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THE DESIGN AND APPLICATION OF COLORS OF SHAANXI SHADOW PUPPETRY IN TOURIST SOUVENIRS

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Abstract. This article focuses on the color system of Shaanxi shadow puppetry, analyzing its cultural connotation, design application and research status. The research uses means such as CorelDRAW software to extract the colors of shadow puppets and apply them to the design of cultural and creative products, verifying their value in evoking cultural memories and enhancing the competitiveness of products.

Purpose. This research aims to interpret the symbolic meaning, functional roles and composition logic of the color system of Shaanxi shadow puppetry, apply its cultural symbols to product design, enhance the recognition and exchange value of the art form of Shaanxi shadow puppetry, and promote the creative transformation and innovative development of intangible cultural heritage.

Methodology. By sorting out the research results covering various aspects such as the history, shapes, colors, tourism development and design applications of Shaanxi shadow puppetry, a theoretical foundation is laid for the research. Combining the application of Shaanxi shadow puppet colors in current related product designs, this paper explores the application strategies of the Shaanxi shadow puppet color system in cultural and creative products. With the help of color extraction plugins of professional software such as CorelDRAW, the colors of Shaanxi shadow puppetry were extracted and reconstructed, and applied to the design practice of cultural and creative products to verify the feasibility and effectiveness of the design strategy.

Results. This research, through theoretical analysis and design practice, has confirmed that the color system of Shaanxi shadow puppetry has great potential in the design of cultural and creative products. By applying its traditional color semantics, cultural memory can be evoked, and the narrative and emotional connection of the product can be strengthened. Dynamic and three-dimensional design can integrate aesthetics and practical functions, enhancing market competitiveness. In the future, the application of technologies such as 3D printing and VR/AR can be explored to dig deep cultural narratives. The combination of traditional symbolism and modern design is of great significance for the protection, inheritance and modern application of intangible cultural heritage, which can transform Shaanxi shadow puppetry from cultural heritage to living practice.

Scientific novelty. This study, based on an interdisciplinary research perspective, integrates theories from disciplines such as color semiotics and emotional psychology

to conduct research on the application of colors in Shaanxi shadow puppetry in the design of cultural and creative products, providing a new perspective for the study of intangible cultural heritage. It also innovates design strategies, combines three-dimensional color expression and other design strategies, breaks through traditional graphic design thinking, provides new methods for the design of cultural and creative products, and enriches the application forms of intangible cultural heritage colors in modern design.

Practical relevance. *This study integrates the colors of Shaanxi shadow puppetry into the design of cultural and creative products, which is conducive to inheriting and promoting the national intangible cultural heritage, and enables the ancient art to regain new vitality in contemporary society. It can provide reference for the design of cultural and creative products, help designers explore the color elements of traditional culture, and enhance the cultural added value and market competitiveness of products. By developing tourism souvenirs and cultural and creative products with regional characteristics, the integration of shadow puppetry and the tourism industry in Shaanxi can be promoted, and local economic development can be facilitated.*

Keywords: *graphic design, souvenir, Chinese culture, cultural heritage, 3D printing, virtual reality, Shaanxi shadow puppetry, color semantics, cultural symbol, cultural creative design.*

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INTRODUCTION

Shaanxi shadow puppetry, a national intangible cultural heritage, exhibits distinct regional characteristics between its eastern and western styles [6]. The eastern style features rigorous, delicate, and restrained craftsmanship, while the western style emphasizes bold exaggeration and simplicity. Sun L. et al. [5] believe that the redesign of intangible cultural heritage can achieve the sustainable development of intangible cultural heritage and rural areas. In the context of modern personalized demands, analyzing the color system of Shaanxi shadow puppetry and applying its cultural symbols to product design can enhance the cognitive and communicative value of this art form. This study categorizes the color system of Shaanxi shadow puppetry and validates its application through design principles and case studies.

