


# The Innovative Application of Peony Flower Patterns in Gaomi Puffy Grey New Year Paintings in the Pattern Design of Clothing Products

Jiahui Sun , Lin Yang\*, Zhuangzhuang Hou

Dalian University of Foreign Languages, Dalian, 116044, China

Correspondence: southampton\_yanglin@dlufl.edu.cn

Citation: Sun, J., Yang, L., & Hou, Z. (2025). The innovative application of peony flower patterns in Gaomi puffy grey new year paintings in the pattern design of clothing products. *Journal of Arts & Cultural Studies*, 4 (1), 1-13.  
<https://doi.org/10.23112/acs25060101>



Received: March 5, 2025  
Revised: April 1, 2025  
Accepted: May 5, 2025  
Published: June 1, 2025



**Publisher's Note:** KIHSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2025 by the authors. Submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Abstract:** *Background:* National policies that promote the preservation of intangible cultural heritage recognize Gaomi puff ash New Year's paintings as an important Shandong folk art form. These paintings feature rich floral patterns with distinctive symbolic and decorative meanings, which require modern conservation. *Purpose:* This study centers on these floral patterns, examining their traditional visual characteristics and cultural symbolism, exploring their integration into modern clothing design, and highlighting the patterns' recent transformation to infuse products with unique cultural connotations and aesthetic value. *Methods:* The research employs literature reviews, field surveys, and literature visualization based on CiteSpace to collect and analyze materials related to Gaomi puff ash New Year's paintings. It further conducts secondary design of the patterns using Procreate, AI, and shape grammar. *Results:* The study defines the visual and symbolic attributes of the floral patterns, establishes a feasible path for their transformation into modern clothing designs through shape grammar, and verifies the adaptability of traditional motifs in modern fashion contexts. *Conclusion:* Exploring the innovative application of these patterns in modern clothing design offers new insights for preserving and innovating intangible cultural heritage, contributing to the protection and preservation of traditional culture in contemporary society.

**Keywords:** Gaomi puffed grey New Year's paintings, Floral motifs, Pattern design, Clothing items, Cultural innovation

## 1. Introduction

### 1.1 Research Background

In recent years, the State has placed great importance on the cultural protection of intangible cultural heritage and recognizing it as a vital part of China's rich traditional culture. In 2021, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued "The Opinions on Further Strengthening the Protection of Intangible Cultural Heritage," which clarified the target direction and tasks for the protection of intangible cultural heritage in the new era.

China has established a four-level system for listing representative projects of intangible cultural heritage (ICH) at the national, provincial, municipal, and county levels. Currently, there are more than 100,000 ICH representative projects recognized, and 1,557 at the national level. With the development of new media technology, there are new opportunities for the dissemination and protection of non-heritage culture.

### 1.2 Research Purpose

This paper focuses on the innovative application of floral patterns from Gaomi ash New Year's paintings in the design of apparel products. As globalization advances, the

state advocates the vigorous preservation and promotion of traditional culture. General Secretary Xi Jinping has repeatedly emphasized on numerous public occasions that China's excellent traditional culture is both invaluable and unique. This paper aims to contribute to that effort by bridging heritage and innovation of traditional culture in response to the call of the state, seeking to integrate traditional culture and modern products. The goal is to translate and revitalize traditional culture through innovative design. The essence of the excellent traditional Chinese culture is excavated, refined, and integrated into apparel, transforming abstract concepts into tangible objects, thus creating products that are both culturally rich and have market value.

### 1.3 Research Content

First, the data and information obtained from the research are collated and summarized through a literature review. Next, the core floral pattern elements found in Gaomi ash New Year's Paintings are extracted, and graphic design is carried out through shape grammar. Finally, while preserving the distinctive local cultural characteristics of Gaomi Ash New Year's Paintings, modern design concepts are incorporated to achieve the perfect integration of traditional art and modern life.

