained in the work itself will be more easily accepted by viewers. Mr. Chan Yoo-kin, a famous designer from Hong Kong, China, embodies these elements in many of his designs. In particular, the image LOGO "Sixiwa" pattern he personally designed for his company fully embodies the simplicity and impact of folk color design (Figure 2.4).



Figure 2.4 Sixiwa LOGO

Source: Chen,2022

In addition, taking posters as an example, simplicity and clarity are their main features. As a form of promotional poster, the basic requirement of poster design is to enable people to quickly see and understand the promotional information that the designer wants to express from a certain distance. For this reason, designers often adopt assumptions when creating. On the basis of retaining the key points, all other unimportant details or backgrounds are deleted as much as possible, and activities that occur in different time and space and at different proportions are combined together through certain techniques to stimulate people's imagination. Therefore, for designers, conception must override reality, the image must be as concise as possible, and appropriate use of exaggerated techniques and contrasting colors highlight the actual connotation of the work and express promotional information. At the same time, it also allows viewers to use their imagination through existing pictures, connect them with scenes in real life, and experience new meanings.

As one of China's most ancient cultural symbols, Tai Chi uses black and white colors and some abstract symbols to express the ancients' traditional philosophical views and understanding of the universe. Among them, white is the color of light and is regarded as the origin of all colors: while black represents nothingness and symbolizes the disappearance of light. Through the contrast of these two colors, Tai Chi Diagram fully expresses the simple philosophical theory of "yin and yang complement each other" and "the extremes of things must reverse themselves". At the same time, the "S" shape in the Tai Chi Diagram also reflects the traditional aesthetic concept of "the complementarity of virtuality and reality", which has played a positive role in promoting the development of modern Chinese design concepts. Influenced by this concept, the color concepts of black and white, virtual and solid are still widely used in graphic design, mainly reflected in the contrast between positive and negative shapes. Graphic design with Tai Chi diagram as the main element can be seen everywhere in modern life, especially in the graphic design of various types of event advertisements. For example, the icon of Phoenix Satellite TV draws on the "Tai Chi Diagram" color concept and cultural spirit (Figure 2.5).

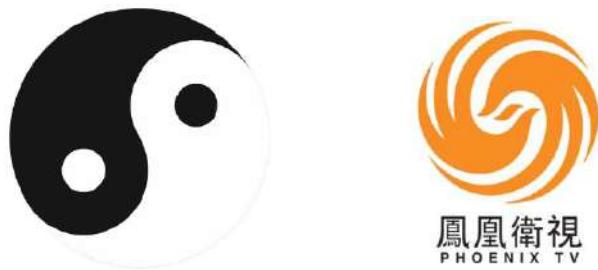


Figure 2.5 Phoenix Satellite TV

Source: Jin, 1996

Confucius believed that color does not express spatial orientation, emotional expression or visual impression, but a symbolic color that corresponds to the order in society and is closely integrated with Confucian thought and culture. The Confucian view of color mainly emphasizes that one's inner noble qualities can be highlighted through the use and grasp of external colors. This analogical thinking has a profound influence on the development of Chinese color art. For example, most of the facial makeup in Chinese dramas is colorful and rich in graphics. The different colors and patterns on the facial makeup often contain specific meanings and are directly related to the character's personality and moral character. This is influenced by the color concept in Confucianism. Generally speaking, red in facial makeup represents a brave and loyal character, yellow represents toughness and bravery, black represents an upright character, and white is often associated with cunning, cunning, and sinister villains. In addition, China's "Bide" color concept in Confucianism provides many inspirations for the use of color in modern graphic design. For example, the color red is deeply loved by the Chinese people because it symbolizes good luck, happiness and other good things. Through research and experiments, scholars have discovered that in addition to arousing people's psychological feelings, colors can also symbolize people's emotions. These profoundly reflect the influence of Confucian color concepts on modern design color concepts (Figure 2.6).



Figure 2.6 Facial Makeup

Source: Zhongqing Online,2018

Taoism believes that the inner perceptual world of human beings and nature are harmonious and unified. This kind of thinking has a great influence on the view of "imagery" in Chinese art design. Taoists advocate nature, pursue plainness and tranquility in their use of color, and are opposed to the traditional five-color view. The aesthetic thought of black in Taoist thought directly established the color status of black in Chinese paintings, and also had a certain impact on the color aesthetics and art culture of traditional Chinese paintings. For example, it can be seen from China's early painted pottery decorations, silk paintings, and lacquer paintings that the ancients attached great importance to black. By the late Tang Dynasty, with the emergence of ink painting, the importance of black in paintings became more and more prominent, and painters' color techniques became more and more mature, and they were able to flexibly elevate ink color above other colors.

In the modern design process, incorporating traditional Chinese colors is not just a simple and mechanical repetition, but should present novel design content under a new design framework. In fact, this requires designers to pay attention to exploring the connotation and meaning of traditional colors in daily graphic design, and inject modern color design concepts, so that the designed works have a certain degree of innovation. The artistic aesthetic of traditional colors will also bring rich design inspiration and diverse aesthetic ideas to designers, and provide a large amount of materials and information to inspire their design thinking. Therefore, inheriting China's excellent and positive cultural traditions is an important prerequisite for current design and innovation. Breaking away from the outward expression of

traditional aesthetics, injecting the essence of modern aesthetics, and integrating design with fashion elements has become an innovation in modern design. Therefore, it is necessary to fully understand the artistic aesthetics of traditional Chinese colors and selectively absorb cultural traditions according to the actual social development. This is very necessary for most graphic designers in China. Human visual communication determines the combination of traditional colors and modern concepts in the design process. It should not only help strengthen communication and interaction with local audiences, but also help further spread Chinese traditional culture and expand international cultural radiation and influence. In modern design, the use of traditional colors is very popular and is easily accepted by consumers. Especially in the current era of competition, traditional colors must have a strong sense of the times and demonstrate national pride. Therefore, any design with traditional connotation should conform to the characteristics of modern aesthetic art.