ANALYSIS OF RECENT RESEARCH

Shaanxi shadow puppetry has a long history, dating back to the Western Han Dynasty, and reached a mature stage during the Tang and Song dynasties. In terms of geographical division, it is divided into two parts, the east and the west. The eastern shadow puppetry is represented by places like Hua County, with simple and strict shapes, reserved decoration and delicate engraving. Western shadow puppets are distributed from the west of Xianyang County to Baoji and Long counties. They have exaggerated shapes, strong decorative effects,

and rough yet simple carvings [17]. With its unique shapes and carving techniques, Shaanxi shadow puppetry has become an outstanding representative of Chinese shadow puppetry art and can be regarded as a cultural treasure of the Chinese nation. In terms of design features, it uses the skin of Qinchuan yellow cowhide as raw material, use the techniques of negative carving and relief carving, and combines the "pushing the skin and moving the knife" technique to ensure meticulous carving. The pattern design mainly features hollowed-out patterns, with a balance of simplicity and complexity, drawing on the planar composition and decorative symbols of drama. The color combination is based on red and green, blended with black. It is rendered through split-color flat coating, and combined with the natural color of cowhide (yellow) and hollowed-out blank space (white) to present five colors, showcasing a harmonious beauty. In addition, as a folk art, Shaanxi shadow puppetry incorporates numerous folk patterns, covering categories such as animals, figures, plants and geometric symbols, and has unique implications. It not only carries rich cultural connotations but also has extremely high artistic value [12].

Gao Honghe and O. Yezhova [1] found that the integration of Chinese theatrical art into souvenir design requires a clear set of principles that bridge tradition and innovation, especially through case studies such as shadow puppetry and Sichuan Opera. O. Yezhova et al. [7] revealed that ethnic Chinese design motifs, including

lighting aesthetics, significantly influence spatial perception and emotional resonance in public interiors, offering useful parallels for sensory experience design in cultural souvenirs. Gao Honghe and O. Yezhova [2] found that virtual reality technologies enhance the expressiveness, educational value, and audience reach of shadow puppetry, suggesting possibilities for digital-physical hybrid souvenir experiences.

O. Yezhova, J. Zhao and K. Pashkevich [8] identified immersive technologies, including VR and interactive web design, as central to enhancing engagement with cultural heritage in online museums, pointing to broader strategies for digitized cultural storytelling. I. Gryshchenko et al. [4] showed that cross-cultural educational programs in design foster interdisciplinary thinking and technological fluency, which are necessary for designing culturally informed and technologically enriched souvenir products.

The cultural genes and visual symbol Construction of Shaanxi Shadow Puppetry colors

Gao Xia and O. Yezhova [3] demonstrated that understanding totemic symbols and traditional Chinese patterns is essential for integrating cultural identity into modern design practices such as fashion, which may also inform souvenir aesthetics. The color system of Shaanxi shadow puppetry is the explicit carrier of regional culture, and its formation and evolution run through the historical context and the context of folk culture. During its development process, it was successively influenced by primitive witchcraft, religious culture and folk culture, and gradually established a color system that follows the traditional concept of the Five Elements and Five colors. Each color is endowed with symbolic meaning: red corresponds to the fire of the Five Elements, symbolizing loyalty and bravery; Yellow corresponds to Earth in the Five Elements theory, symbolizing solemnity. Green corresponds to the wood element in the Five Elements theory, representing heroes or ghosts. Black corresponds to water in the Five Elements, symbolizing uprightness and integrity. White corresponds to the metal element, symbolizing insidiousness, treachery and shamelessness, but in certain contexts white is also used to express qualities such as purity and kindness. Meanwhile, with the passage of time, the colors of Shaanxi shadow puppetry have evolved from single colors to multi-solid color combinations and then to contemporary stepless vector complex colors. This transformation has greatly enhanced the expressiveness of shadow puppetry art [13]. As a unique artistic language, its color symbols

not only carry rich cultural connotations but also become important visual symbols for identifying regional cultures.

