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Research paper



Research on Applying Design Elements of The Traditional Ming Dynasty Fauteuil to Chinese-Style Chairs

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Abstract

The Taishi chair represents the pinnacle of Chinese furniture design, recognized worldwide and influencing furniture styles across multiple countries. However, due to shifts in societal, temporal, and ideological factors, China has introduced the concept of "Chinese-style furniture" to meet contemporary lifestyle demand. Despite over two decades of development, Chinese-style furniture has yet to achieve significant global influence, largely because it fails to fully embody China's cultural heritage. While prior research has explored integrating Taishi chair elements into furniture, no systematic methodology exists for combining these elements with Chinese-style chairs. This study addresses this gap through the following approach: First, it analyzes and categorizes Taishi chair design elements to identify their distinctive features. Second, it examines design shortcomings in existing Chinese-style chairs through market research. Third, it extracts and adapts traditional Taishi chair motifs. Finally, it develops four Chinese-style chair designs inspired by the themes of mountain, water, cloud, and moon, evaluating their feasibility through consumer purchase intent surveys.

Keywords: *Ming Dynasty, Traditional Fauteuil, Design Elements, Chinese-Style Chair, Application*

1. Introduction

1.1 Research Background and Necessity

The Fauteuil, a significant representative of traditional Chinese furniture, embodies both utility and artistry and has a long history with profound cultural significance (Zhang Hengshan, 2021). It carries a wealth of national spirit, showcasing the wisdom and craftsmanship of ancient Chinese furniture-making at its highest level.

Due to its intricate materials and unique craftsmanship, the fauteuil has developed slowly within a mechanized, mass-production environment Yujia, Ye Xi,2017）. With the rising consumption levels and evolving consumer preferences in China, there has been a growing demand for culturally rich Chinese-style chairs. Designers are actively responding to these market changes by experimenting with diverse materials, colors, and forms to develop Chinese-style chairs that meet the stylistic needs of contemporary living spaces (Ye Cong, 2011）.

Integrating the design elements of Taishi chairs into Chinese-style seating, while incorporating modern production techniques and aesthetic considerations, forms a critical pathway for traditional innovation. This blended approach not only preserves cultural heritage but also fulfills contemporary consumers' multifaceted expectations for comfort, functionality, and cultural identity (Yang Qian, 2016).

1.2 Research Objectives

By integrating the design elements of Taishi chairs with contemporary Chinese-style chair designs, this study aims to scientifically apply these traditional motifs to modern furniture creation. The research seeks to propose innovative approaches for incorporating Taishi chair elements into Chinese-style designs, address current limitations in their development, resolve challenges in promoting traditional cultural elements through contemporary furniture, enhance both design and production quality to attract broader consumer groups, and stimulate academic attention to the methodological application of Taishi chair design elements.

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1.3 Research Designs

1.3.1 Literature Review Method

This study reviews literature on traditional Ming Dynasty fauteuils and contemporary Chinese-style chairs, focusing on their form and symbolic elements. To contextualize the methodology, it also considers international approaches, such as Japanese minimalist furniture, which integrates tradition through simplicity and material purity, and Scandinavian design, which blends heritage with modern function.

2. Theoretical Examination

2.1 The Types of Traditional Ming Dynasty Fauteuils in China

Chinese Ming Dynasty chairs, as classics in the history of Chinese furniture development, have been passed down through generations, primarily due to their distinctive design style. There were many representative types of Fauteuils during the Ming Dynasty in China, with the following main types appearing chronologically: the circle chair, the folding chair, the armchair, and the high-back chair.

Table 1: Representative Types of Fauteuils

Circle Chair	Folding Chair	Armchair	High-Back Chair
			

2.2 Element Analysis

2.2.1 Structure

The tenon-and-mortise joint is the primary structural method in ancient Chinese architecture, furniture, and other artifacts. It involves connecting two components using a protruding part (the tenon) that fits into a corresponding recess (the mortise), known as the mortise hole or mortise slot.