On the other hand, the concept of modern design pays more attention to the personal feelings that visual psychology brings to people. Therefore, it is an inevitable requirement of the development of the times to infiltrate design concepts into the use of traditional colors. Different regions have promoted the emergence and development of multiculturalism, realized cultural exchanges across regions, across time and space, and across nationalities, and maintained two-way communication and interaction. Chinese traditional culture helps promote the development of world culture. It has become an important part of world culture and has a certain role in improvement and innovation. As cooperation and exchanges between China and other countries become increasingly closer, the collision and integration of foreign culture and China's excellent traditional culture heralds a gradual qualitative leap in culture and art.

Chapter 3

Research Methodology

3.1 Application of traditional Chinese colors

In order to study traditional Chinese colors in depth, this study will collect data from multiple fields, including murals, architecture, books and ceramics, in order to obtain comprehensive and diverse information.

As a visual record of ancient culture, murals reflect the aesthetic and color choices of the society at that time.

I chose Dunhuang murals as my research reference. Dunhuang murals, located in Dunhuang County, Gansu Province, China, were built in AD 366 and took more than 1,600 years to paint to their present scale.

Dunhuang Mogao Grottoes mural rare cultural treasures; Its grand scale, rich content and long history rank the crown of China's national grottoes, and it is also the largest and best-preserved grottoes art treasure house in the world.

Because many of the paintings are located in caves that avoid light, and because the pigments used are mostly mineral pigments, their colors can be preserved for thousands of years.

The early murals of the caves of the Northern Wei Dynasty(Figure 3.1) have strong emotional exposure, dynamic and obviously exaggerated figure modeling, the expression method of drawing with strong thin lines and focusing on smudging, and the form of decorating the substrate with red patterns, slender bodies completed with sensitive and varied lines dominated and artists paid less attention to three-dimensional rendering accomplished by using thick and vital colors(Song, 2021).



Figure 3.1 The Northern Wei Dynasty (AD 386 ~ 534 Year)

Source: Zhao,2006

The Northern Zhou Dynasty

The style of The Northern Zhou Dynasty (Figure 3.2) was usually large-scale Jataka and Buddhist story comic books, all of which were outlined with smooth lines on white walls, with concise and vivid shapes and clear and elegant colors. Although some skin was slightly three-dimensional and still had the Western painting style, on the whole, from image to artistic style, it began to turn to traditional Han painting.



Figure 3.2 The Northern Zhou Dynasty (AD 557 ~ 581 Year)

Source: Fan,2006

In the Sui Dynasty (581 -618), western influences from India were again felt: proportions of the human body became more naturalistic, appearing as if the figures were capable of moving (Song, 2021). From the perspective of content, the mural paintings of this period were much richer than those of the previous dynasties, more colorful in color and more extensive in performance. Due to the influence of Buddhism, the most popular at that time was the Buddhist Pure Land School, so the performance of Dunhuang mural paintings was mostly about the story of Buddhist Pure Land School.



Figure 3.3 Sui dynasty (AD 581 ~ 618 Year)

Source: Duan,2006

The subject matter is very rich and varied, the scenes and plots are handled in a real and interesting way, the movements and expressions shown are more diversified than those of the previous generation, and there are a variety of vivid gestures of sitting, standing, walking and flying. In particular, the image of Bodhisattva in the Tang Dynasty is an important example of the successful combination of ideal and reality in ancient art (Figure 3.4).

In China beginning in the Wei-Jin, Southern, and Northern Dynasties, blue-green landscape 10 gradually became the main theme in the literati painting instead of remaining as the background features. Soon, it developed into an independent style that influenced Dunhuang through cultural communication in the Tang dynasty (Zhao, 2020).



Figure 3.4 Tang Dynasty (AD 713 ~ 755 Year)

Source: Shi,2006

The style characteristics of the murals in the Song Dynasty experienced the prosperity of the Sui and Tang dynasties (Figure 3.5). Due to the historical development, After the Tang Dynasty, literati art gradually took over the leading role among all the art forms in ancient China; folk art, including mural art, was no longer popular (Feng, 2010). Dunhuang art also turned from prosperity to decline. The theme of the cave murals in the Song Dynasty was mainly Sutra paintings with strong decorative patterns. The color is more concise and brighter, the tone is cold, the color system is relatively unified, the brightness difference is small, and the color contrast is used to surprise the picture.



Figure 3.5 Song dynasty (AD 960 ~ 1279 Year)

Source: Guan,2006

The Palace Museum in Beijing was chosen as the architectural reference because its protection was the most complete (Figure 3.6).

The Imperial Palace is the imperial palace of the Ming and Qing dynasties of China, formerly known as the Forbidden City, located in the center of the central axis of Beijing. Centered on the three main halls, the palace covers an area of about 720,000 square meters, with a construction area of about 150,000 square meters, and has more than 70 large and small palaces.



Figure 3.6 The Palace Museum

Source: Researcher

3.2 The origin of traditional Chinese colors and craft materials

Traditional Chinese colors are made from a variety of materials, which can be roughly divided into four types: natural mineral pigments, plant pigments, synthetic pigments and a small number of animal pigments (Figure 3.7).



Figure 3.7 Raw material
Source: Cartwright, 2016

The selection of mineral pigments is the most straightforward and simple, and the actual operation of preparing pigments is also easier. However, with the increase in the demand for pigments and the mining of mineral pigments, and their unique short-term non-renewable properties, the number of mineral pigments is getting smaller and smaller (Figure 3.8).



