

RESEARCH ON THE RE-DESIGN APPLICATION OF “JIESHOU” COLORED

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Received: 18 Oct 2024 | Revised: 18 Nov 2024

Accepted: 27 Nov 2024 | Published: 20 Dec 2024

DOI:

ABSTRACT

To explore the application strategy of “JieShou” pottery decoration elements in modern cultural and creative production design, to protect the inheritance and development of “JieShou” pottery culture, and to improve the inheritance path of revitalized “JieShou” pottery culture. The paper adopts the theory of shape grammar, combines the literature method, and utilizes computer-aided design to systematically excavate and analyze the depth of “JieShou” colored pottery decorations. The culture of the shape is used to deduce and transform the patterns of “JieShou” colored pottery, obtain new derivative patterns, and apply them to the design of cultural and creative products. A series of innovative derivative patterns of the original patterns of “JieShou” colored pottery have been realized, and these derivative patterns have enriched the traditional visual expression of “JieShou” colored pottery patterns, broadened their cultural dissemination and promotion paths, and also promoted the effective dissemination and living inheritance of China's traditional cultural resources in the contemporary context.

Keywords: “JieShou” Colored Pottery, Shape Grammar, Pattern Design, Cultural and Creative Products

INTRODUCTION

“JieShou” colored pottery is a traditional folk-art form rooted in “JieShou” City, Anhui Province, China, famous for its unique shape and rich decorative patterns, known as "a bright pearl of ceramic art in the Central Plains". “JieShou” colored pottery is a kind of ceramic production technology originated from the Tang and Song dynasties, and reached prosperity in the Ming and Qing Dynasties, especially in the process of modern development has formed its own distinctive local characteristics and artistic style, and was included in the first batch of national intangible cultural heritage list by the State Council in 2006, and “JieShou” colored pottery has been exhibited in more than ten countries such as Eastern Europe and Japan for many times in the 1970s, and has been regarded as "a form not to and rich in decorative patterns". "There is a shape not to the meaning of the wonderful.

As an important intangible cultural heritage, “JieShou” colored pottery has a history of several thousand years, and its pattern design carries rich cultural connotation and historical significance. By studying the application of its decoration, it helps to protect and inherit this cultural treasure. The pattern arrangement of “JieShou” colored pottery is mostly bipartite and quadripartite, which is suitable for the derivation of regular patterns. Shape grammar can derive regular patterns according to the basic shapes inputted by the designers in accordance with their evolution rules, and these patterns with geometrical forms and cultural connotations can be applied in the design of cultural and creative products. By applying the theory of shape culture and using cultural and creative products as a carrier, the “JieShou” colored pottery culture is integrated into it, which better conforms to the development of the times.

PROBLEM STATEMENT

As a treasure of Chinese traditional folk art, “JieShou” painted pottery has high historical and cultural value and artistic value with its unique production process, bright colors and exquisite patterns. However, in modern society, the development of “JieShou” colored pottery is also facing some difficulties.

Intergenerational transmission break

Due to the accelerated pace of modern life, the younger generation's understanding of and interest in traditional skills has weakened, and fewer and fewer craftsmen are willing to devote themselves to this craft, which requires long-term study and patient carving, leading to the inheritance of “JieShou” pottery, an intangible cultural heritage, is facing a crisis.

Low degree of marketization

With changes in people's lifestyles, the practical functions of “JieShou” Ceramic Art have gradually diminished, being supplanted by more convenient and durable industrial products. Currently, the value of “JieShou” ceramics lies predominantly in its artistic and cultural significance. Therefore, to sustain and develop this traditional culture, it is essential to integrate modern design elements, developing more practical cultural and creative products that can preserve this cultural heritage while making it relevant to contemporary life.

LITERATURE REVIEW

Through the literature search, it is found that the applied research on “JieShou” colored pottery decoration mainly analyzes and researches “JieShou” colored pottery decoration from the theoretical perspectives of cultural heritage protection, iconography, semiotics and so on. Part of the literature adopts an interdisciplinary approach, such as combining anthropological, sociological, and other perspectives.