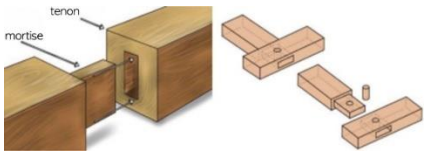


Fig. 1: Tenon-and-mortise

2.2.2 Form

The headrest is a distinctive feature of Fauteuils compared to other chairs, located at the uppermost horizontal beam. It is so named because it supports the head when reclining backward. Functionally, the backrest panel meets ergonomic needs, while decoratively, it exhibits aesthetic appeal through a combination of lines and points. Waistline Apron: The waistline apron not only provides a highly decorative effect but also enhances the strength of the seat panel and support frame. The legs and feet are crafted from solid wood, either with square or round cross-sections. Leg designs vary, including upright or splayed forms, with optional stretchers connecting the legs for added stability or decorative simplicity.

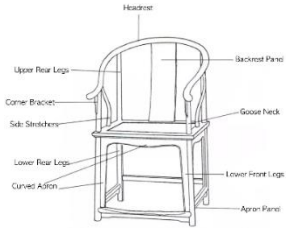


Fig. 2: Component Diagram

2.2.3 Materials

Rosewood and similar deep-toned woods are classified as black wood. Lighter-colored woods like huanghuali and wenge fall under the yellow wood category. Red-colored woods, which appeared later than rosewood and pearwood, are grouped as red wood. Woods of other hues are categorized as white wood. Additionally, based on their density and hardness, woods are further divided into hardwood and softwood classifications.

2.2.4 Motifs

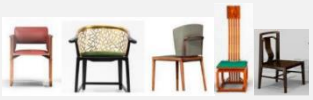
Common decorative Motifs found on traditional Ming Dynasty armchairs include animal motifs, human motifs, plant motifs, object motifs, scenic motifs, geometric motifs, and text motifs. These Motifs express auspicious meanings through traditional symbolic methods and rich spiritual connotations.

3. Design Survey Content

3.1 Analysis of the Current State of Chinese-Style Chairs

In recent years, many Chinese-style chair brands have emerged on the market. Below are some common chair brands. These brands have products available for sale in the market.

Table 2: Chinese-Style Seating Brands

Category	Related Works
Traditional Rosewood Furniture Transformation to Modern Chinese Style	
Sub-Brands of Modern Enterprises	
Designer (Studio) Brands	

3.2 Analysis of Existing Problems

3.2.1 Form Issues

Chinese-style design aims to break the cold and mechanical feel of Western chairs by incorporating traditional Chinese cultural elements. However, the inclusion of traditional seating forms in the design often restricts the freedom of the design process, resulting in a relatively conservative outcome that lies between tradition and modernity. The traditional elements and symbols are scattered within the concept of traditional culture and directly added to the shape of traditional chairs. Excessive imitation of traditional Ming-style Fauteuils can lead to a disconnection between the product and its surrounding environment.

3.2.2 Market Issues

While Chinese-style chairs can pursue beautiful appearances, the materials' processing techniques are often too monotonous, preventing them from meeting practical needs. Additionally, the lack of a comprehensive marketing strategy has severely limited their development. In chair design, many designers focus on the value and texture of materials but overlook the design of the chair's shape, thus greatly reducing the market competitiveness of Chinese-style chairs.

3.2.3 Cultural Issues

In Chinese-style chair design, the essence of traditional Chinese culture has faded, and most designers have adopted Westernized designs, abandoning traditional elements. However, they have not truly grasped the core ideas conveyed by Western culture; instead, they blindly follow trends.

3.2.4 Environmental Issues

When people place their favorite traditional chairs in modern spaces, they often find these pieces out of harmony with the surrounding environment. Additionally, the homogeneity of Chinese-style chairs limits their adaptability, failing to meet the diverse needs of modern lifestyles.

3.3 Survey on Consumers

This consumer demand survey for Chinese-style chair products collected a total of 500 valid questionnaires through both online and offline distribution. The respondents were women aged 20 to 57 and above, residing in second-tier cities, with the majority being office workers. The survey results indicate that they prefer armchairs as the design prototype and suggest developing Chinese-style chairs based on five key indicators: patterns, colors, form, functionality, and materials.