Figure 3.8 Mineral raw material
Source: Researcher

Plant-based pigments are the most widely used and easily available pigments, and the raw materials are short-term renewable. But its disadvantage is that the color will gradually evaporate over time, which has certain limitations in preservation.

For example (Figure 3.9), the mature fruits of *Gardenia jasminoides* exhibit hues of red and yellow and have been historically employed as a natural dye source for over two millennia (Niu, 2024). Low cost has become an important factor in its popularity and Figure 2 Turmeric, which is also used to dye yellow. But they all have a fatal flaw is the color fastness is very low, cannot make the color preservation for a long time.



Figure 3.9 Gardenia and Turmeric

Source: Researcher

But the color fastness of some of these plants is very good. For example (Figure 3.10), indigo and *Cudrania tricuspidata*.



Figure 3.10 indigo and *Cudrania tricuspidata*

Source: Researcher

Cudrania tricuspidata Records from During the Western Zhou Dynasty (1046 ~ 771 BC) began to use it as a clothing dye (Zhao, 2014), because the tree growth is extremely slow, so very precious, only used for imperial robes dyeing.

Indigo Among all kinds of plant dyes used in ancient times, Indigo was the earliest and most used. Indigo dyeing in China dates back 3,400 years (Zhang, 1980). Indigo continues to be used to this day.

These two plants have excellent color fastness, can be preserved for a long time without fading, and are important planting and dyeing materials in ancient times.

Animal-based pigments are rarely used. The rare pigments are mostly derived from insects or smaller species. There are certain limitations in the materials used, so the quantities used are very small.

For example, magenta is made by drying female cochineal insects (Figure 3.11), grinding them into powder, grind the bugs to powder. Then the powder is paired with salts to isolate carmine — the commonly sold product of cochineal insects that's 50 percent to 60 percent carminic acid (Miller, 2022), and then treating it with alum to remove impurities. At present, it is widely used in high-end cosmetics, such as lipstick.



Figure 3.11 Cochineal insects

Source: Martirosyan, 2022

There is also an important color purple, purple has been a symbol of imperial power since ancient times, the reason is because purple dyes are too rare. Normal colors in this spectrum are hard to find natural dyes on Earth.

Tyrian purple become an important source of the color (Figure 3.12), the west began to use a lot in the 3th century BC, this dye production was a hugely costly

process, due in no small part to the difficulty involved in extracting the dye from its source: the sea-molluscs known as the purpura and murex. crushing hundreds of thousands of the smaller specimens whole to produce dye in sufficient quantities for use (Stocks, 2014), extracting 1 gram of Tyrian purple requires about 10,000 shellfish (Anonymous,2016), with its dyed clothes, will have a smell and strong fishy smell that seems to be just as permanent as the color itself (Sandberg,1996), but its advantages are also plants cannot reach, that is, the color lasting. Purple has been very precious since ancient times and is a symbol of imperial power. But so much demand that the snails were almost wiped out.

Although China has a long coastline and shellfish resources, and historical materials also reflect that shellfish purple was once popular in the wartime era, there has been no physical evidence (Zheng, 2011). China mainly uses *Radix arnebiae* and *Laccifer lacca*.



Figure 3.12 Tyrian purple

Source: Violante,2007

The discovery of synthetic pigments was somewhat accidental. For example, new pigments are discovered accidentally in smelting, pharmaceuticals, etc., and are subsequently recorded and promoted. Except for some synthetic pigments with stable properties and relatively clear production processes, such as patina, Vermilion and other colors.

Vermilion (Figure 3.13), for example, is extremely valuable because pure vermilion is very rare in nature. However, the Chinese only love red, the pure red demand is very large, archaeological discovery in China from 200 BC to 101 BC, the Western Zhou Dynasty, there has been mercury sulfide vermilion synthetic pigment,

Chinese science and technology was highly developed long before western civilisations appeared. The Chinese developed vermillion around 2000 years before the Romans used it (Barnett, 2006), so this bright red is also known as "China red" in the West.

The production of some synthetic pigments is relatively troublesome and dangerous, and some pigments have certain instability in specific use and storage. Therefore, the scope of use is not as wide as mineral pigments and plant pigments.



Figure 3.13 Vermilion

Source: Researcher

3.3 Survey on traditional Chinese color cognition

The purpose of the traditional color user survey is to understand the current people's cognition, preference and application of traditional colors, as well as to explore their attitudes and views on traditional colors. By collecting feedback and views from users, we can more comprehensively understand the status and significance of traditional colors in contemporary society, and provide references and suggestions for the protection, inheritance and innovation of traditional colors.

This survey will cover a wide range of respondents, including design professionals, culture enthusiasts, and the general public. Through the participation of different groups, we will get diverse opinions and feedback, which will help us to grasp the current situation and future direction of traditional colors more accurately.

A total of 65 people participated in this survey in the form of questionnaire. The purpose of this survey is to understand users' awareness and attitudes towards traditional colors (Figure 3.14).

The main contents of the survey are to understand the participants' cognition degree and understanding channel of traditional colors, the participants' preference degree of traditional colors, and the demand for related products.