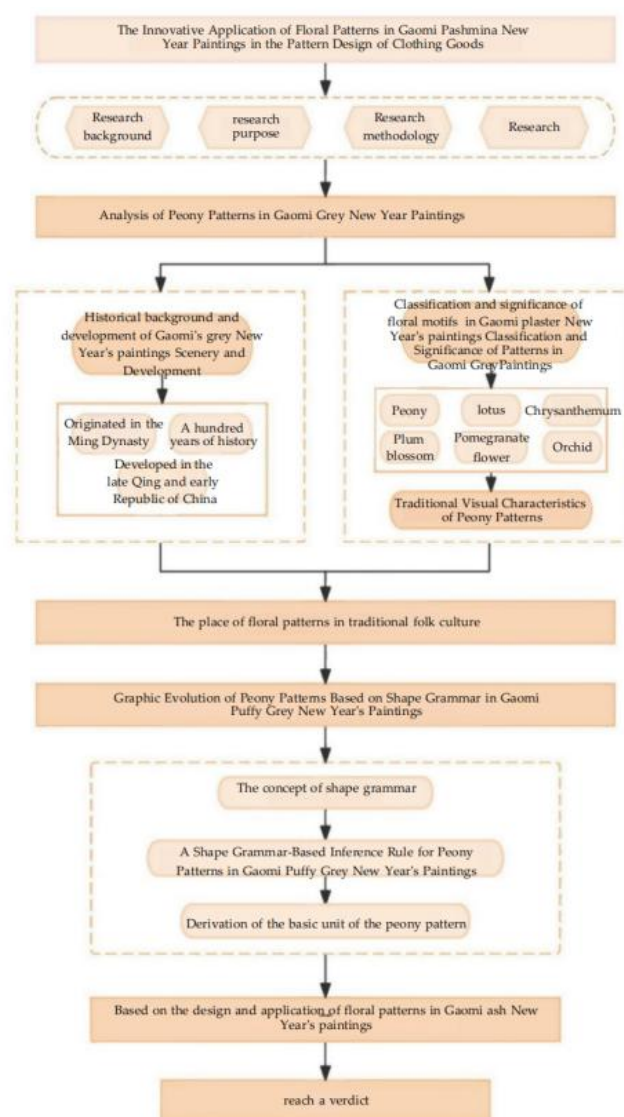


Figure 1: Frame diagram

## 1.4 Research Methods

**Literature Research Method:** This approach involves reviewing and analyzing books, journals, and academic articles related to this topic. Collation research is carried out to provide theoretical support for this study.

**Survey Research Method:** Set the background of the promotion of traditional culture, through status quo research and analysis, to understand the acceptance of consumers for puffy grey New Year's paintings.

**Field Research Method:** This includes visiting museums to conduct in-depth field research and field studies, accumulating rich information, and laying a good theoretical foundation for subsequent research.

**Pattern Transformation Method:** This involves deconstructing and reconstructing patterns through shape grammar and innovative design based on basic compositional laws.

## 2. Literature Review

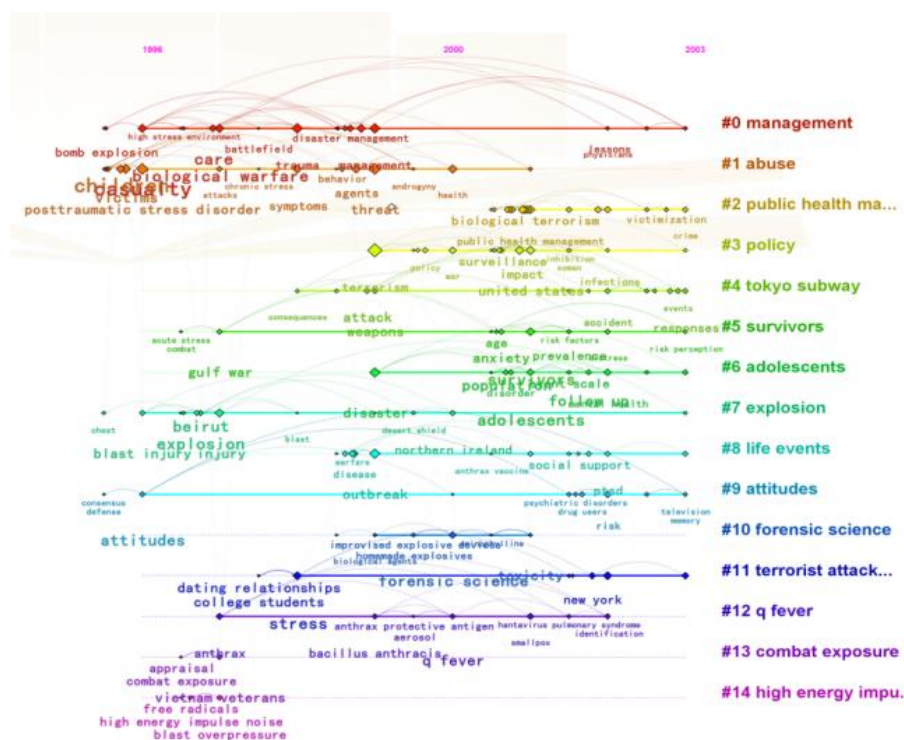


Figure 2: Domestic research on puffy grey annual paintings and shape grammar  
Source: Literature analysis tools Citespace

Recent analysis using CiteSpace on articles from the CNKI database related to 'Gao Mi Push-Ash New Year's Paintings' and 'Shape Grammar' found that in recent years, scholars mainly focus on the basic and applied research of Push-Ash New Year's Paintings (Figure 2).