Perspective of cultural ecology

Gao Feng "“JieShou” colored pottery art and its protection in the cultural ecological context" on the “JieShou” colored pottery art characteristics and its production process to explore. Hu Jiyan, "Creative Industrialization of Traditional Handicraft Intangible Cultural Heritage under the Perspective of

Cultural Ecology - Taking “JieShou” Painted Pottery in Anhui as an Example”, analyzes and summarizes the current situation of “JieShou” Painted Pottery and its problems, and combines them with the actual situation to seek for new paths of its creative industrialization.

Research from the aspect of image

Fan Huijun ““JieShou” pottery pattern “knife horse man” in the opera factor” explores the “JieShou” pottery “knife horse man” artistry and the relationship between opera and its underlying value. Gao Feng, “The Causes and Artistic Characteristics of “JieShou”’s Colored Pottery with Opera Character Patterns”, explains the causes of the formation of “JieShou”’s colored pottery with opera character patterns and its artistic characteristics.

Intangible Culture Protection and Inheritance Development

Chen Jing “intangible cultural heritage derivatives development strategy research” - to accept the colored pottery as an example of the article from the perspective of product design, tourism culture, analysis of its product derivatives direction, level and strategy. Prince Raider’s “Study on the livelihood and resource development of “JieShou” colored pottery” puts forward the idea of deepening the inheritance and development of colored pottery from the perspectives of intangible cultural heritage protection and resource development.

Research on the application of “JieShou” painted pottery decoration is a comprehensive subject involving history, art, design, cultural protection and inheritance and other fields, the current research has made some progress, but there is still a large space for development, especially in the combination of modern scientific and technological means of digital preservation, cultural living inheritance and intelligent design, etc., “JieShou” painted pottery visual and cultural elements should be the use of modern advanced technology to assist in the development of its cultural inheritance and development, and combined with commercial so as to sustain the development of the source of origin. Cultural heritage development, and with the commercial combination so as to sustain the development of a long-lasting source.

RESEARCH PURPOSE

With the help of Shape Grammar Theory, we have comprehensively and systematically analyzed the laws of morphological composition, evolution and decorative characteristics of “JieShou” pottery decoration, and then constructed a set of design language system based on Shape Grammar Theory, which can provide theoretical basis for the digitized transformation and design of “JieShou” pottery decoration. At the same time, it realizes the creative transformation and adaptive use of intangible cultural heritage resources. This process can make the art of “JieShou” colored pottery decoration fit the modern aesthetic standard and design demand, to achieve the purpose of effective protection and inheritance.

RESEARCH METHODS

Literature research method: Through consulting relevant books, academic journals, network resources, etc., systematically comb through the literature on the historical evolution, morphological composition,

and characteristics of patterns of “JieShou” colored pottery. Through many physical samples of “JieShou” colored pottery, using shape grammar theory to analyze its morphological elements, compositional laws, color elements, etc., to refine the morphological factors and color factors of “JieShou” colored pottery decoration. Case study method: selecting representative “JieShou” colored pottery decorations as research objects, using shape grammar theory to analyze their decorations in terms of shape structure, color elements, etc., and refining the “JieShou” colored pottery decorations.

