



Exploration of Cultural Products Based on Design Semiotics: A Case Study of Traditional Yugu Clothing Patterns

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Abstract. As one of the ethnic minorities located in the "Hexi Corridor" in North-west China, the Yugu people's traditional clothing patterns not only possess distinctive ethnic characteristics and aesthetic appeal but also embody rich cultural connotations and social symbolic meanings. This paper focuses on the traditional clothing patterns of the Yugu ethnic group and explores the application of design semiotics theory in modern fashion design. The study employs design semiotic methods to analyze the traditional Yugu clothing patterns and develops an analytical framework. The research is conducted from three dimensions: denotation and connotation, structural elements and composition rules, and aesthetic concepts and consumer environment, thereby endowing the patterns with deeper cultural value. Additionally, a semiotic model is constructed for the expression of Yugu traditional clothing patterns, clarifying their surface features, deep structures, and cultural implications. In the practical phase, field investigations and literature analysis were used to objectively demonstrate the advantages of applying design semiotics in the modernization of Yugu traditional clothing patterns. This study contributes to a broader understanding and preservation of minority cultures, protecting their unique art forms and traditional craftsmanship.

Keywords: Design Semiotics; Traditional Yugu Clothing Patterns; Semiotic Elements; Cultural Heritage

1 Introduction

As an intangible cultural heritage, Yugu clothing possesses unique regional cultural characteristics and artistic value. When exploring the factors influencing the development of ethnic groups, the cultural and artistic value of clothing is often regarded as one of the key reference elements. As an important carrier of ethnic culture, minority clothing not only reflects a group's history, beliefs, and aesthetic concepts, but also, to a certain extent, mirrors its social structure and economic development level.^[1] The patterns found in Yugu clothing are not only symbols of ethnic cultural identity but also significant witnesses to the ethnic group's history and social transformations. Through

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the study of Yugu clothing patterns, this paper aims to explore their crucial role in the development of the Yugu people. See Figure 1.

The history of the Yugu people is reflected in their clothing patterns, which embody methods of cultural transmission and the trajectory of cultural prosperity and decline. The design elements--colors, patterns, and materials--are closely connected to their natural environment, religious beliefs, and social customs. Yugu history, art, culture, social activities, and industries are interwoven into a unique cultural system.

As a national intangible cultural heritage, Yugu traditional clothing patterns carry both distinctive ethnic characteristics and rich cultural and artistic value. Despite facing harsh natural conditions, the Yugu people have endured. With the rise of cultural confidence in modern China, opportunities for the value of Yugu clothing patterns have emerged. However, the challenge remains in conveying the cultural essence, preserving its purity, and integrating it with modern life.



Fig. 1. Yugu Clothing (Image source: Visual China).

This paper, using design semiotics, explores the systematic application and transformation of design semiotics in Yugu clothing pattern design and considers new approaches in cultural dissemination.

2 Yugu Clothing Patterns and Design Semiotics

2.1 The Intersection of Yugu Clothing Patterns and Modern Cultural Products.

The cultural evolution of the Yugu people reflects a complex history of ethnic interaction and integration. Documented since the Tang Dynasty, the Yugu were originally nomadic in the Orkhon River Basin before migrating to the Hexi Corridor. Formed in the 15th century through the integration of Uyghurs, Mongols, Tibetans, and Han Chinese, Yugu cultural traits are most evident in their unique clothing patterns, preserving the heritage of ancient nomadic peoples. These patterns, as part of China's intangible

cultural heritage, serve as both artistic expressions^[2] and cultural memory, offering insights into Yugu social structure, religion, and aesthetics. Studying these patterns reveals their cultural evolution and supports the preservation of Yugu culture.

A systematic study of these patterns uncovers their evolution across historical periods and their interactions with surrounding cultures.

2.2 Limitations in the Cultural Dissemination of Yugu Clothing Patterns

In the evolving cultural industry, Yugu clothing patterns have garnered significant scholarly attention across history, sociology, ethnology, and the arts. However, theoretical studies on design methods remain limited, posing several challenges. First, there is no comprehensive system for creative development, with a focus on commercial and functional aspects at the expense of cultural significance. Second, the absence of a systematic approach to extracting cultural symbols has misaligned designs with core Yugu culture. Third, despite the diversity of Yugu patterns, current designs are often superficial and homogenized, lacking cultural depth. Lastly, user perception is overlooked, leading to a focus on aesthetics rather than deeper cultural meanings, resulting in misconceptions.