Modern translation and symbol regeneration of traditional colors. Shaanxi shadow puppetry has a profound heritage and a significant advantage in integrating with the tourism industry. Scholar Bai Dihua, in response to the current situation and problems of its cultural tourism development, proposed targeted strategies to promote the in-depth integration of shadow puppet culture and the tourism industry [9]. In the field of modern design applications, many scholars are dedicated to the modern translation of shadow puppet colors. In the packaging design of "Xingping Apples", Zhang Jing used the signature red color of shadow puppetry as the main tone, integrating black hollowed-out patterns. By leveraging the simple texture of paper materials, she recreated the rich and profound charm of traditional coloring. It not only retains the cultural symbolic meaning of "Auspicious red", but also conforms to contemporary aesthetics through the blank space technique of modern design, making the packaging both have the characteristics of regional intangible cultural heritage and a sense of fashion [19]. Jin Hua incorporated the classic color scheme of "black face and colorful body" from Shaanxi shadow puppetry into the design of shoes and boots. By using laser engraving technology, it presented red and green contrast patterns on the sheepskin fabric. Through the analysis and extraction of color elements, the reconstruction of color ratios, and the adjustment of saturation and hue, it infused the cultural implications of shadow puppet colors into modern leather products. To ensure the continuation and innovation of traditional aesthetics in practical design [11].

The integration of emotional design and color narrative. Emotional design theory can provide a cognitive framework for color application. Shi Junchuan pointed out that when cultural and creative products require emotional design and expression, and color has a direct impact on the overall effect of the design [14]. For instance, the red color in shadow puppetry can evoke emotional memories of "joy" and "auspiciousness". The combination of black and green is likely to evoke a sense of mystery and history, making it suitable for carriers such as archaeological blind boxes and cultural and museum derivatives. Wang Feifei believes that the design and development of cultural and creative products need to build a story through elements such as color, shape

and material to achieve emotional guidance for users. Warm colors can create a cozy and vibrant atmosphere, while cool tones bring a sense of tranquility and contemplation. By ingeniously applying the colors and symbolic meanings of Shaanxi shadow puppetry, rich emotional connotations can be infused into cultural and creative products, making them carriers for emotional transmission and evoking emotional resonance among the audience [16], ultimately achieving the design goal of "color narrative".

Research Status and Challenges. In the new design era characterized by a globalized market and localized marketing, integrating traditional culture into design to ensure the differentiation of local creative sources on a global scale has become increasingly important [10]. Existing studies have explored from dimensions such as color semiotics and emotional psychology, but there are still certain limitations:

Research on color adaptation in cross-cultural communication is insufficient: Zhang Wei emphasizes that the transformation of intangible cultural heritage elements needs to be combined with regional consumption psychology [20], but the analysis of the acceptance of colors in Shaanxi shadow puppetry by tourists from other places is still lacking. For instance, the symbolic differences of green in different cultures may affect the design strategies of souvenirs.

Tang Jingwen et al. found through structural equation models that aesthetic value is an important driver of consumer willingness. However, there is still a lack of systematic research on how to balance functionality (such as dirt resistance and easy recognizability) and cultural expression in practical souvenirs (such as stationery and daily necessities) [15].

Although scholars such as Yang Xia proposed the concept of "five-sense design", for the symbolic cognition and preferences of consumer groups towards shadow puppet colors, it is still necessary to deepen empirical analysis by combining methods such as eye movement experiments and questionnaire surveys [18].

PURPOSE

This research aims to interpret the symbolic meaning, functional roles and composition logic of the color system of Shaanxi shadow puppetry, apply its cultural symbols to product design, enhance the recognition and exchange value of the art form of Shaanxi shadow puppetry, and promote the creative transformation and innovative development of intangible cultural heritage.

This study completed the following tasks:

- analyzing the color emotional mapping of the audience group through quantitative research;

- exploring the innovative application of color in tourist souvenirs;

- promoting the transformation of the color of Shaanxi shadow puppetry from a traditional craftsmanship symbol to a modern cultural consumption symbol.

RESULTS AND DISCUSSION

The Cultural Origin of the Color System of Shaanxi Shadow Puppetry

Shaanxi shadow puppetry, as a national intangible cultural heritage, its color system carries profound cultural connotations. As shown in Figure 1, the use of colors in Shaanxi shadow puppetry figures is not arbitrary but is rooted in traditional Chinese philosophical thoughts and folk aesthetic concepts. During its long-term development, a color system based on the "Five Elements and Five Colors" theory has gradually taken shape. Through the ingenious combination of the five basic colors – red, yellow, green, black and white – a unique visual language system has been constructed.