RESEARCH FRAMEWORK

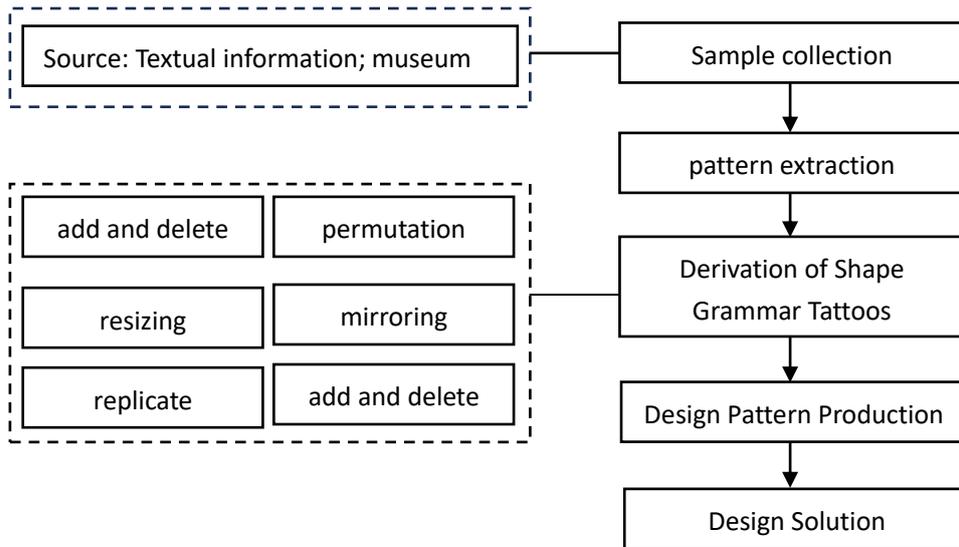


Figure 1: Research framework diagram

The Artistic Characteristics Of “JieShou” Colored Pottery Decoration

The decorative ornamentation of “JieShou” colored pottery is rich in content and comes from a wide range of sources. Its composition mainly consists of symmetrical decorations, two-square and four-square continuous pattern layout, independent unit decorations and rotating decorations and other arrangements. The main body of these motifs can be roughly divided into, plant motifs, animal motifs and character story motifs. The decorations of Jiexiu painted pottery are unique in that it adopts fine carving techniques, and “JieShou” painted pottery not only inherits the exquisite craftsmanship of the Tang Dynasty's three-colored pottery, but also skillfully integrates the aesthetic qualities of traditional Chinese paper-cutting art and woodblock prints, so that the decorations not only retain the simple and heavy traditional style, but also overflowing with the rich folk life and lively atmosphere.

An Overview of Shape Grammar Theory and The Application Of “JieShou” Colored Pottery Decoration

Origins and development of the theory of shaped grammar

Shape Grammar (SG) is a formal design theory and methodology that originated in the field of architectural design for describing and generating rules for geometric shapes, structural layouts and their combinations. It was first proposed by George Stiny. He drew on the linguistic theories of Avram

Noam Chomsky, especially the conceptual framework of the Grammar of Shape, which he successfully transferred to the analysis of visual and spatial forms in the creative design process. Shape Grammar describes the transformation and evolution of shapes through a set of rules that allow designers to derive a series of two-dimensional shapes or three-dimensional works.

Basic Concepts and Principles of Shape Grammar Theory

Shape Grammar, as a design modeling tool, begins with the establishment of a basic system of shape units, a system that is comparable to a linguistic vocabulary, covering a multitude of morphological elements ranging from the simple such as dots, lines, and surfaces to the complex assemblies that form the basis of all designable modules. In this process, shapes are conceived and reproduced in a recursive and non-linear logic: designers follow the basic elements and existing resources of shapes, step by step, layer by layer, to build increasingly complex and sophisticated geometrical constructions. The process is branching and cyclical, resulting in a rich and varied spectrum of forms. Shape Grammar provides a framework in which designers can manipulate basic shape units through abstract rules to systematically generate a collection of forms that conform to specific rules or aesthetic criteria. According to George Stiny's definition of shape grammar expressed as a quaternion formula, both: $SG = (S,L,R,I)$ where S is a finite set of shapes; L is a finite set of symbols; R is a finite set of rules; and I stands for the initial shapes, shapes generated by the shape grammar should be derived from the initial shapes through the shape laws. The derivation rules of shape grammar can be divided into generative and derivative (Der two kinds: generative derivation creates new shapes by adding, deleting, replacing or reorganizing geometric elements. Derivative derivations include scaling, mirroring, copying, rotating, miscutting, Bézier curve transformations, etc.

“JieShou” Colored Pottery Decoration Application Deduction Design

Determine the simulation objects

Adopting online and offline dual paths, several highly representative samples of “JieShou” painted pottery ornaments were widely collected and carefully selected as the core objects of deduction and analysis. Using computer software technology, the typical decorative features of these “JieShou” pottery are analyzed.