The issues stem from insufficient theoretical guidance, weak cultural awareness, and poor user consideration, which hinder effective cultural dissemination and the accurate transmission of Yugu values^[3]. As shown in Figure 2, the structure of the Design Semiotics system highlights the interplay between design semantics, syntax, and pragmatics, focusing on the meaning, composition, and users of the symbol. This system demonstrates the essential role of social behavior and psychology in understanding how symbols function and are perceived, further emphasizing the need for a comprehensive approach to symbol design that bridges cultural meaning with user experience.

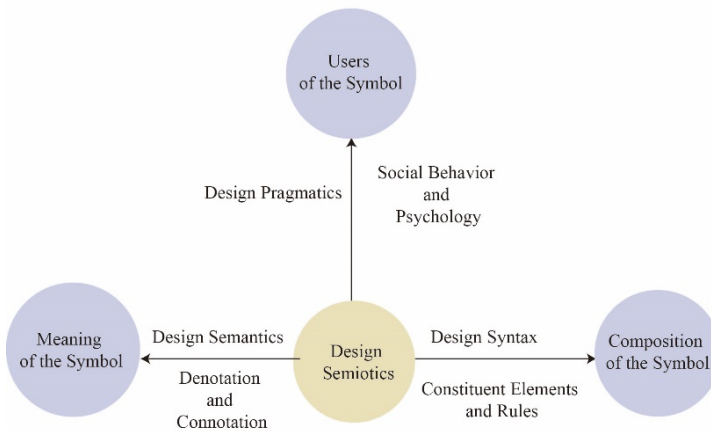


Fig. 2. Structure of the Design Semiotics System (Image source: Drawn by the author).

2.3 "Three Dimensions" as the Core of Design Semiotics

In the early 20th century, Swiss linguist Ferdinand de Saussure introduced linguistic semiotics, highlighting the arbitrary nature of signs, consisting of the "signifier" and "signified." This theory revealed the interplay between language and culture. Jappy sets out by suggesting that visual semiotics is concerned with the study of visual culture, a culture that has witnessed enormous growth in the devising and deployment of vision-based technology^[4] and in which information is deserting the traditional print media and is coming more and more to be framed in screens of various sorts".

However, in contrast to this immense research field, the field of study presented in Jappy's introduction is much narrower and more traditional in its scope. Among the examples by means of which the author introduces visual semiotics to his readers are drawings, engravings, block prints, frescoes, paintings, photo-graphs, posters, diagrams, maps, and emoticons. He also includes nonverbal communication^[5] within his range of topics and incorporates thus within visual semiotics a field of study that established itself as an independent field of semiotic research many decades ago.

In 1992, Xu Hengchun translated Marx Benzer's semiotic theory, *General Semiotics and Its Application in Design*, which was a major academic contribution. In recent years, design semiotics has gained prominence in modern design, widely applied in fields like art, industry, advertising, and language, enhancing design theory and fostering development in related areas.

3 Semiotic Construction of the Design Methods for Cultural Products Based on Yugu Clothing Patterns

3.1 Semiotic Analysis Framework of Yugu Clothing Pattern Design

According to Morris's semiotic theory, all designed products unify the signifier and signified across three dimensions: semantics, syntax, and pragmatics. Yugu clothing patterns are analyzed through these dimensions (Figure 3). Semantics covers both denotation, focusing on function, material, and color, and connotation, revealing cultural and social values. Syntax examines compositional elements^[5] and their relationships, such as color choices and pattern rules. Yugu patterns display diverse colors, materials, and weaving techniques, rooted in their cultural system. Designers must understand these relationships to integrate Yugu patterns into modern design, enhancing both scientific precision and cultural significance.

Pragmatics focuses on exploring the interaction between products and users. The pragmatic dimension encompasses not only the functionality and suitability of the product but also takes into account users' cognitive habits, cultural backgrounds, and aesthetic preferences. This highlights the importance of studying the usage methods and application contexts of Yugu clothing patterns throughout historical periods.

A thorough understanding of the original intent behind clothing pattern design^[5] and the characteristics of modern users is essential. This involves exploring the relationship between the cultural meaning of clothing patterns and users' lives, work, consumption habits, and usage environments. These considerations include the application scenarios,

natural environment, market environment, and social environment in which the clothing patterns are used.