Scholars have conducted basic research on various aspects of puff ash New Year's paintings. They have compared these paintings to Yangjiabu woodblock prints to explore their artistic color features and cultural connotations (Lee, 2023). Additionally, they have analyzed the historical origins and associations of push ash paintings from the perspective of Tang and Song painting styles (Lu & Pan, 2023). It has been found that women's dresses depicted in these paintings are formalized, planar, decorative, and regular in design (Jiang & Li, 2023). Furthermore, the cultural connotation and folk art aesthetics conveyed by image symbols have been emphasized (Lan, 2023). The studies also examine the production process, artistic style, and paper visual effect to reveal the

artistic value of the painting (Yang & Fang, 2023). Researchers have explored the opportunities and challenges for the development of these artworks under the integration of culture and tourism, proposing measures for revitalization and preservation (Zhao, 2023). Moreover, there is a focus on inheritance and development methods under the vision of ICH (Hu, 2019).

Some scholars focus on the applied research of puffy grey New Year's paintings, discussing their artistic language and cultural connotation. They propose that the cultural and creative industry can revitalize traditional culture and stimulate economic growth, and make cultural and creative products more engaging (Ding, 2023). One area of exploration involves the female image of Gaomi Puffy Grey New Year's Paintings, examining its application in cultural and creative products and generating new ideas (Dong, 2023). Additionally, research aims to analyze the pictorial characteristics of these artwork and their combination with domestic animation to help the preservation of non-material heritage (Cao, 2022). Moreover, it will study the application of its auspicious motifs in trendy apparel, opening up new paths for inheritance innovation and non-heritage protection (Liu, 2022).

In recent years, shape grammar research has focused on innovative design and rule derivation. Research on the inheritance and innovation of the Han Dynasty Yunqi pattern shows that shape grammar can achieve design innovation and diversity (Zhang & Park, 2025). The deconstruction and innovative design of the Polaris statue pattern verified the feasibility and effectiveness of the scheme through fuzzy comprehensive evaluation (Du et al., 2025).

The core elements of Wenxi flower buns have been refined and transformed for application in cultural and creative design to provide ideas for the digital transformation of intangible heritage (Gao et al., 2025). The combination of shape grammar with Yao Tou kiln porcelain patterns offers new avenues for innovative design and cultural inheritance (Jin et al., 2025).

The deduction and innovative design of red brick carving patterns employ hierarchical analysis and fuzzy comprehensive evaluation method for program selection (Wang, 2025). The introduction of shape grammar to standardize graphic conversion and innovative design broadens design ideas, standardizes the process, and improves efficiency (Song & Li, 2025). Research on the innovative design of traditional lacquer ware in Fujian explores modern forms while preserving regional characteristics (Shao & Zhang, 2025). Expandable semantics and shape grammar derivation methods address challenges in pattern inheritance and innovation (Li & Che, 2025). Furthermore, integrating cultural, fashion, and scientific elements into design products can expand market coverage (Zhang et al., 2025).

Establishing a digital resource library for patterns and using shape grammar deduction rules combined with computer-aided design technology can facilitate the recreation of designs (Zhang, 2024). A bibliometric analysis has been employed to sort out shape grammars for research and practical applications (Li & Liu, 2024). The characterization of the flower yao pick pattern using shape grammar to meet market demand (Zhang & Fan, 2024).

Innovations in bamboo weaving patterns using shape grammar promote creativity (Liu et al., 2024). Shape Grammar-based graphic applications in cultural and creative design are also being explored (Liu, 2024). Research on the innovation of the Baoxianghua pattern provides a systematic and standardized theoretical framework (Wu & Liang, 2024). The analysis and deduction of tattoo patterns provide new methods for logical reasoning (Yeh, 2022). Innovative solutions in Fengxiang clay sculpture are applied to various products to enhance market competitiveness (Lu, 2022). Cultural and creative products exhibit a rich variety and form to meet consumers' needs (Li & Zhang, 2022). The combination of design semiotics and shape grammar, with perceptual engineering and eye movement experiments, enables a scientific analysis of user preferences (Jiang, 2022).