3.3.1 Survey Methodology

A stratified sampling method was used to ensure diverse representation across age groups and occupations among women in second-tier Chinese cities. The final sample included 500 valid responses collected via both online platforms and paper-based surveys at cultural events.

The questionnaire included closed-ended and Likert-scale items covering chair preferences (e.g., motifs, colors, form, materials). It was pilot-tested with 30 participants for clarity. Internal consistency was confirmed with a Cronbach's alpha of 0.87. Basic descriptive statistics were used to analyze responses. Chi-square tests assessed relationships between demographics and preferences, and 95% confidence intervals were calculated for key findings.

4. Design and Development

4.1 Motif

The author applied methods such as simplification, abstraction, decomposition, and recombination to extract the motifs of mountains, water, clouds, and moons in the ornamental designs of the traditional Ming-style fauteuil.

Table 3: Mountain Series Motif Extraction

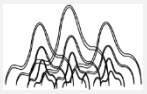
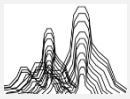
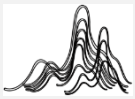
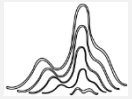
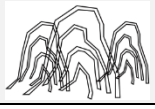
Extraction Process of Mountain Motifs		
		
Overlapping	Repetition	Variation
		
		
		
		

Table 4: Water Series Motif Extraction

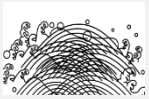
Extraction Process of Water Motifs		
		
Simplification	Repetition	Variation
		
		
		
		

Table 5: Cloud Series Motif Extraction

Extraction Process of Cloud Motifs		
		
Decomposition	Variation	Repetition
		
		

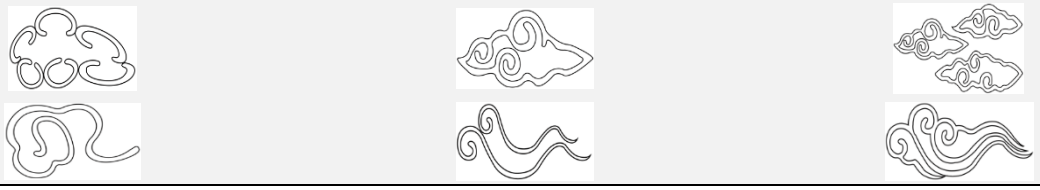


Table 6: Moon Series Motif Extraction

Extraction Process of Moon Patterns		
		
Simplification	Variation	Recomposition
		
		
		
		

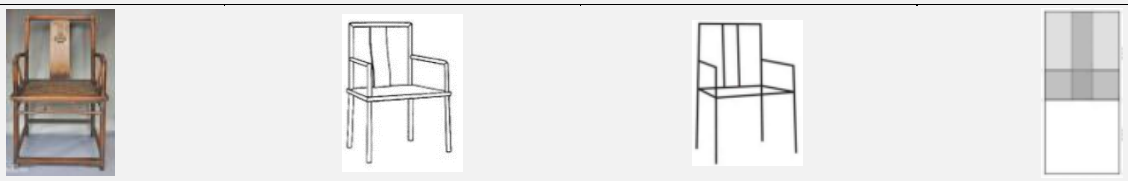
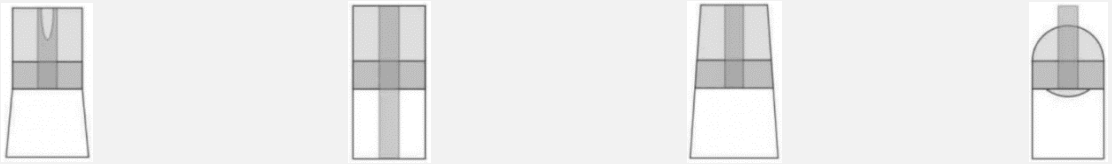
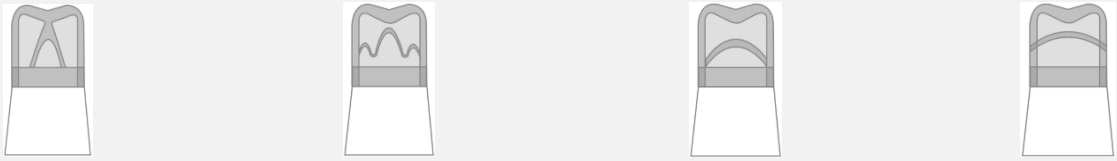
4.2 Color