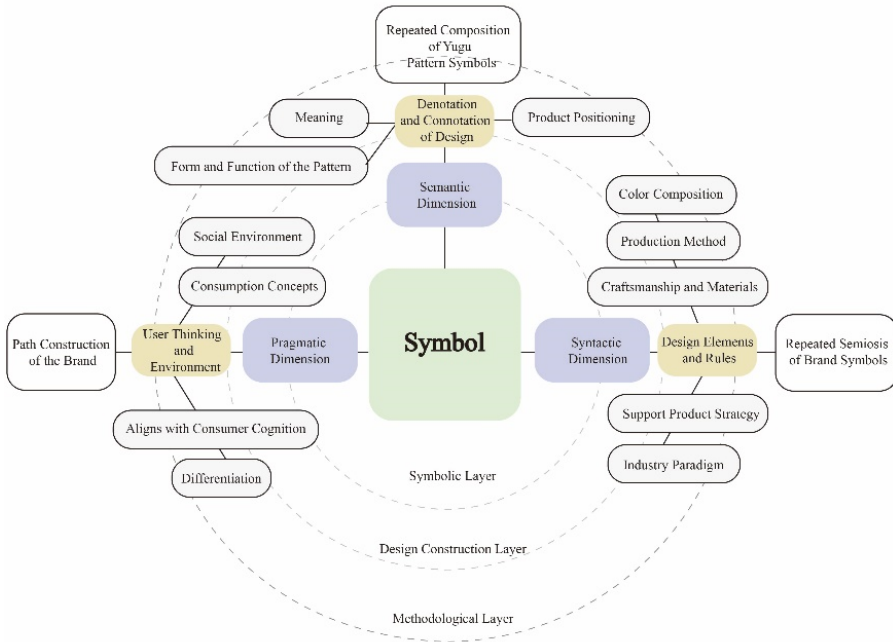


Fig. 3. Semiotic Analysis Framework for the Design of Yugu Clothing Patterns (Image source: Drawn by the author).

3.2 Cultural Information Transmission Based on Semantic Methodology

The presentation of clothing patterns, as a product of design, is not merely a simple integration of shapes, material textures, and pattern arrangements. Rather, it operates as a symbol with dual signification, embodying both the "signifier"^[6] and the "signified" When designing any product, it is essential to first identify the target users and create a user model. The same applies when using semiotics in design; a user semantic⁴ model must be established first. The "signifier"^[6] of clothing pattern symbols refers to their external characteristics--namely, the visual features of the designed product. At the same time, the "signified" refers to the specific content of the symbol, which represents the concepts and basic perceptions that people associate with the clothing patterns.

Yugu clothing patterns are not only practical but also serve as significant cultural symbols. By applying design semiotics and examining their syntactic elements and composition rules, we can better understand their cultural and artistic value.

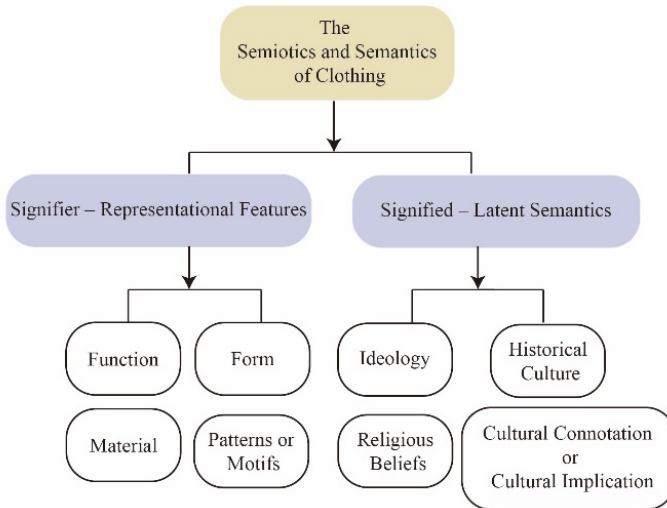


Fig. 4. illustrates the relationship between the "signifier" and the "signified" in clothing pattern symbols (Image source: Drawn by the author).

Key design elements include structural proportions and dyeing/weaving techniques. The proportions of hats, tops, belts, skirts, or pants affect both comfort and aesthetics. For instance, the height and width of a hat symbolize social status, while the balance between tops and skirts or pants reflects both beauty and practicality.

As shown in Figure 4, the Yugu people excel in using natural dyes and unique dyeing and weaving techniques to create vibrant, soft fabrics. These methods showcase their craftsmanship and respect for nature. Traditional techniques like tie-dyeing and embroidery not only decorate but also impart symbolic meanings and protective functions to the clothing patterns.