Design Factor Extraction

So that the pattern distribution is even and the morphology factor can be divided into geometric patterns, botanical patterns, animal patterns three categories, of which the largest number of patterns is botanical patterns, whether focusing on the theme of the characters of the pottery creation, or around the theme of animal and plant ornamentation design, are skillfully integrated into a variety of plant elements to complement each other, so that they complement the main pattern. In terms of color factor, “JieShou” colored pottery inherits and carries forward part of the glaze technology of ancient Tang Sancai, and its glaze color is mostly red, green, yellow, white, blue and other colors as the colorful and contrasting, forming a warm and rich visual effect. “JieShou” colored pottery decoration layout follows the traditional Chinese aesthetics of the law of balance, whether in the overall shape of the vessel or local decorations to achieve the appropriate complexity and simplicity, sparse and dense, so that the pattern distribution is even without loss of change, to achieve visual balance and harmony.

The use of computer-aided software through the tools of the “JieShou” pottery decoration of the morphology, color factors for re-analysis and interpretation, extraction, and further analysis of the representative decoration factors, the comprehensive screening of the typical factor samples, to carry out the deduction and application of decorations.

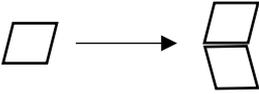
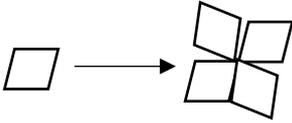
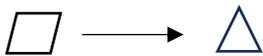
Table 1 Extraction of Morphological Factors of Patterns

Pattern Material 1	Pattern Material2	Pattern Material3	wrinkles of fish	geometric pattern	Straw pattern
Figure1	Figure2	Figure3	Figure4	Figure5	Figure6
Form factor H1	Form factor H2	Form factor H3	Form factor H4	Form factor H5	Form factor H6

Table 2 Extraction library of initial color factors of ”JieShou” painted pottery decoration

Serial No	Sample name	extraction zone	Color Extraction					
S01	Pottery jar with flower pattern		C: 51 M:82 Y:85 K:32	C: 81 M:52 Y:100 K:31	C: 38 M:18 Y:47 K:0	C: 54 M:67 Y: 73 K:12	C: 30 M:59 Y: 46 K:0	C: 25 M:60 Y: 20 K:0
S02	Kiln green glazed jar		C: 87 M:58 Y: 45 K:33	C: 91 M:60 Y: 100 K:42	C: 85 M:5 Y: 89 K:17	C: 39 M:57 Y: 68 K:0	C: 51M:67 Y: 82 K:10	C: 76M:39 Y: 75 K:1
S03	Pottery Jar with Figures		C: 8 M:56 Y: 75 K:0	C: 45 M:96 Y: 80 K:14	C: 61M:33 Y: 69 K:0	C: 33 M:50 Y: 73 K:0	C: 27 M:19 Y: 27 K:0	C: 28 M:67 Y: 73 K:0
S04	Crossword Puzzle Pottery Jar		C: 53 M:90 Y: 98 K:33	C: 47 M:82 Y: 100 K:14	C: 56 M:95 Y: 100 K:47	C: 78 M:44 Y: 87 M:4	C: 65 M:63 Y: 93 M:27	C: 58 M:68 Y: 82 M:22

Table 3 Rule derivation process

R1(Replication)	R2(Scaling)	R3 (Horizontal Mirror)
		
R4 (Vertical Mirror)	R5 (Center Rotation)	R6(Endpoint Rotation)
		
R7 (Increase)	R8 (Deletion)	R9 (Bessel Curve)
		