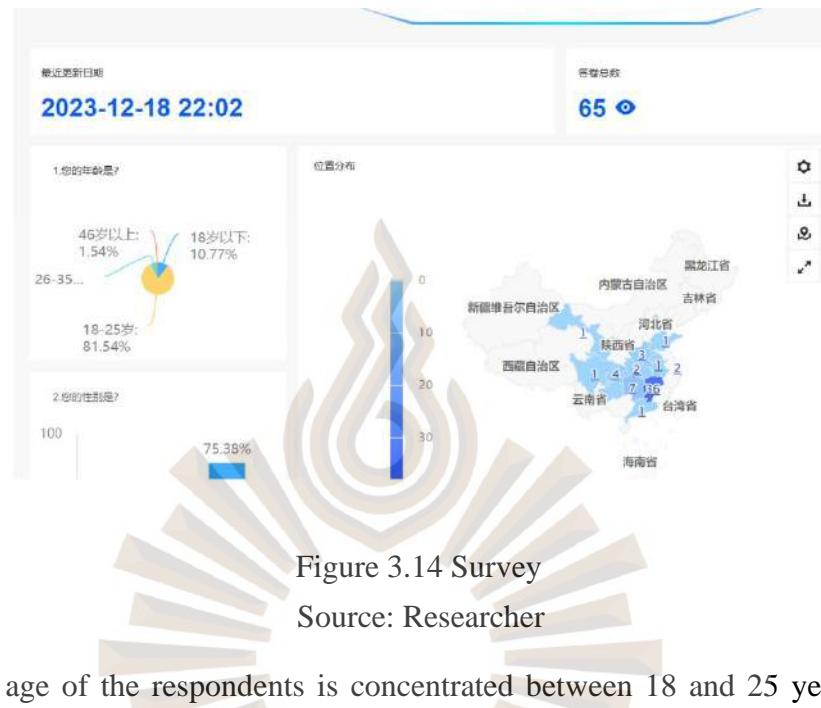


Figure 3.14 Survey
Source: Researcher

The age of the respondents is concentrated between 18 and 25 years old, and more young generations can provide more reference value for the data. The occupational divisions are relatively average, which means that there will not be over-representation of a specific occupational group, thus reducing bias and bias and ensuring the objectivity and reliability of the survey results (Figure 3.15).

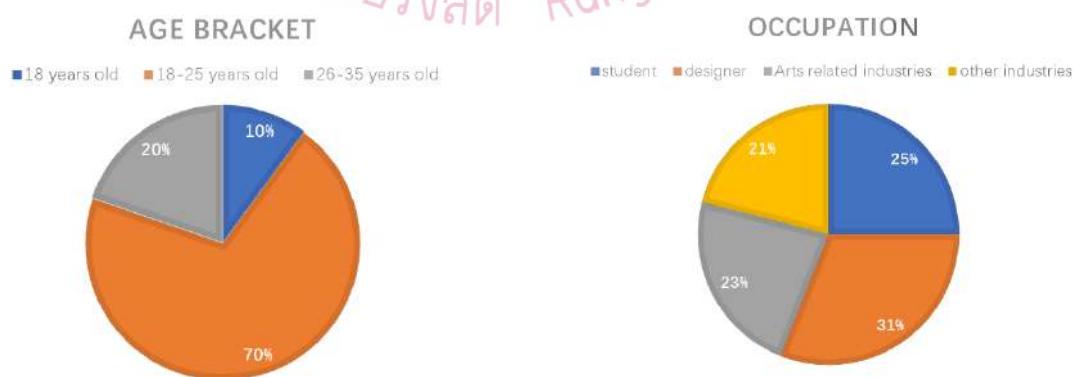


Figure 3.15 Age and Occupation Division
Source: Researcher

When asked whether you know about traditional Chinese colors, 77 percent of the respondents do not know at all, 16 percent know a little about it, and only 7 percent are familiar with it. It can be seen from the data that most people have a large gap in their cognition of traditional Chinese colors and lack of understanding and cognition.

At the same time, let's start with another question, "Do you think it is important to preserve and inherit the cultural value of traditional Chinese colors?" From the survey results, we can see that those who think it is important have an absolute advantage. It is not difficult to find that in fact, there is a consensus on the importance of traditional culture, but due to the lack of cognition, there is a lack of attention to and understanding of traditional culture. This highlights the importance of raising awareness and promoting understanding of traditional Chinese colors (Figure 3.16).

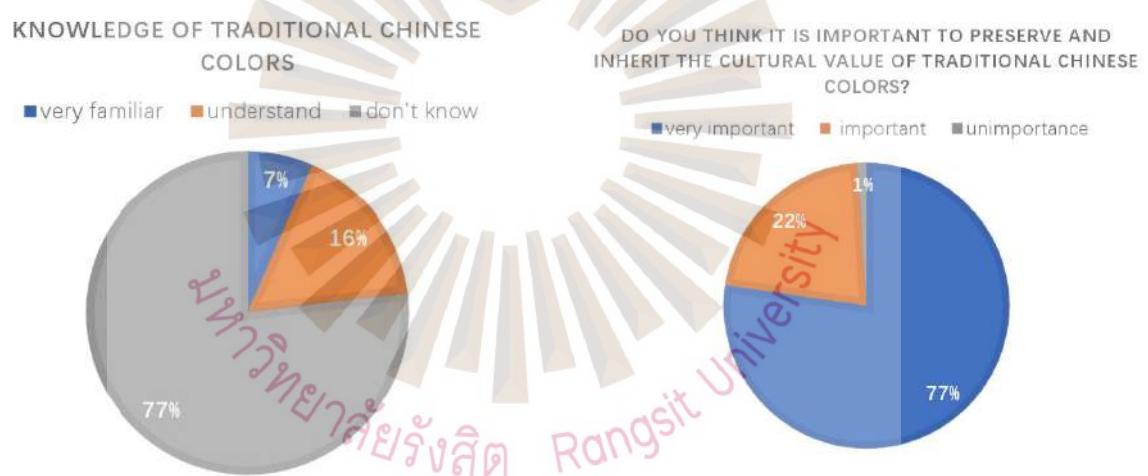


Figure 3.16 Cognitive survey

Source: Researcher

Chapter 4

Design Experience

4.1 Design Concept

The design concept of traditional color cards encompasses a reverence for cultural heritage, an acknowledgment of the historical significance of colors. It integrates the essence of colors deeply embedded in the nation's history and cultural practices, translating them into a tangible format that can be used as a reference in various fields, particularly in art and design.