As a result, the academic community is focused on artistic resolution, and this paper examines the transformative application of floral motifs based on shape grammars.

Table 1: Summary of Literature Features

Research Direction	Reference	Trait
Basic research	Research on the inheritance and development of Gaomi's 'Puffing grey New Year's Paintings' under the vision of non-heritage.	The article explores the artistic characteristics of Gaomi's puffy grey New Year's paintings from a basic study of the paintings themselves.
	A Comparative Study on the Color of Yangjiabu Woodblock Prints and Gaomi Puffy Ash New Year Paintings.	
Applied Research	The Application of Female Figures in Puffy Grey New Year's Paintings in Cultural Creative Products.	Analyzing the application value of Gaomi's Ash New Year's paintings and exploring their cultural innovation with modern design.
	A study on the application of auspicious motifs in puffy grey New Year's paintings in trendy apparel.	
Shape Grammar	Research on Innovative Design Method of Polaris Statue Pattern Based on Shape Grammar.	The article explores the innovative and diverse nature of shape grammars for design.
	A Study on the Application of Shape Grammar in the Regeneration Design of Wenxi Flower Bun Patterns.	

3. Analysis of Peony Patterns in Gaomi Puffy Grey New Year Paintings

3.1 The Historical Background and Development of Gaomi's grey New Year's paintings


Originating in the Ming Dynasty, Gaomi Puffy New Year's paintings were named after the technique of 'Puffy', which is characterized by soft colors. They were included in the national non-heritage list in 2006 and have been widely used in modern design and cultural and creative products in recent years, demonstrating the value of traditional art inheritance and innovation.






3.2 The Artistic Characteristics of Floral Patterns in Gaomi Puffy Grey New Year Paintings

1) Classification and Symbolism of Floral Patterns

There are many types of floral patterns with auspicious meanings, reflecting folk beliefs and aesthetics (Table 2).

Table 2: Flower pattern classification legend

Types of flowers	Pattern examples	Tattoo symbol
Peony		Peony symbolizes wealth, glory, prosperity, and happiness, and its blooming gesture signifies a good life and prosperous career, which is a visual representation of the concept of 'blooming wealth' in New Year's paintings.

Lotus		The lotus flower symbolizes purity, elegance, and righteousness, often combined with lotus seedpods and fish to form auspicious motifs such as 'Lunar New Year Prosperity'.
Chrysanthemum		The chrysanthemum represents resilience, longevity, and purity, and is a folk symbol of respect for the elderly. It also signifies tenacity and noble character.
Plum blossom		The five petals of the plum blossom symbolize 'five blessings', and its early spring bloom is often used as a metaphor for resilience and the blessing of a happy new year.
Orchid		Orchids signify high purity, innocence, fortitude, and the virtue of a gentleman, and symbolize the indifference to fame and fortune as a symbol of the literati and the refined.
Pomegranate flower		Pomegranate flowers and fruits often appear together, symbolizing 'many children, many blessings' and 'family prosperity', signifying a thriving and prosperous population.

## 2) Traditional Visual Characteristics of Peony Patterns

Peony motifs show folk aesthetics with vivid shapes and strong colors.

1. Stylistic Features: Peony patterns are characterized by exaggerated, generalized designs that are highly pictorial. They often display radiating or symmetrically unfolding petals, smooth and tense lines, and curling and extension of the leaves of the flowering branches, highlighting the prosperity and prolongation of the flower, and with a rich sense of dynamism and rhythm.

2. Compositional Features: The compositions are typically symmetrical, balanced, and full of elements. Peonies are often combined with butterflies, birds, fruits, figures, and other auspicious elements, with rich layers and balanced space, showing strong decorative aesthetics and a sense of ceremony.

3. Color Characteristics: The peony pattern found in Gaomi ash New Year's paintings has strong color contrasts and strong tones, with peach red, emerald green, pink and yellow as the main features, and the stamens are embellished with gold, which has a strong visual impact, and with the contrast of red and green, which is festive and has a decorative effect.