Yugu clothing patterns follow set composition rules, with color and pattern arrangements reflecting deep cultural meanings and rich visual effects. Colors like red, yellow, and blue are symbolic, representing auspiciousness, nobility, and reverence for nature. These colors are skillfully combined through contrast and brightness variations to create harmonious designs. Patterns are arranged following specific layouts, forming a unified and rhythmic decorative style. Notably, these patterns are traditionally created by indigenous working women rather than experts or scholars^[7].

In design semiotics, the study of syntax mainly explores the constituent elements of morphological symbols and the rules governing their composition. This involves deconstructing elements such as the materials constituting the shapes, the materials used in products, and organizational structures from a compositional perspective. This also tests the designer's understanding of the existing rules in the colors and patterns of clothing designs. In terms of color composition and pattern forms, Yugu clothing patterns follow specific compositional rules that not only enhance visual appeal but also imbue the designs with deep symbolic meaning. As shown in Figure 5, a Yugu artisan

is demonstrating the sewing process, carefully selecting colors and patterns to create a harmonious balance between aesthetics and cultural significance.



Fig. 5. Weaving Techniques of Yugu Clothing Patterns (Image source: China Intangible Cultural Heritage Network).

3.3 National Connotations and Aesthetic Cognition Based on Pragmatic Methodology

Yugu clothing patterns are not only practical daily items for the Yugu people but also important carriers showcasing their culture and aesthetics. By combining the theory of design semiotics and exploring the aesthetic environment and cognitive aspects of Yugu clothing patterns from a pragmatic perspective, we can more comprehensively understand their cultural connotations and social value.

Through the analysis using the pragmatic model framework, as shown in Figure 6, we can draw the following conclusions. The aesthetic environment includes the social environment and consumption concepts. The design of Yugu clothing patterns is deeply influenced by the social environment in which they are situated. As a people that integrates the cultural backgrounds of Uyghurs, Mongols, Tibetans, Uighurs, and Han Chinese, the Yugu people have developed a unique style of clothing patterns throughout their long historical development. These patterns not only reflect their way of life and social structure but also embody their respect and reverence for nature and tradition. In modern society, with the shift in consumption concepts, Yugu clothing patterns continue to evolve and innovate. The growing appreciation of traditional culture and the recognition of ethnic uniqueness have given Yugu clothing patterns new vitality in the contemporary market, making them a fashionable choice that embodies cultural depth and aligns with modern aesthetics.

Aesthetic cognition in Yugu culture is shaped by Shamanism and Buddhism, with beliefs in animism and auspicious symbols reflected in clothing patterns. Motifs like clouds, scroll grass, and divine sheep symbolize prayers for protection and harmony with nature, while Buddhist symbols such as the conch, Dharma wheel, and lotus represent good fortune. Yugu mythology, especially the "Swan Zither,"^[8] influences

cultural expression through swan patterns. Floral and ram's horn motifs serve as artistic and symbolic elements, offering insights into Yugu social structure, religion, and aesthetics, making these patterns key carriers of cultural transmission.

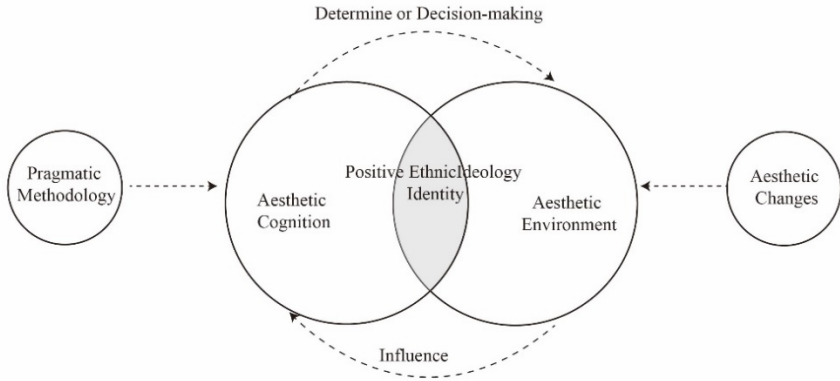


Fig. 6. Pragmatic Model Framework of Yugu Culture (Image source: Drawn by the author).