Then combine this knowledge to create a color value set, and provides a color reference for the majority of young designers. It can not only understand the development history of Chinese color art, but also has a certain reference value for promoting color aesthetics in excellent traditional Chinese culture and modern design color art.

4.2 Material collection

In the early stages of color research, collecting materials is a critical step that lays the groundwork for understanding the depth and breadth of color's significance across different cultures and historical periods. Expanding on the collection of various books and documents.

4.2.1 Various books and documents

Exploring various types of books and documents, such as photographs of artifacts, books of historical artifacts, and historical documents, is key to understanding the cultural and historical context of color. These resources provide valuable references.

For example (Figure 4.1), the map of a Thousand Li of rivers and mountains was drawn in the Northern Song Dynasty, about 900 years ago, and was drawn with mineral pigments, which has been preserved until now.

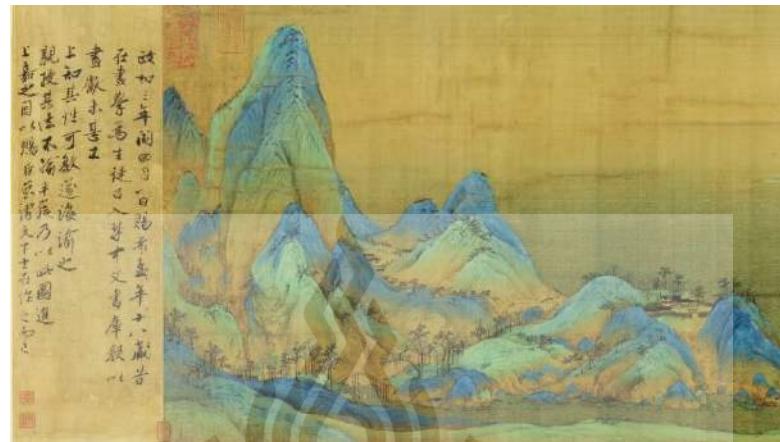


Figure 4.1 《A thousand Li of rivers and mountains》

Source: SINGER,2024

The moment Dunhuang was born, it was destined to be extraordinary. The Mogao Grottoes are a splendid artistic treasure house of ancient Chinese civilization

Dunhuang murals are of great cultural and historical value, and these murals found inside the Mogao Grottoes are a treasure trove of ancient Buddhist art, depicting a wide range of themes from religious texts to daily life in ancient China (Figure 4.2).

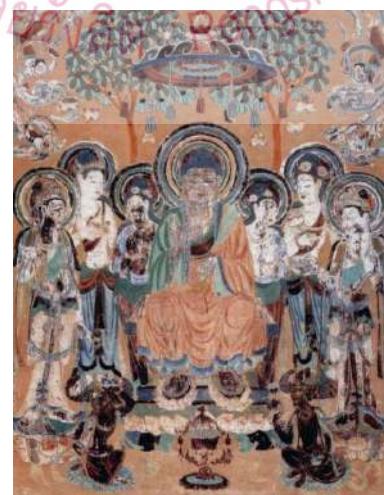


Figure 4.2 Grotto NO.322 Preaching

Source: Duan,2006

China has a large number of ancient buildings, and the vast area has produced a rich variety of architectural styles, each with its own unique patterns and colors. There are a large number of decorative patterns and color combinations in these ancient buildings, and collecting them can better help analysis (Figure 4.3).

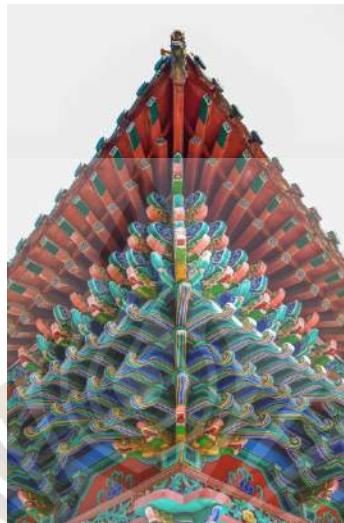


Figure 4.3 Architectural pattern

Source: Researcher

4.2.2 Raw materials collection

Collect plants, minerals and other raw materials, take photos of their research, search for their sources and uses. They can be better understood through observation and study of objects. There are mainly two kinds of minerals and plants (Figure 4.4).



Figure 4.4 Plant: Gardenia & Mineral: Lapis lazuli

Source: Researcher

4.3 Color extraction

This part will introduce the process and method of color extraction. Mineral color I will use Orpiment as an example demonstration to show how to convert mineral raw materials into color samples.

The color extraction of minerals is usually done by direct grinding. Minerals are crushed into smaller pieces and thoroughly washed to remove impurities. They are then ground into a fine powder (Figure 4.5).