## 3) The place of floral patterns in traditional folk culture

Floral patterns are an important part of traditional Chinese patterns, a form of decorative art, embodying emotional attachment, cultural beliefs, and aesthetic interests. They are widely used in folk art and serve as important visual symbols in ceremonial activities, with values of inheritance and innovation.

## 4. Graphic Evolution of Peony Patterns Based on Shape Grammar in Gaomi Puffy Grey New Year's Paintings



#### 4.1 The Concept of Shape Grammar







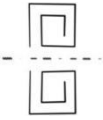
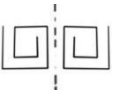




Shape Grammar, introduced by George Stiny in 1972, explores the logic of design language through rules expressed in terms of geometric shapes, consisting of initial shapes and derivation rules. It is a design reasoning methodology that can be used to parse and construct design languages.


#### 4.2 A Shape Grammar-Based Inference Rule for Peony Patterns in Gaomi Puffy Grey New Year's Paintings

A shape grammar can be represented as a set of quaternions  $SG = (S, L, R, I)$ , where  $S$  is a finite set of shapes,  $S^*$  is the set of shapes derived from  $S$  by inference rules;  $L$  is a finite set of labels and has no intersection with  $S$ ;  $R$  is a finite set of inference rules with the basic form  $\alpha(S, L) \rightarrow \beta(S, L)$ , where  $\alpha$  is the left-labelled shapes of the shape inference,  $\beta$  is the right-labelled shape,  $\beta$  can be the empty set;  $I$  is the initial shape, which is the unit shape extracted from the original pattern.

The rules of deduction using shape grammar are categorized into 'inheritance' and 'modification' (Table 3).

Table 3: Derivation rules for shaped grammars



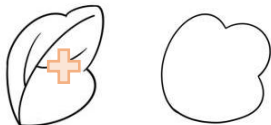



Initial shape	Rules of deduction		Legend
	Rule 1	Replacement	
	Rule 2	Rise	
		Deletion	
	Rule 3	Downsize	
		Zoom	
	Rule 4	Vertical mirroring	
	Rule 5	Horizontal mirroring	
	Rule 6	Center of rotation	
	Rule 7	Rotation about the origin	
	Rule 8	Panning	
	Rule 9	Shear mapping	

	Rule10	Bessel curve	
--	--------	--------------	---

4.3 Derivation of the Basic Unit of the Peony Pattern




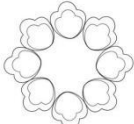
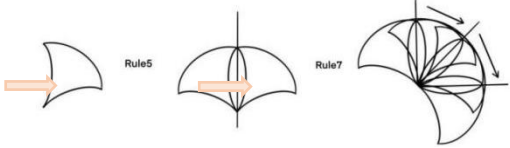
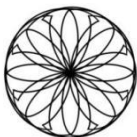
Peony floral patterns have cultural connotations and artistic value in the plaster New Year's paintings. This paper extracts the peony form from 'Pomegranate Blossoming Hundred Sons' and 'Gossip of Auntie and Sister-in-law', and analyzes the elements of leaves and petals (Table 4).

Table 4: Shape Grammar Deducing the Design Process of Peony Pattern Elements

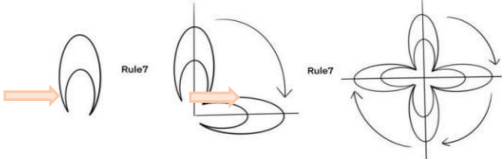
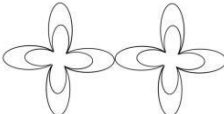
Elemental	Outline	Elemental decomposition
 "Peony with a Hundred Seeds"		
 "Grandmother and Sister's Chat"		

Option 1: The leaf is mirrored horizontally and then panned to get unit 1, the petal is reduced, and then rotated by 45° to get unit 2. Scenario 2: The leaf is mirrored horizontally and then rotated 45° to obtain cell 3, the petal is rotated 90° four times and then panned to obtain cell 4, and the petal is reduced and then panned to obtain cell 4 (Table 5).