“JieShou” colored pottery ornamentation deduction design

Aiming at the samples of basic morphology factors of Jiexiu colored pottery decoration, the deduction design is carried out by using shape grammar, and the deduction includes two forms of generative deduction and derivative deduction. The specific process is as follows Fig. 2: Choose the morphology factor H2 as the research object; carry out the deduction design of shape grammar. First of all, import the H2 graph into the computer software, execute the (R8) command on Fig. 2a to delete the graph to get Fig. 1b, execute the rotation (R5) on Fig. 2b to get Fig. 1c, and execute the Bessel curve (R9) on Fig. 2c to get Fig. 1d, so as to make it smoother and more geometrical. Continue to copy (R1) and mirror (R3) to get Figure 2e, then rotate (R5) and mirror (R3) to get Figure 2f, and continue to mirror (R3) and mirror (R4) commands to generate Figure 2g, which is in line with the basis of the use of the corresponding cultural and creative products.

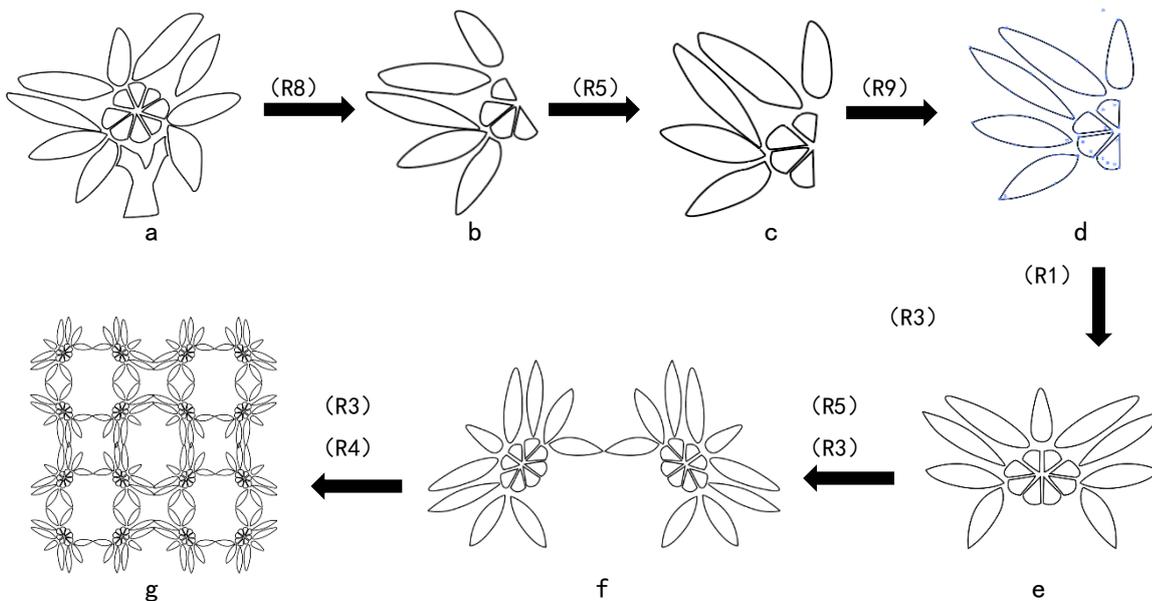


Figure 2: Derivation of “JieShou” colored pottery decoration

Figure 3: Morphological factor H5 is selected as the object of study for the deductive design of morphosyntax. First of all, the H5 graphic is imported into the computer software, the command (R8) deletion is executed on 3a to get Fig. 3b, the (R9) Bessel curve is executed on Fig. 3b to get 3c, the (R3) vertical mirroring of Fig. 3c is executed on 3c to get Fig. 3d, and then continue the (R4) mirroring to get Fig. 3e, and then continue the (R3) mirroring and (R4) mirroring to get Fig. 3f, which is in line with the corresponding cultural and creative products. Figure 3f conforms to the corresponding cultural and creative products.