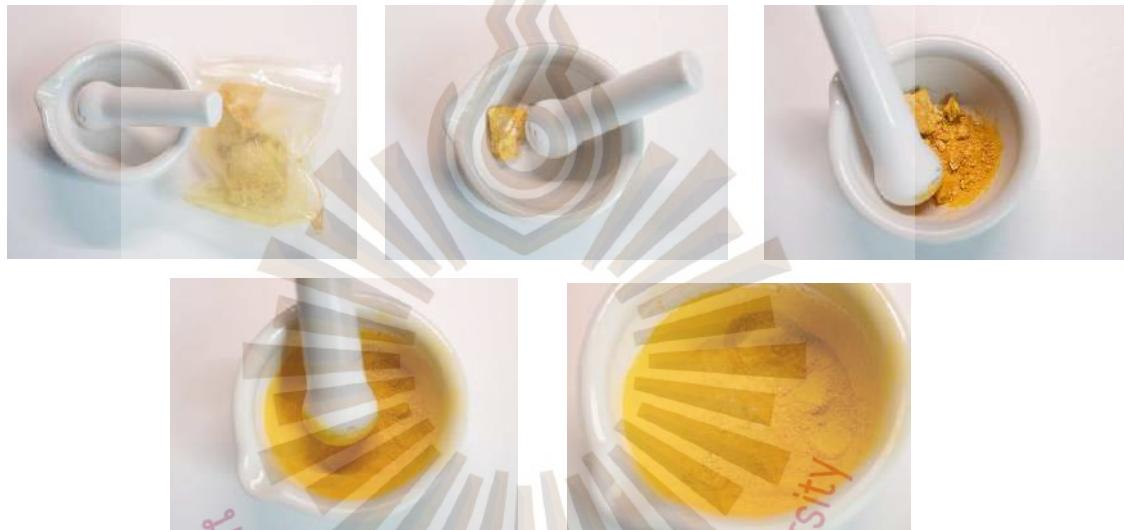


Figure 4.5 Orpiment extraction process

Source: Researcher

There is also a way of grinding, but also need to go through the washing process, need to repeatedly clean the particles after grinding, using the gravity of the size of the stone particles, as well as the principle of the glue floating in the water (Figure 4.6), to separate the thickness of the pigment, you can get different sizes of particles, so as to get different shades of color.



Figure 4.6 Water washing process

Source: Researcher

4.3.1 Photographic collecting

For color collection, in addition to collecting pictures of various historical relics, I also processed the raw material samples I collected and colored them on paper. Since professional equipment is extremely expensive, I will collect their colors by photography, using Nikon Z7II, a relatively professional mirrorless camera, to shoot in an indoor sealed and stable light source. Fill light with Nikon SB-910 flash with a uniform color temperature of 5000K (Figure 4.7).



Figure 4.7 Pigments testing

Source: Researcher

4.3.2 Photoshop collecting

I will extract the color areas of all kinds of pictures collected before and raw material photos taken by Photoshop (Figure 4.8).



Figure 4.8 Photoshop collecting

Source: Researcher

Collect different parts of similar colors from different pictures, and finally select the color closest to the middle.



Figure 4.9 Photoshop collecting 2

Source: Researcher

By finding relevant traditional color research materials, collecting and matching their past names and information.

Color	Hex code	Name	Implication	Example
#C88033	橘黄	Plus: Yellow Description: The color of the sun, the color of the autumn leaves, and the orange color of the sunset. The color of the sun is the color of the capital color in 201 AD. Yellow represents power and since then people have been influenced by it.		
#D9B84D	黄柏	Plus: Green Description: The color of the tree of life, the color of the autumn leaves, the color of the sunset, the color of the sun, the color of the capital color in 201 AD. Yellow represents power and since then people have been influenced by it.		
#F0E68C	明黄	Plus: Yellow Description: The color of the tree of life, the color of the sunset, the color of the sun, the color of the capital color in 201 AD. Yellow represents power and since then people have been influenced by it.		
#E69138	苏梅	Plus: Yellow Description: The color of the tree of life, the color of the sunset, the color of the sun, the color of the capital color in 201 AD. Yellow represents power and since then people have been influenced by it.		
#A55A3A	赭色	Plus: Yellow Description: The color of the tree of life, the color of the sunset, the color of the sun, the color of the capital color in 201 AD. Yellow represents power and since then people have been influenced by it.		

Figure 4.10 analyze

Source: Researcher

4.4 Final design

The design inspiration of this book comes from the combination of traditional colors and photography. Traditional colors in China are mostly associated with objective things and natural phenomena, so my design takes photos related to the color background and matches with the color information I have collected, so that the designer can have a deeper impression on the color feeling while using colors. In addition to the color reference part of the book will also make some brief introduction to the ancient common color raw materials (Figure 4.11).



Figure 4.11 photography

Source: Researcher

By combining with photos, traditional color cards only have a single-color information. Although traditional color cards provide accurate color values, they often lack the perception ability to put colors in the actual environment, and the combination

of colors and photos provides a related color perception for colors. This design theory broadens the application range of color cards, through the combination of vivid photos and colors, while providing color numerical reference, it can provide better color perception, so that non-professionals can also understand these colors. (Figure 4.12)



Figure 4.12 The Final product

Source: Researcher

Chapter 5

Conclusion and Recommendations

5.1 Conclusion

In the framework of artistic development, color has always played an important role. Chinese traditional color contains rich excellent cultural heritage, which is the complex reflection of social civilization, humanistic customs, art and literature, festival folk customs, ideology and aesthetic judgment. The names of traditional Chinese colors come from animal colors, plant colors, mineral colors, and also from classics, history subsets, poems, which are the materialized forms of ancient Chinese color experience and humanistic feelings, reflecting how ancient people viewed nature and the concept of looking at the world, and integrated in the names of traditional colors. The formation of modern color concept is also an extension on the basis of history and under the influence of social and cultural environment.

The exact colors of ancient times are no longer known, Therefore, for the understanding of traditional colors, we rely more on historical documents, artistic works and archaeological findings and other evidence. I think we should now be more about identifying their range of colors rather than specific colors. At the same time, what we lack now is more of a unified set of standards and common understanding of them, through the study of ancient Chinese colors, The design of a traditional color value reference book can provide a new generation of designers with color reference when designing. In the design requiring traditional Chinese color style, it can quickly provide a rough color range reference or color matching and provide accurate color values for the convenience of designers. At the same time, it also has certain educational value, not only for designers, but also for the General public to get the cognition and perception of traditional colors. Through the introduction of pictures and materials in the book, the cognition of traditional colors can also be improved.