4 The Expression and Application of Cultural Product Design Based on Yugu Clothing Patterns

4.1 Symbolic Meaning Transformation

Symbols possess the inherent characteristic of conveying and expressing meaning; their essence lies in interpreting meaning to the external world, forming an information dissemination process mediated by symbols. Thus, cultural symbols serve as crucial instruments for transmitting cultural information and eliciting resonance among audiences. Based on literature research and fieldwork, it has been determined that the symbolic structure of Yugu clothing patterns comprises three components: representational features, symbolic meaning, and symbolic interpretation. The representational features refer to the visual, auditory, and tactile characteristics of the form, which allow individuals to directly perceive the surface meaning the symbol aims to communicate. These features are intended to express the core cultural ideology [9].

As shown in Figure 7, "Extraction of Clothing Elements," the process highlights how traditional Yugu patterns are carefully extracted and adapted to modern design while preserving cultural authenticity. The figure outlines the method used to analyze and transform Yugu clothing motifs, transitioning from traditional forms to contemporary applications. This process ensures the cultural and aesthetic integrity of Yugu patterns remains intact, while making them relevant in modern contexts, thus bridging tradition with modernity and fostering greater appreciation of Yugu heritage.



Fig. 7. Extraction of Clothing Elements (Image source: Drawn by the author).

Symbolic interpretation refers to the relationship between the creator and the user, requiring designers to consider aesthetic preferences and social context. Designers must ensure the symbol is effectively communicated by accounting for various possibilities. When designing the patterns of Yugu clothing, the choice of colors, materials, and motifs influences the users' preferences and perceptions [10]. Therefore, the design must take into account the aesthetic preferences of the contemporary audience and societal trends. If the design deviates too far from the target audience, the symbolic transmission may fail to resonate and lose its relevance.

4.2 Background Research on Cultural Creative Products

In designing cultural products based on Yugu clothing patterns, two-way interaction, consensus, and media-friendly symbols form the core of cultural communication. Designers and users co-create and transmit cultural information through interaction, while consensus on cultural principles fosters emotional resonance and cultural identity. Media-friendly symbols further ensure easy understanding and dissemination of cultural elements to a wider audience. These elements provide strong theoretical and practical support for promoting Yugu culture, as shown by the data analysis in Figure 8.

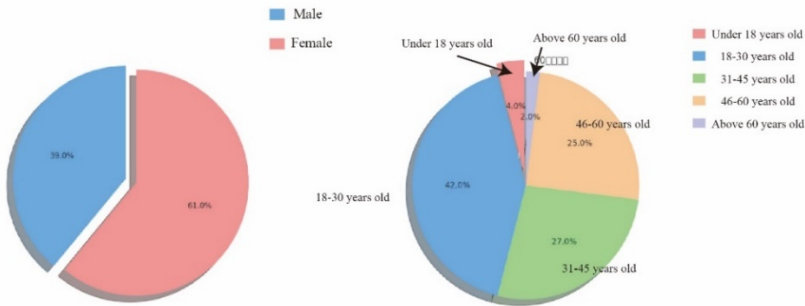


Fig. 8. Primary Audience for Cultural Products Featuring Yugu Patterns (mage source: Drawn by the author).

A survey conducted in Su'nan Yugu Autonomous County, with 356 questionnaires and 321 valid responses, revealed that the primary audience for Yugu cultural products is the 18–45 age group. Additionally, interviews with 11 key users offered deeper insights into their experiences with Yugu clothing patterns.

4.3 Scheme Deduction

In 1972, MIT professor George Stiny introduced Shape Grammar, a method for designing geometric shapes. It generates new forms from an initial shape by applying a set of rules and deduction steps while preserving continuity. The method views shapes as holistic entities composed of geometric elements and spatial relationships. Deduction rules involve operations like adding, removing, or transforming elements, while spatial constraints maintain configurations. These rules not only guide technical specifications but also integrate cultural and aesthetic meanings into the design^[11].

In practical application, Shape Grammar is used to deduce patterns from Yugu clothing. By applying the generative rules of Shape Grammar, a series of shape operations and transformations can be performed on traditional Yugu clothing patterns, leading to the derivation of new pattern designs. This paper applies the generative rules of Shape Grammar to deduce Yugu clothing patterns and derive new pattern designs.

The evolution of the unique "flower pattern" of the Yugu people begins with Figure 9. First, execute step A2 once to remove lines detracting from aesthetics. Then, perform E2 to vertically flip and mirror the image, followed by E1 to horizontally flip and apply a secondary mirroring process per the algorithm.