Table 5: Shape Grammar Deducing the Design Process of Peony Pattern Elements

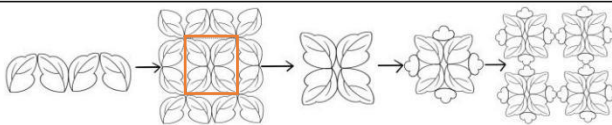

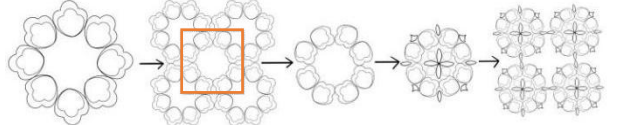

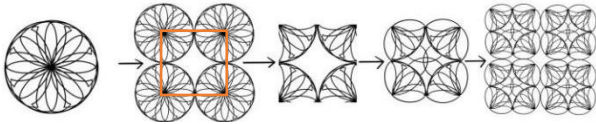
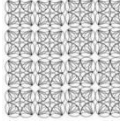
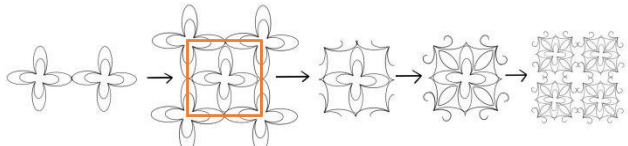
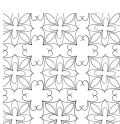
Serial number	Sequence of events leading up to a decision	Generating unit
Module 1		
Module 2		
Module 3		



Module 4		
----------	---	---

The first four units will be arranged in four directions, extract the center part of the secondary design, add details to enrich the graphics, and then create a four-way arrangement of the final results (Table 6).

Table 6: Evolutionary graph redesign process

Serial number	Evolutionary Graphics Redesign	Final result
Module 1		
Module 2		
Module 3		
Module 4		

## 5. The Application of Clothing Design Based on the Floral Patterns of Puffy Grey New Year's Paintings

### 5.1 Industrial Background

In recent years, the cultural and creative products industry has experienced significant growth by combining traditional culture with fashion trends. China has established a complete industrial chain that covers the whole process from creative design to consumer sales. The main consumer groups are individuals born in the 1990s and 2000s, with particular emphasis on women from the post-2200 generation (Table 7).

Table 7: Proportion of purchases by product type for cultural and creative endeavours

Product type	Purchase ratio
Food and beverage category	33.57%
Wearable	30.34%
Decorative category	28.55%
Stationery and handbooks	28.01%
Home and living category	26.39%

The apparel, cultural, and creative industry significantly contributes to the trend of diversification and personalization trends, aiming to satisfy consumer demand for personalized experiences, cultural content and high quality (Table 8).

Table 8: Classification of Clothing and Accessories Cultural Creations

Typology	Product Background
Silk neckband	Silk scarf cultural and creative products, with their unique artistic charm and practicality, have shown a trend of steady growth, and the consumer group has gradually expanded. In particular, young groups such as the post-90s and post-00s have gradually become the primary consumers of the silk scarf industry.
Bag	According to market data for 2024, handbags have the highest market share of 36 per cent; general bags and storage bags account for 26 per cent; box bags and briefcases account for 25 per cent; and small accessories account for 13 per cent. Large bags are becoming popular, especially shoulder bags and underarm bags, which are more popular with younger consumers.
Earrings	Earrings, cultural and creative products, occupy an important place in the market of trinkets, where the decorative aspect becomes the main motivation for their purchase.
Necklaces	Necklace creations, on the other hand, are favored by the jewellery market for their unique design and high-quality materials.

Using silk scarves and bags as carriers, we can apply shape grammar to derive the peony pattern found in Gaomi's puffy grey New Year's Paintings. This shows the inheritance and innovation of traditional culture, and opens up new paths for the development of ancient art in the modern era.

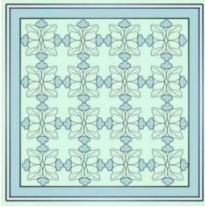

5.2 The Design Significance of Floral Patterns Applied to Clothing Goods

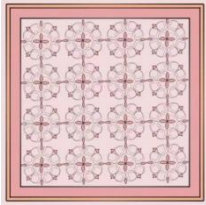

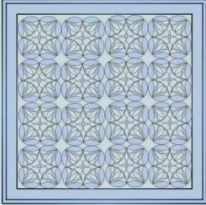



Applying the peony pattern of Gaomi ash New Year's paintings to the design of apparel gives the product a deep cultural value. At the same time, its dynamic shape and distinctive colors enhance the product's artistic expression and aesthetic appeal.

5.3 Innovative Design Applications of Peony Patterns

In this paper, the four unit motifs are applied to silk scarves and bags, preserving both traditional features and modern style (Table 9).