By analyzing the shapes and colors of the typical Shaanxi shadow puppetry in Figure 2, it can be known that each of these five colors carries rich symbolic meanings. For instance, red symbolizes loyalty, bravery, auspiciousness and joy in traditional Chinese culture, and is often used to represent the personality traits of positive people. White symbolizes betrayal and treachery, and is often used to create villainous characters. In certain situations, it also implies purity and kindness. Green is often used to depict natural scenery and can also represent wild heroes. Black represents uprightness and integrity, and is often used to depict characters with an unyielding spirit. Yellow symbolizes nobility and splendor and is usually used to represent emperors, generals and ministers. These color symbols not only outline the distinct characters but also convey the wisdom of traditional Chinese philosophy.

Translation strategies for the design of colors in Shaanxi Shadow puppetry

Color extraction and reconstruction.

In the process of modern design transformation, this study uses professional design software such as CorelDRAW to scientifically extract the colors of Shaanxi shadow puppetry images, as shown in Figure 3. Through the analysis of numerous classic samples of Shaanxi shadow puppets, five of the most representative colors, namely red, yellow, green, white and black,

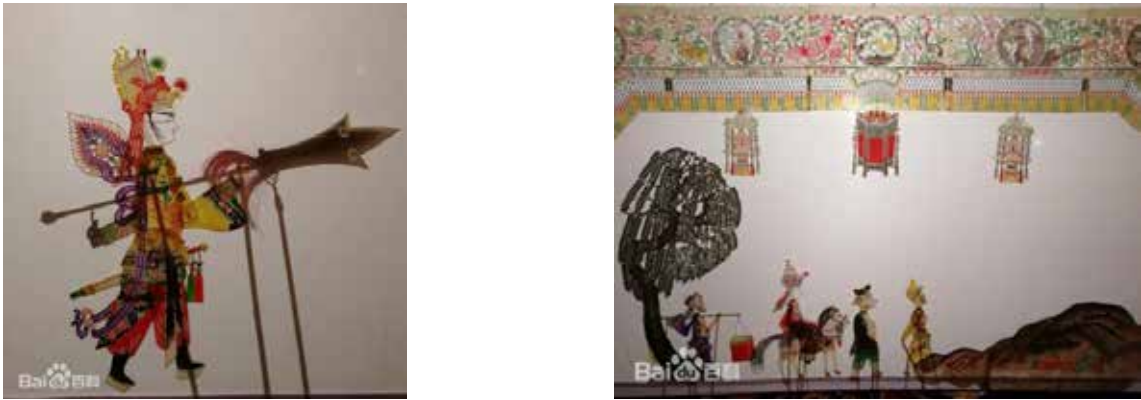


Fig. 1. Typical Shaanxi shadow puppetry characters
(Source: <https://baike.baidu.com/item/%E9%AD%8F%E9%87%91%E5%85%A8/5231805>)



Fig. 2. Shadow Puppetry of East Shaanxi Province – The Dragon King Goes to the Sea (The Aquatic Honor Guard, Qing Dynasty) (Source: <https://finance.sina.com.cn/jjxw/2024-03-12/doc-inamzwir0639124.shtml>)

Table 1

The Five Elements and Five Colors System of Shaanxi Shadow Puppetry (Gao T., 2025)

Category	Color	Color Name	Symbolism
Core primary		Vermilion Red	Loyalty, celebration
		Ink Black	Authority, contouring
		Yellow	Divinity, nobility
Narrative auxiliary		Green	Vitality, nature
		White	Disloyalty

were selected as the characteristic color series (the difference in color depth within the same color series is mostly caused by the effect of dye

diffusion during the making of shadow puppets). On this basis, combined with modern aesthetic demands, the colors are appropriately adjusted



Fig. 3. Color extraction process of shadow puppetry (Source: Gao Honghe & Lin Zedong T., 2025)

and reconstructed so that they can not only retain the traditional charm but also conform to the contemporary design context.