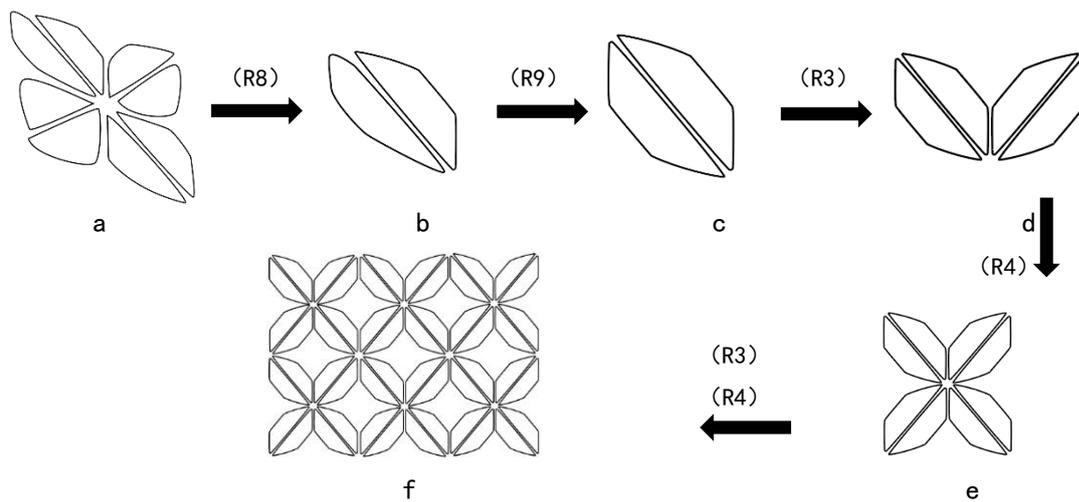


Figure 3: Derivation of “JieShou” colored pottery decoration

Figure 4: Morphological factor H6 is chosen as the object of study for the deductive design of shape syntax. Firstly, the H2 graphic is imported into the computer software, and the (R8) delete command is executed on Fig. 4a to get Fig. 4b, and then continue to execute the rotation (R5) on Fig. 4b to get Fig. 4c, and execute the Bessel curve (R9) on Fig. 4c to get Fig. 4d, so as to make it more smoother and geometrically more shapely. At the same time, perform (R3) mirroring on Figure 4d to obtain Figure 4f, and then continue to perform mirroring (R3) and mirroring (R4) to generate the corresponding cultural and creative products that conform to the use of the basic Figure 3g.