Table 9: Innovative design of peony pattern

Serial number	Silk neckband	Bag
Module 1		

Module 2		
Module 3		
Module 4		

6. Conclusion

Gaomi ash New Year paintings are valuable treasures of Chinese folk art. Their floral patterns not only have high decorative and aesthetic values, but also carry deep cultural symbolism and folklore. This paper provides a careful classification of the floral patterns found in Gaomi ash-colored New Year paintings. It offers a deep analysis of the symbolic meaning of each type of floral pattern. For instance, the peony pattern is examined in detail, focusing on its traditional visual characteristics and unique artistic connotations. The findings of this research enrich our understanding of the artistic value of Gaomi grey New Year's paintings and provide a solid theoretical basis and novel design ideas for their innovative application in modern clothing pattern design. This approach contributes to the preservation and development of this traditional art form in modern society.

**Funding:** Graduate student of Dalian University of Foreign Languages in 2024, Innovative projects 'Innovative Application of Gao Mi Puffy New Year's Paintings as an Element in Today's Clothing' (Project Number: YJSCX2024-089).

**Acknowledgments:** Not applicable.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The author(s) declare no conflicts of interest. No individuals other than the author(s) were involved in the study design, data collection, analysis, manuscript preparation, or the decision to publish.

References

Cao, J. (2022). *Research on the use of the pictorial characteristics of Gaomi ash New Year's Paintings in animation creation* [Master's thesis, Sichuan Fine Arts Institute]. doi:10.27344/d.cnki.gscmc.2022.000140.

- Ding, J. (2023). *Research on Cultural and Creative Product Design of Gaomi Ash New Year's Paintings* [Master's thesis, Shandong Academy of Arts and Crafts]. doi:10.27789/d.cnki.gsdgy.2023.000045.
- Dong, L. (2023). The application of the female image of Puffy Grey New Year's Paintings in cultural creative products. *Screen Printing*, (18), 11-14. doi:10.20084/j.cnki.1002-4867.2023.18.004.
- Du, J., Zhu, S., & Su, J. (2025). A new species of the genus *Pseudourostyla* (Hymenoptera, Braconidae) from China. Research on innovative design method of Polaris image pattern based on shape grammar. *Furniture and Interior Decoration*, 32(2), 79-87. doi:10.16771/j.cn43-1247/ts.2025.02.013.
- Gao, Y., Wu, C., Jia, L., & Liu, W. (2025). A study on the application of shape grammar in the regeneration design of Wenxi flower bun pattern. *Design*, 38(7), 90-94. doi:10.20055/j.cnki.1003-0069.002563.
- Hu, Y. (2019). Research on the inheritance and development of Gaomi's 'Push Ash New Year's Paintings' in Shandong under the vision of non-heritage. *Popular Literature and Art*, (22), 6-7. doi:10.20112/j.cnki.issn1007-5828.2019.22.006.
- Jiang, W. (2022). *Research on the extraction and reconstruction method of Miao embroidery pattern based on shape grammar* [Master's thesis, Guizhou University]. doi:10.27047/d.cnki.ggudu.2022.001170.
- Jiang, W., & Li, H. (2023). Aesthetic analysis of women's costumes in Gaomi's grey New Year's paintings. *Fashion Designer*, (12), 46-52. doi:10.20100/j.cnki.cn11-4548/ts.2023.12.006.
- Jin, Q., Zhao, D., & Liu, Y. (2025). A new species of the genus *Pseudopodus* (Coleoptera, Staphylinidae) from China. An investigation of pattern deduction and innovative design of porcelain from Yaotou kiln under shape grammar. *Ceramic Science and Art*, 59(2), 44-45. doi:10.13212/j.cnki.csa.2025.02.015.
- Lan, L. (2023). *Change and reconstruction of image symbols in Gaomi Puffy Grey New Year's Paintings* [Master's thesis, China Academy of Art]. doi:10.27653/d.cnki.gzysy.2023.000160.
- Lee, K. (2023). A comparative study on the colours of Yangjiabu woodblock prints and Gaomi ash-black prints. *Art Literature*, (12), 136-138. doi:10.16585/j.cnki.mswx.2023.12.033.
- Li, J., & Che, L. (2025). A study of Han Dynasty bronze mirror ornamentation based on topable semantics and shape grammar. *Design*, 38(2), 138-142. doi:10.20055/j.cnki.1003-0069.002410.
- Li, S., & Zhang, C. (2022). Regeneration design and application of Ming dynasty celluloid patterns based on shape grammar. *Wool Textile Science and Technology*, 50(7), 78-86. doi:10.19333/j.mfkj.20220302909.
- Li, W., & Liu, W. (2024). A study on the application of shape grammar in design based on bibliometric analysis. *Packaging Engineering*, 45(20), 463-475+490. doi:10.19554/j.cnki.1001-3563.2024.20.044.
- Liu, C. (2024). Innovative design and algorithmic application of han dynasty yunqi pattern based on shape grammar. *Screen Printing*, (18), 61-63. doi:10.20084/j.cnki.1002-4867.2024.18.016.
- Liu, P., Yeh, C., Cui, X., Lin, Z. T., Li, J. X., & Chen, Z. J. (2024). Research on innovative design of Minhou bamboo weaving based on shape grammar. *Furniture and Interior Decoration*, 31(12), 75-81. <https://doi.org/10.16771/j.cn43-1247/ts.2024.12.013>
- Liu, S. (2022). *Research on the application of auspicious patterns in Puffy Grey New Year's Paintings in Chaojiao clothing* [Master's thesis, Qingdao University]. doi:10.27262/d.cnki.gqdau.2022.001959.
- Lu, M., & Pan, D. (2023). Shandong Gaomi Puffy Grey New Year's paintings in the perspective of Tang and Song paintings. *Fine Arts*, (7), 144-146. doi:10.13864/j.cnki.cn11-1311/j.007156.
- Lu, X. (2022). *Research on the application of shape grammar in Fengxiang clay sculpture art modelling design* [Master's thesis, Xi'an University of Technology]. doi:10.27398/d.cnki.gxalu.2022.000062.
- Shao, H., & Zhang, S. (2025). Innovative design of traditional lacquerware patterns in Fujian based on shape grammar. *Beauty and Age (above)*, (2), 79-83. doi:10.16129/j.cnki.mysds.2025.02.014.
- Song, H., & Li, C. (2025). Innovative design and application of Yungang Grottoes Lonicera pattern based on shape grammar. *Screen Printing*, (1), 62-64. doi:10.20084/j.cnki.1002-4867.2025.01.015.