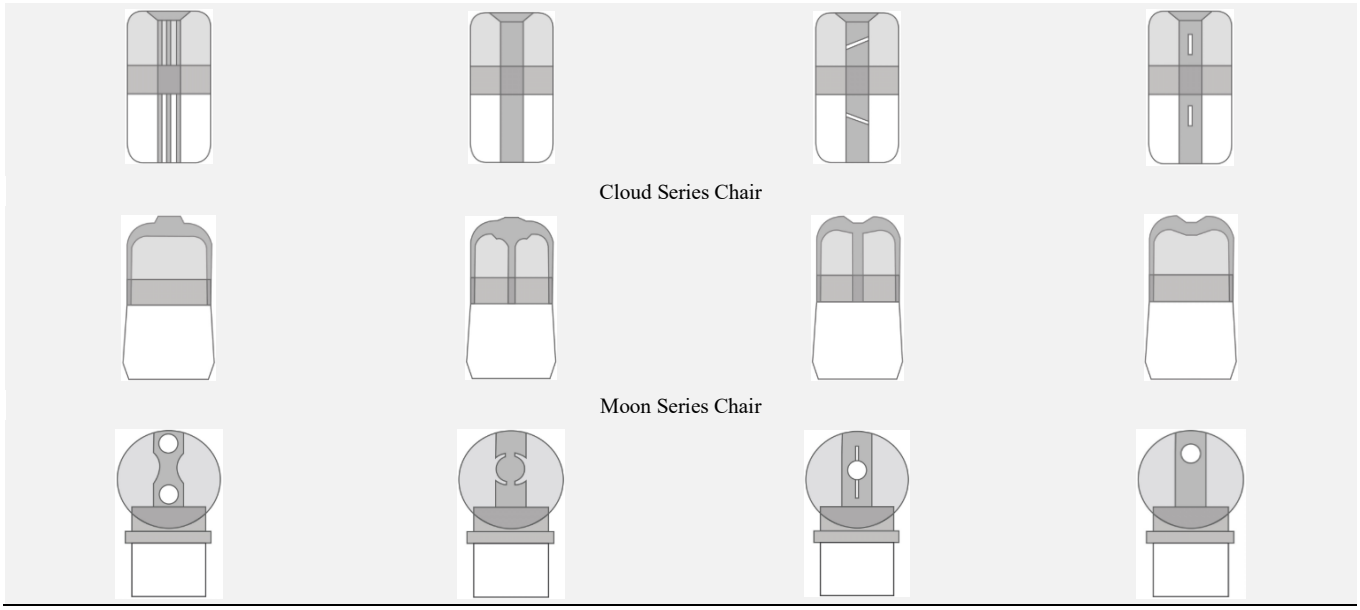
Based on the principles of color design, in addition to the wood colors, consumers favor black, white, and gray as the three most popular colors, which are commonly found in market products and are considered neutral tones.

4.3 Form

Taking the traditional armchair from the Ming Dynasty as a representative example, the design process involves abstracting and simplifying the original structure by removing excessive decorative elements, while retaining the essential framework of the chair.

Table 7: Abstract extraction process for armchair prototype

Abstract extraction process for armchair prototype

Chinese-style Chair Design Topology Evolution

Mountain Series chairs

Water Series Chairs



Cloud Series Chair

Moon Series Chair

As illustrated below, the topological evolution of the chair, combined with contemporary geometric design principles, enriches its form. This design thinking process can be used as a reference to quickly and effectively define the overall shape of the chair.

4.4 Function

Added functions of chairs offer more convenience to users and save costs. For example, Chinese chairs can achieve multifunctionality by integrating different usage needs, employing methods such as combination, rotation, and extension.