The design style of the main and auxiliary color combination

Setting the tone with large areas of main colors: In the design of cultural and creative products, the reasonable use of large areas of main colors can effectively create an overall atmosphere. Take the design of a mobile phone case as an example. If red is chosen as the main color tone, it can instantly infuse the product with a warm and lively atmosphere, fully convey the passionate and unrestrained cultural characteristics of Shaanxi shadow puppetry, and make it the visual focus. When yellow is used as the main color, it can create an elegant and grand style, which is in line with the color expression of noble status in shadow puppetry art, and is especially suitable for product design that pursues high-end texture.

Small area auxiliary color embellishment: To avoid the main color being too monotonous, it is necessary to use small areas of auxiliary colors for decoration. Green, blue and other colors are usually used as accent colors, with

their proportion controlled at around 10% to 15%. For instance, on a phone case with red as the main color tone, adding green shadow puppet-style patterns along the edges or in the gaps of the patterns can not only enhance a fresh and natural atmosphere but also make the overall color scheme more harmonious, while highlighting the detailed beauty of shadow puppet-style art. In addition, the small-scale application of special colors such as purple can add unique charm to the product and meet the aesthetic needs of different consumers, as shown in Figure 4.

Three-dimensional color expression

Enhancing the three-dimensional effect: By using innovative design techniques to transform the flat shadow puppet elements into three-dimensional forms, the spatial sense and visual appeal of the product can be significantly enhanced. For instance, in the design of mobile phone cases, the shadow puppet image is made of plastic into a three-dimensional shape and placed inside a protective cover. Through ingenious structural design, the limbs and other parts of the shadow puppet can move. When the user shakes the phone, the shadow



Fig. 4. Mobile phone case design with color dominance and interactive elements (Source: Gao Honghe & Lin Zedong T., 2025)

puppet will dance gracefully. This dynamic effect not only deepens the user's perception of the three-dimensional effect of shadow puppet art, but also greatly enhances the fun of the product.

Enhance interactivity: For instance, in the design of children's shadow puppet coloring sets, fully draw on the visual effect of multi-layer superimposition in shadow puppet performances and adopt the method of color area division. First, print a layer of light gray basic pattern

scene. Some characters are pre-colored, while others are left blank. Children can create based on existing color examples. This design not only reduces the difficulty of creation but also provides ample space for creativity, effectively enhancing the sense of participation and interactivity of the products. During the coloring process, children not only exercised their hands-on ability but also directly experienced the unique charm of the colors of Shaanxi shadow puppetry, as shown in Figure 5.



Fig. 5. 3D puppet and children's coloring book applications.
(Source: Gao Honghe & Lin Zedong T., 2025)

CONCLUSIONS

This study, through theoretical analysis and design practice, fully demonstrates the great potential of the color system of Shaanxi shadow puppetry in the design of cultural and creative products. The main research achievements include:

Firstly, the application of traditional color semantics can effectively evoke consumers' cultural memories, enhance the narrative and emotional connection of products, and make cultural and creative products an important carrier for conveying traditional culture.

Secondly, through dynamic and three-dimensional design forms, the organic unity of aesthetic value and practical functions has been achieved, enhancing the market competitiveness of cultural and creative products.

Thirdly, future research can further explore the application of cutting-edge technologies such as 3D printing and VR/AR in shadow puppet cultural and creative design, while delving into deeper cultural narratives and expanding the boundaries of design applications.

Combining traditional symbolism with modern design not only helps the ancient art form of Shaanxi shadow puppetry to rejuvenate

in contemporary society, but also promotes the creative transformation and innovative development of intangible cultural heritage, making it an important bridge connecting tradition and modernity. This exploration holds significant theoretical value and practical significance for the protection, inheritance and modern application of intangible cultural heritage. Shaanxi shadow puppetry is expected to achieve a transformation from cultural heritage to living cultural practice through this, and regain new vitality in contemporary society.