5.2 Recommendations

Thank you, the recommendations, provided by three experts, Assoc. Prof. Dr. Sant Suwatcharapinun, Asst. Prof. Prakaikavin, and T-ra Chantasawasdee, in the "MFA thesis Master Processing" committees provided the following suggestions.

5.2.1 the content could be richer, and at the same time, I could use the materials I collected for some interactive experiences, so that users could better experience and integrate into it.

5.2.2 Add color trends from year to year, rather than just a simple color card.

5.2.3 There should be more content for children and teenagers, so that more young people know them and not just designers.



References

Barnett, J. R., Miller, S., & Pearce, E. (2006). Colour and art: A brief history of pigments. *Optics & Laser Technology*, 38(4–6), 445–453. doi.org/10.1016/j.optlastec.2005.06.005

Bogushevskaya, V. (2016). Ancient Chinese ‘Five Colours’ Theory: What does its semantic analysis reveal. *Essays in Global Color History*, 225–244. doi.org/10.31826/9781463236632-017

Chen, G. L. (2010). Analysis of pigments and clay of the polychrome statue and wall paintings in the No. 9 Tiantishan Grottoes. *Sci Conserv Archeol*, 22(4), 91–96.

Chen, S., & Chu, J. (2022). A study of the cultural significance of traditional colors in Chinese movies. In *Proceedings of the 2022 6th International Seminar on Education, Management and Social Sciences* (pp. 1362–1368). doi.org/10.2991/978-2-494069-31-2_161

Feng, Y. (2010). Dunhuang art in the context of contemporary art. *The Silk Road*, 2010(24), 64-66.

He, G. M. (2009). English and Chinese Cultural Connotation of Color Words in Comparison. *Asian Social Science*, 5(7). doi.org/10.5539/ass.v5n7p160

He, W. (2015). On the color study of Peking Opera facial mask. *Art Science and Technology*, 2015(4), 138-139. doi.org/10.3969/j.issn.1004-9436.2015.04.121

Li, X., & Deng, X. Z. (2024). Application Value of Traditional Chinese Color Names in Fashion Industry. *Progress in Textile Science & Technology*, 46(1). doi.org/10.19507/j.cnki.1673-0356.2024.01.001

Lin, Z., Wu, Y., Lin, Z., & Mei, H. (1980). Briefing on the cleanup of Baiyan cliff cave in Wuyi Mountain, Chong’ an. *Fujian Cultural Relics*, 6, 12–20. doi.org/10.13619/j.cnki.cn11-1532/k.1980.06.002

Mantua-Kommonen, K. (2008, October). *Colour culture as a visualisation of values and emotions case*. Paper presented at the Design & Emotion Conference 2008 International Conference, Polytechnic University Hong Kong. Abstract retrieved from https://www.researchgate.net/publication/288411169_Colour_culture_as_a_visualisation_of_values_and_emotions_case_China

References (continued)

Mei, Z. (2012). The Special Meaning of Color Words in Chinese and Western Culture. *Overseas English 海外英语*, (23), 255-256.

Miller, B. J. (2022, March). Scientists are making cochineal, a red dye from bugs, in the lab. *Smithsonian Magazine*. Retrieved from <https://www.smithsonianmag.com/innovation/scientists-are-making-cochineal-a-red-dye-from-bugs-in-the-lab-180979828/>

Okafor, M. U. (2020). Chinese colour symbolism: Its significance to the Igbo. *Authorea*, 4(1). <http://doi.org/10.22541/au.160761574.46062414/v1>

Sandberg, G. (1996). Cochineal, Madder and Murex Purple: A World Tour of Textile Techniques. In *The red dyes* (p. 34). New York: Lark Books.

Song, Y. (2021). The impact of Dunhuang murals on modern and contemporary Chinese art. *Senior Projects Spring, 2021*(107). Retrieved from https://digitalcommons.bard.edu/cgi/viewcontent.cgi?article=1244&context=sen_proj_s2021

Stocks, C. (2014). Dying in purple: Life, death, and Tyrian dye in the Aeneid. *Proceedings of the Virgil Society*, 28, 173-196.

Svensson, C. (2021, July 14). The Meaning of Different Colors in Chinese Culture [Web log post]. Retrieved from <https://www.thatsmandarin.com/guest-blogs-media/the-meaning-of-different-colors-in-chinese-culture/>

Shui, B., Yu, Z., Cui, Q., Wang, Z., Yin, Z., Sun, M., & Su, B. (2022). Blue pigments in Cave 256, Mogao Grottoes: A systematic analysis of murals and statues in Five Dynasties, Song Dynasty and Qing Dynasty. *Herit Sci*, 10, 89. doi.org/10.1186/s40494-022-00722-5

Sweeney, K. (2016, November 28). Tyrian purple [Web log post]. Retrieved from https://history1800ksweeney.wordpress.com/2016/11/28/tyrian-purple/#_ftn2

Wang, J., & Guan, C. (2022). The tenacity of culture as represented by the Chinese color term *Qing*. *Language and Semiotic Studies*, 8(4). doi.org/10.1515/lass-2022-0002

References (continued)

Xu, W., Zhang, L., Cunningham, A. B., Li, S., Zhuang, H., & Wang, Y. (2020). Blue genome: Chromosome-scale genome reveals the evolutionary and molecular basis of indigo biosynthesis in *Strobilanthes cusia*. *The Plant Journal*, 104(4), 864–879. doi.org/10.1111/tpj.14992

Yin, S. P., Niu, L., Zhang, J. C., & Liu, Y. (2024). Gardenia yellow pigment: Extraction methods, biological activities, current trends, and future prospects. *Food Research International*, 179(113981). doi.org/10.1016/j.foodres.2024.113981

Zhao, H. (2014). The Symbolic Meaning of Color 色彩的象征意义. *Youth Times 青年时代*, 11, 89–90.