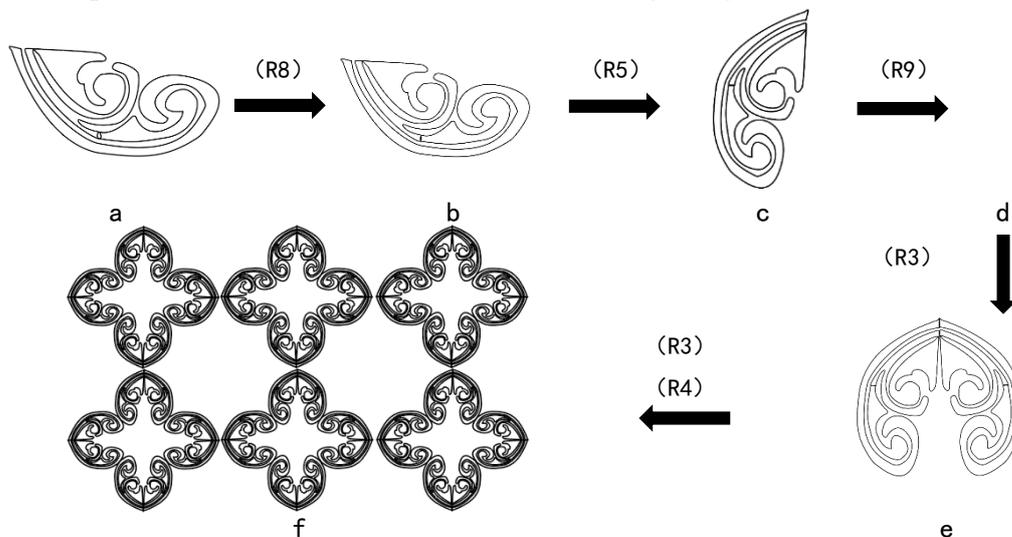


Figure 4: “JieShou” colored pottery decoration deduction three

Figure 5: The morphology factor H3 is chosen as the object of study for the deductive design of shape syntax. Firstly, the H2 graphic is imported into the computer software, and the (R8) delete command is executed on Fig. 5a to get Fig. 5b, and the (R8) delete and Bessel (R9) delete commands are continued on Figure 5b to get Figure 5c, and the (R3) mirror is executed on Figure 5c to get Figure 5d, and the (R7) increase command is executed on Figure 5d to get Figure 5e, and the (R3) mirror and (R4) mirror commands are applied to generate the corresponding base figure 5g which is suitable for the use of cultural and creative products. The (R3) mirroring and (R4) mirroring commands are applied to Figure 5e to generate the corresponding base figure 5g, which is suitable for the use of creative products.

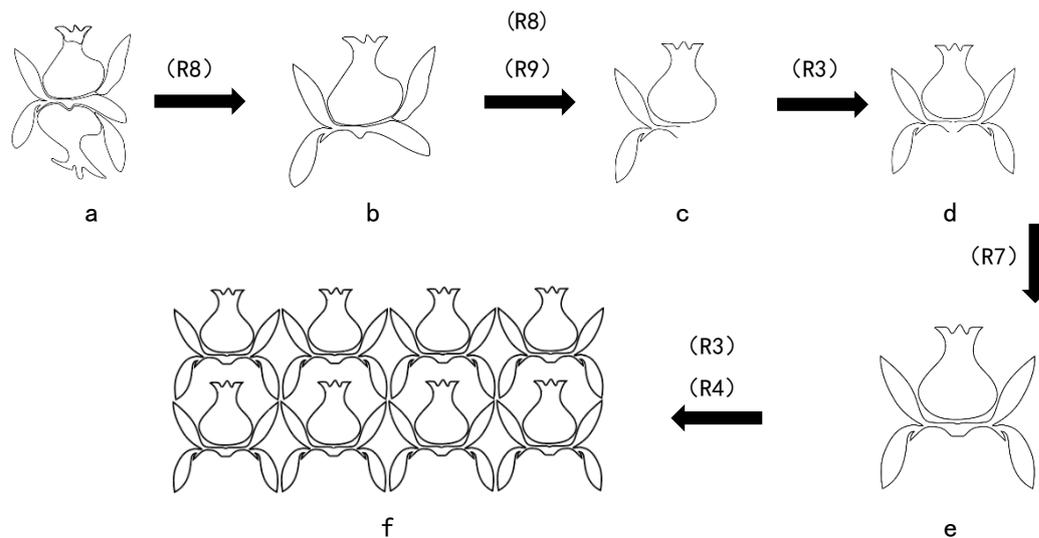


Figure 5: Derivation of “JieShou” colored pottery decoration

The Application of Cultural and Creative Product Design of “JieShou” Colored Pottery Decoration

Continuation of cultural genes

“JieShou” painted pottery decorations have united the wisdom and aesthetics of working people and art workers through the ages, whether it is a plant pattern, animal pattern or figure pattern. Whether it is plant patterns, animal patterns or character patterns, they all depict the rich and colorful cultural landscape of the Chinese nation over the past thousand years [7], and these patterns carry rich historical and cultural codes. When we skillfully integrate these decorations into the design of cultural and creative products, we are essentially carrying out a profound cultural gene translation, so that “JieShou” pottery decorations of traditional culture and art can be carried forward in the design carrier and innovative interpretation.

Expansion of decorative arts

The application of “JieShou” pottery decoration in modern cultural and creative products is in fact a kind of extended reshaping and re-innovation expression of traditional artistic heritage. These decorations, full of age-old marks and deep cultural symbolism, when skillfully integrated into modern cultural and creative product design concepts, not only maintain the purity of the traditional cultural foundation and spiritual core, but also infuse the modern design field with new vitality and innovative thinking.