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АНОТАЦІЯ

Гао Хунхе, Єжова О. Дизайн та застосування кольорів лялькового театру тіней Шеньсі в туристичних сувенірах

Дослідження зосереджено на кольоровій системі тіньового лялькового театру Шеньсі з аналізом її культурної конотації, застосування в дизайні та стану дослідження. У статті використовуються такі засоби, як програмне забезпечення CorelDRAW, для вилучення кольорів тіньових ляльок та їх застосування в дизайні культурних і креативних продуктів, перевірки їх цінності в пробудженні культурних спогадів та підвищенні конкурентоспроможності продуктів.

Мета. Дослідження спрямовано на інтерпретацію символічного значення, функціональних ролей та логіки композиції кольорової системи тіньового лялькового театру Шеньсі, застосування його культурних символів до дизайну продуктів, підвищення впізнаваності та обмінної цінності художньої форми театру, а також сприяння творчій трансформації та інноваційному розвитку нематеріальної культурної спадщини.

Методологія. Шляхом сортування результатів розвідки, що охоплюють такі різні аспекти, як історія, форми, кольори, розвиток туризму та застосування в дизайні тіньового лялькового театру Шеньсі, закладено теоретичну основу для дослідження. Поєднуючи застосування кольорів тіньових ляльок Шеньсі в сучасному дизайні пов'язаних продуктів, у роботі досліджено стратегії застосування кольорової системи тіньових ляльок Шеньсі в культурних і креативних продуктах. За допомогою плагінів для вилучення кольорів професійного програмного забезпечення, такого як CorelDRAW, кольори тіньового лялькового театру Шеньсі було вилучено та реконструйовано, а потім застосовано до дизайнерської практики культурних та креативних продуктів для перевірки доцільності й ефективності дизайнерської стратегії.

Результати. У результаті дослідження, проведеного за допомогою теоретичного аналізу та дизайнерської практики, підтверджено, що колірна система тіньового лялькового театру Шеньсі має великий потенціал у дизайні культурних та креативних продуктів. Застосовуючи її традиційну кольорову семантику, можна пробудити культурну пам'ять, а також посилити наративний та емоційний зв'язок продукту. Динамічний та тривимірний дизайн може інтегрувати естетику та практичні функції, підвищуючи конкурентоспроможність на ринку. У майбутньому можна дослідити застосування таких технологій, як 3D-друк та VR/AR, для глибокого вивчення культурних наративів. Поєднання традиційної символіки та сучасного дизайну має велике значення для захисту, успадкування та сучасного застосування нематеріальної культурної спадщини, що може перетворити тіньовий ляльковий театр Шеньсі з культурної спадщини на живу практику.

Наукова новизна. У дослідженні, заснованому на міждисциплінарній дослідницькій перспективі, інтегровано теорії з таких дисциплін, як кольорова семіотика та емоційна психологія, для проведення дослідження застосування

кольорів у тіньовому ляльковому театрі Шеньсі в дизайні культурних та креативних продуктів, і запропоновано нову перспективу для вивчення нематеріальної культурної спадщини. У ньому також впроваджено інноваційні дизайнерські стратегії, поєднано тривимірне кольорове вираження та інші дизайнерські стратегії, розширено межі традиційного мислення графічного дизайну, запропоновано нові методи дизайну культурних та креативних продуктів і збагачено форми застосування кольорів нематеріальної культурної спадщини в сучасному дизайні.

Практична значущість. У дослідженні інтегровано кольори тіньового лялькового театру Шеньсі в дизайн культурних та креативних продуктів, що сприяє успадкуванню і просуванню національної нематеріальної культурної спадщини й дозволяє стародавньому мистецтву відновити нову життєву силу в сучасному суспільстві. Воно може служити орієнтиром для дизайну культурних та креативних продуктів, допомогти дизайнерам дослідити колірні елементи традиційної культури та підвищити культурну додану цінність і конкурентоспроможність продуктів на ринку. Розробляючи туристичні сувеніри та культурні й креативні продукти з регіональними особливостями, можна сприяти інтеграції тіньового лялькового театру й туристичної галузі в Шеньсі, а також сприяти місцевому економічному розвитку.

Ключові слова: графічний дизайн, сувенір, китайська культура, культурна спадщина, 3D-друк, віртуальна реальність, тіньовий ляльковий театр Шеньсі, колірна семантика, культурний символ, культурний креативний дизайн.

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