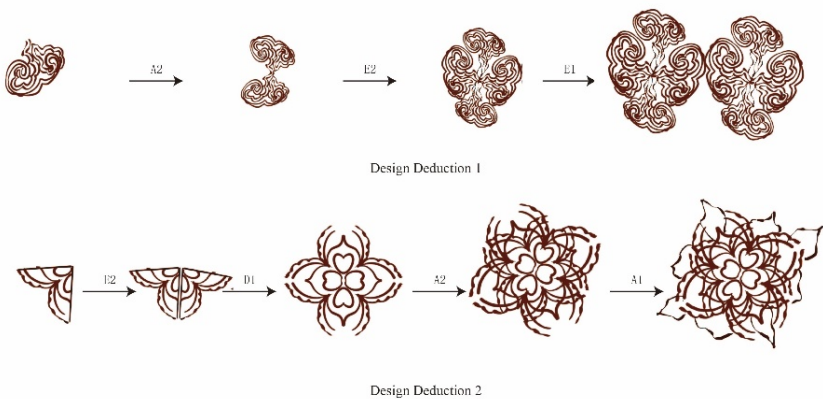


Fig. 9. Pattern Deduction (Image source: Drawn by the author)

The second experiment begins with the "divine sheep pattern" (Figure 9). First, execute E2 for vertical flipping and mirroring. Next, perform D1 twice, rotating the pattern 45° clockwise for multi-angle integration. Then, execute A2 to simplify the design by removing excess details, and finally, A1 to add lines fitting Yugu patterns. The final Series 2 pattern enhances the original structure with added elements, yielding a more

refined design, preserving the divine sheep's basic shape, and emphasizing its positive symbolic meaning.

4.4 Display of Generated Patterns"

This section outlines the full pattern design process, aiming to create culturally innovative products by integrating traditional Yugu elements with modern aesthetics.



Fig. 10. Final Pattern Image source: Drawn by the author)

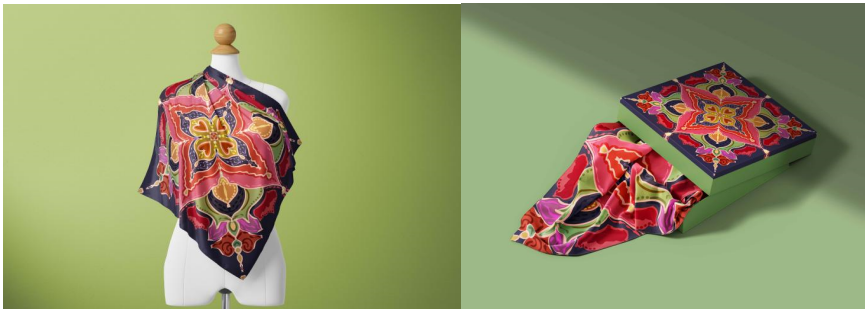


Fig. 11. Cultural Creative Product Image source: Drawn by the author)

The process begins with "form integration," combining deduced patterns into an initial prototype. Then, in the "color application" phase, traditional Yugu colors enhance both visual appeal and cultural significance. The final "pattern expression" stage, as seen in Figure 10, showcases the essence of Yugu patterns, reflecting their auspicious symbolism. These designs extend beyond two-dimensional patterns into various cultural products. Product packaging, shown in Figure 11, highlights the unique pattern characteristics, boosting aesthetic appeal and market competitiveness. These products align with modern trends while conveying the Yugu people's vision of "good fortune and happiness."!

5 Conclusion

This study applies the theory of design semiotics to explore the cultural essence and innovative applications of Yugu clothing patterns from three dimensions. In terms of cultural expression, the intangible cultural heritage of traditional Yugu clothing patterns stems from their folk beliefs, ritual activities, and other elements of their folk culture. These objective and subjective factors together shape the cultural characteristics of the Yugu people.

Yugu clothing patterns convey symbolic meanings, reflecting desires for protection and happiness. Their long history of migration has influenced distinctive yarns, dyeing, and weaving techniques. From a syntactic design perspective^[12], the patterns' inclined arrangements and use of black and hemp colors are key compositional rules. Different cultural contexts have shaped Yugu aesthetics, once rooted in totem worship and vibrant colors, now shifting toward cost-effectiveness, cultural significance, and fashion under contemporary ideologies. While modernization limits some traditional functions, Yugu clothing's cultural heritage remains. This paper uses design semiotics to explore the connection between Yugu lifestyle and clothing, aiming to preserve and adapt this heritage to modern trends. Redesigning these elements offers opportunities to bridge tradition and modernity.

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