Industrial upgrading and market expansion

As a cultural symbol, “JieShou” pottery decoration not only enhances the cultural value and artistic taste of cultural and creative products, but also helps the whole cultural and creative industry transform from single product manufacturing to branding with more cultural added value. In the process of this transformation, the related cultural and creative product design has also led to the improvement of the related industrial chain, including the supply of raw materials, product research and development, design services, marketing and other aspects of synergistic development.

Design application program generation

By refining and transforming the unique design elements of “JieShou” pottery and combining them with in-depth analysis of market demand, women's silk scarves are chosen as the medium of creative presentation. As an artistic treasure rich in traditional Chinese aesthetics and regional cultural heritage, “JieShou” colored pottery shows wide adaptability and innovation in the field of modern fashion design, and when its exquisite patterns are skillfully integrated into the design blueprint of women's silk scarves, it can undoubtedly create a unique product series with both classical flavor and fashionable atmosphere. (Figure 6) shows the effect of silk scarf products formed by shape grammar using factor H3, H5 and H6 as design factors respectively.

The patterns derived from the elaborate interpretation and re-creation of the art of Jiexiu colored pottery contain a wealth of auspiciousness, good fortune, luck, longevity and joy, and other beautiful symbols, which contain deep cultural connotations. When these symbolic patterns are reproduced and inherited in the design of the silk scarf, it not only makes the silk scarf go beyond the purely decorative function, but also sublimates it into a kind of fashion accessory with deep cultural load significance.

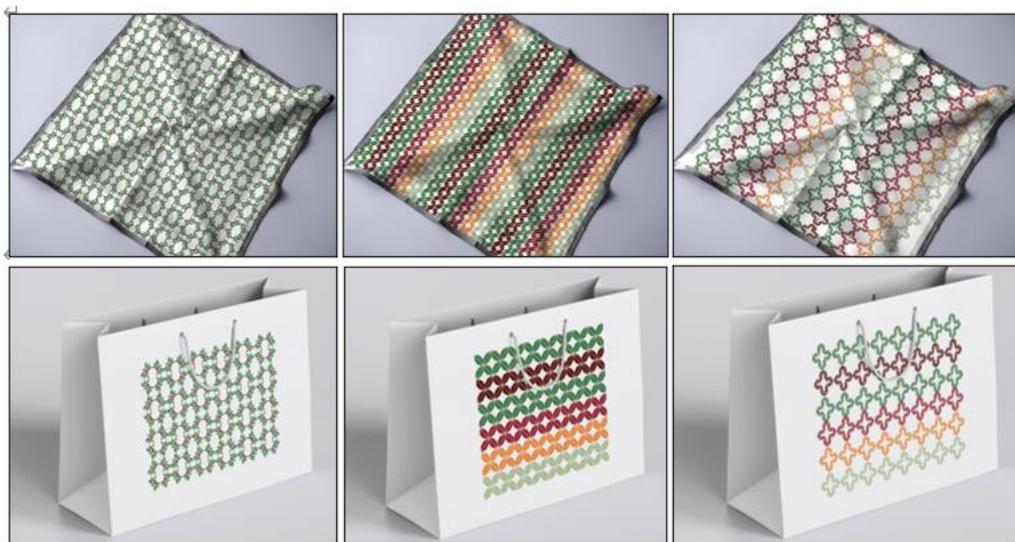


Figure 6: Product Application Renderin

CONCLUSION

Shape grammar provides systematic and structured theoretical support for the innovative design of “JieShou” pottery decoration. Through the morphological analysis and geometrical processing of decorative elements, a series of basic shape elements and combination rules can be extracted to effectively guide the generation of decorative design factors. At the same time, the re-creation of “JieShou” pottery decoration with the help of shape grammar tools can maintain the traditional artistic style and cultural connotation while giving it modern aesthetic and practical functions, realizing the perfect integration of traditional culture and modern design.

The application of these derivative patterns in cultural and creative products enriches the traditional visual expression of “JieShou” colored pottery decorations, broadens its cultural dissemination and promotion channels, and also promotes the effective dissemination and living inheritance of China's traditional cultural resources in the contemporary context.

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