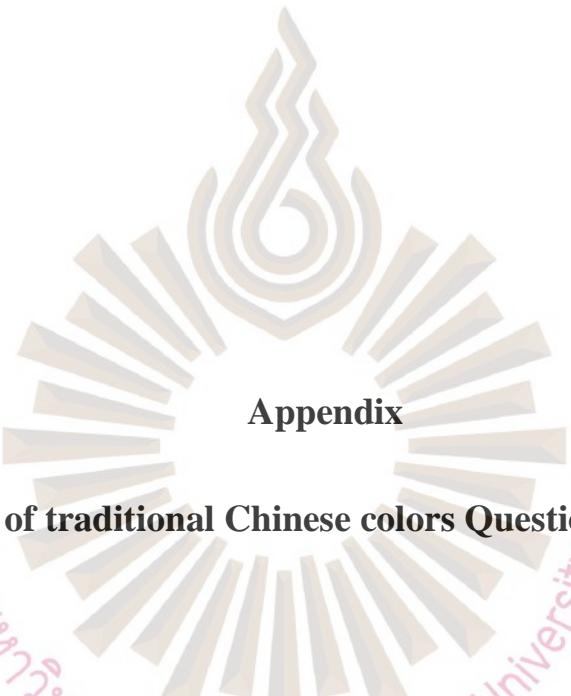
Zhao, H., & Fang, T. (2014). The dyeing experiments of *Cudrania tricuspidata* (Carr.) Bur and research. *Journal of Guangxi University for Nationalities*, 1(1). doi.org/10.16177/j.cnki.gxmzzk.2014.01.007

Zhao, S. (2020). *Ten lectures on Dunhuang art*. China: Cultural Relics Publishing House.

Zheng, J., & Lu, Y. (2011). Tyrian purple dyeing history of ancient 古代贝紫染色工艺的历史. *Art and Design*, 4, 54-57.doi.org/10.16272/j.cnki.cn11-1392/j.2011.04.002

Zhou, J., & Taylor, G. (2018). *The language of color in China*. London, England: Cambridge Scholars Publishing.

Zhou, X., Wang, Q., & Yang, X. (2009). Progresses on mechanisms of pharmacological and toxicological effects of cinnabar. *Zhongguo Zhongyao Zazhi*, 34(22), 2843–2847.



Appendix

Cognition of traditional Chinese colors Questionnaire Survey

มหาวิทยาลัยรังสิต Rangsit University

Cognition of traditional Chinese colors Questionnaire Survey

Latest update date: 2023-11-18

Total number of answers: 67

Inquirer: Zhiyao Zhou

Question 1: What is your age?

Options	Subtotal	Ratio
18 years old	7	10.45%
18-25 years old	47	70.14%
26-35 years old	11	16.41%
36-45 years old	0	0%
46 <input type="checkbox"/> years old	2	2.99%
Number of valid person times filled in	67	

Question 2: May I ask your gender?

Options	Subtotal	Ratio
Male	17	25.37%
Female	50	74.63%
Number of valid person times filled in	67	

Question 3: What is your occupation?

Options	Subtotal	Ratio
student	17	25.37 %
designer	21	31.34 %
Workers in arts related industries	15	22.38 %
People in other professions	14	20.89 %
Number of valid person times filled in	67	

Question 4 : Do you know anything about traditional Chinese colors?

Options	Subtotal	Ratio
Yes	40	59.7%
No	27	40.3%
Number of valid person times filled in	67	

Question 5: Do you know the story behind traditional Chinese colors? Like what it's made of.

Options	Subtotal	Ratio
know a lot about	5	7.46%
understand	10	14.93%
don't know much	47	70.15%
do not understand	5	7.46%
Number of valid person times filled in	67	

Question 6: Do you think the public's awareness of traditional Chinese colors is insufficient?

Options	Subtotal 1	Ratio
Yes	57	85.07%
No	3	4.48%
uncertainty	7	10.45%
Number of valid person times filled in	67	

Question 7: Do you think it is important to protect and inherit the cultural value of traditional Chinese colors?

Options	Subtotal 1	Ratio
very important	51	76.12%
importance	14	20.9%
ordinary	1	1.49%
not very important	0	0%
insignificance	1	1.49%
Number of valid person times filled in	67	

Question 8: Do you think traditional Chinese colors can produce unique cultural values in modern design?

Options	Subtotal 1	Ratio
Yes	66	98.51%
No	0	0%
uncertainty	1	1.49%
Number of valid person times filled in	67	

Question 9: Do you think the current traditional color learning resources are enough?

Options	Subtotal	Ratio
enough	10	<div style="width: 14.93%;"><div style="width: 14.93%;"></div></div> 14.93%
ordinary	28	<div style="width: 41.79%;"><div style="width: 41.79%;"></div></div> 41.79%
deficiency	29	<div style="width: 43.28%;"><div style="width: 43.28%;"></div></div> 43.28%
Number of valid person times filled in	67	



Biography

Name	Zhiyao Zhou
Date of birth	August 14, 1990
Place of birth	Jiangxi/Nanchang China
Education background	Beijing Normal University Zhuhai campus Bachelor of Arts, 2013 Rangsit University, Thailand Master of Fine Arts in Design, 2024