4.5 Materials

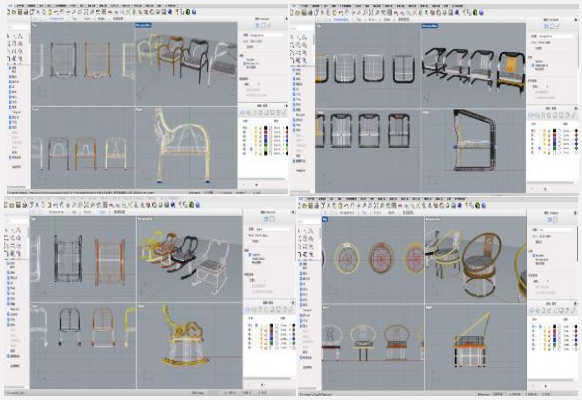
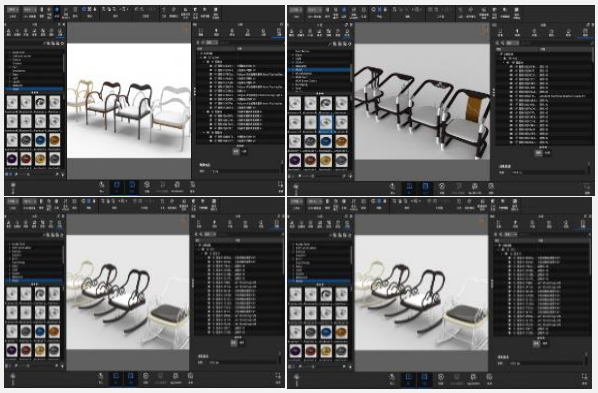
Modern furniture design increasingly incorporates composite materials such as metal, plastic, resin, acrylic, and engineered wood. These materials not only allow for innovative design but also require careful evaluation in terms of durability, sustainability, and user safety. Studies such as Liu Ning (2018) highlight the application of non-traditional materials in Chinese furniture, noting their role in enhancing aesthetic diversity and performance.

To align with applied science, these materials can be tested using standardized protocols such as ISO 7170 (strength tests for storage furniture) or ASTM D790 (flexural properties of plastics). Assessing material fatigue, load-bearing capacity, and environmental impact enables designers to meet both aesthetic and functional requirements while ensuring long-term usability.

4.6 Design and Development

Table 8: Design and Development of the Mountain Series Chair

Motifs	
① Hand-drawn Sketch	② Dimensioned Drawing
③ Rhino Modelling	④ KeyShot Rendering

Completed Design of the Mountain Series








Design Description

The mountain motif embodies steadfast stability. The backrest features a 15° golden-angle mountain curve, meticulously engineered based on anthropometric data of Asian adults' spinal curvature to perfectly align with the natural lumbar arch. The seat combines premium Italian full-grain leather with high-density memory foam, utilizing a triple-layer gradient density design to reduce ischial tuberosity pressure by 22%.

Table 9: Design and Development of the Water Series Chair

Motifs






Completed Design of the Mountain Series



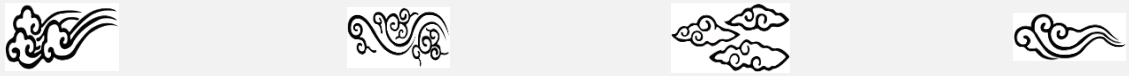





Design Description

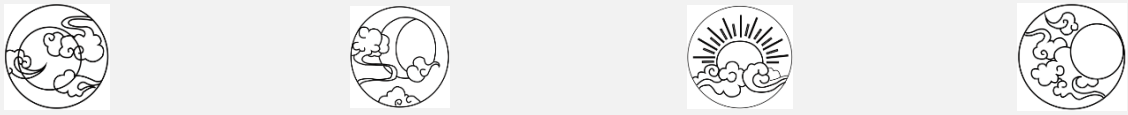
Water symbolizes resilience and vitality. The fluid beauty of water transforms into scientific ergonomic design. The 15° wave-shaped backrest, meticulously crafted based on anthropometric data of Asian adults' lumbar curvature, perfectly conforms to the natural spinal alignment.