- Wang, Y. (2025). Extraction and derivative design of minnan red brick sculpture patterns under shape grammar. *Journal of Liming Vocational University*, (1), 28-36. doi:10.13446/j.cnki.jlvu.202402025.
- Wu, Y., & Liang, Y. (2024). Research on innovative design and application of Baoxianghua pattern based on shape grammar. *Design*, 37(4), 1-5. doi:10.20055/j.cnki.1003-0069.001538.
- Yang, S., & Fang, X. (2023). A study on the visual expression of printing technique and paper used for Gaomi ash New Year's paintings. *Decoration*, (7), 34-39. doi:10.16272/j.cnki.cn11-1392/j.2023.07.017.
- Yeh, S. (2022). A morphological study on the decoration of Majiayao coloured pottery pots based on shape grammar: the frog pattern as an example. *Ceramic Research*, 37(1), 29-31. doi:10.16649/j.cnki.36-1136/tq.2022.01.017.
- Zhang, H., Zhou, S., Ning, X., & Ling, Y. (2025). A study on redesign of Qiandongnan Miao fish pattern based on topological semantics and shape grammar. *Journal of Packaging*, 17 (2), 40-48. doi:10.20269/j.cnki.1674-7100.2025.2004.
- Zhang, M., & Park, Y. (2025). A study on the regeneration design and application of Han Dynasty Yunqi pattern based on shape grammar. *Furniture and Interior Decoration*, 32(3), 110-116. doi:10.16771/j.cn43-1247/ts.2025.03.017.
- Zhang, P. (2024). Design and application of blue printed fabric pattern reconstruction based on shape grammar. *Journal of Jiangsu Engineering Vocational and Technical College*, 24(4), 42-49. doi:10.19315/j.issn.2096-0425.2024.04.008.
- Zhang, S., & Fan, Y. (2024). Research on the innovative design of Chinese traditional patterns based on shape grammar--The example of Huayao picking flower. *Journal of Jilin College of Arts*, (4), 32-38. doi:10.13867/j.cnki.1674-5442.2024.04.004.
- Zhao, Y. (2023). Exploring the current situation of intangible cultural heritage of ceramic coloured Gaomi ash New Year's Paintings. *Ceramic Science and Art*, 57(4), 81. doi:10.13212/j.cnki.csa.2023.04.012.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of KIHSS and/or the editor(s). KIHSS and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.