Table 10: Design and Development of the Cloud Series Chair

Motifs

Completed Design of the Mountain Series

Design Description
The cloud motif symbolizes auspiciousness and freedom. The backrest's 12° cloud-inspired curve perfectly conforms to the natural spinal curvature, while cloud-shaped armrests paired with a rocking base seamlessly blend traditional aesthetics with modern technology.

Table 11: Design and Development of the Moon Series Chair

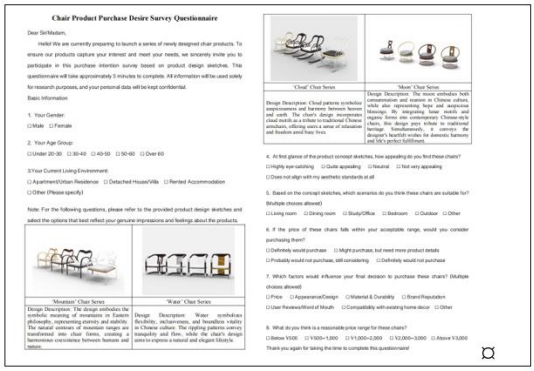
Motifs

Completed Design of the Mountain Series

Design Description
The full moon embodies reunion and tranquility. Its circular silhouette forms a 15° golden-angle backrest that cradles the spine, optimized for Asian body types, while the solid base provides steadfast support - conveying lunar harmony. A perfect synthesis of traditional aesthetics and modern ergonomics.

5. Conclusion

5.1 Consumer Purchasing Desire Survey

To verify whether the four designed chairs—representing the themes of Mountain, Water, Cloud, and Moon—meet consumer needs, a consumer preference survey was conducted. The survey provided detailed explanations of the design concepts and features of the products. A total of 312 questionnaires were collected, of which 304 were valid, yielding a response rate of 97.44%. The statistical analysis of the survey results is as follows: The survey results indicate that female consumers constitute the majority, totaling 195 respondents and accounting for 64.14% of the total.



Chair Product Purchase Desire Survey Questionnaire

Dear Sir/Madam,

Hello! We are currently preparing to launch a series of newly designed chair products. To ensure our products capture your interest and meet your needs, we sincerely invite you to participate in this purchase intention survey based on product design sketches. This questionnaire will take approximately 5 minutes to complete. All information will be used solely for research purposes, and your personal data will be kept confidential.

Basic Information

1. Your Gender:
□Male □Female

2. Your Age Group:
□Under 20 -30 □30-40 □40-50 □50-60 □Over 60

3.Your Current Living Environment:
□Apartment/Urban Residence □Detached House/Villa □Rented Accommodation
□Other (Please specify)

Note: For the following questions, please refer to the provided product design sketches and select the options that best reflect your genuine impressions and feelings about the products.

'Mountain' Chair Series

Design Description: The design embodies the symbolic meaning of mountains in Eastern philosophy, representing eternity and stability. The natural contours of mountain ranges are transformed into chair forms, creating a harmonious coexistence between humans and nature.

'Water' Chair Series

Design Description: Water symbolizes flexibility, inclusiveness, and boundless vitality in Chinese culture. The rippling patterns convey tranquility and flow, while the chair's design aims to express a natural and elegant lifestyle.

'Cloud' Chair Series

Design Description: Cloud patterns symbolize auspiciousness and harmony between heaven and earth. The chair's design incorporates cloud motifs as a tribute to traditional Chinese aesthetics, offering users a sense of relaxation and freedom amid busy lives.

'Moon' Chair Series

Design Description: The moon embodies both consummation and reunion in Chinese culture, while also representing hope and auspicious blessings. By integrating lunar motifs and circular forms into the backrests and bases of the chairs, this design pays tribute to traditional heritage. Simultaneously, it conveys the designer's heartfelt wishes for domestic harmony and life's perfect fulfillment.

4. At first glance of the product concept sketches, how appealing do you find these chairs?
□Highly eye-catching □Quite appealing □Neutral □Not very appealing
□Does not align with my aesthetic standards at all

5. Based on the concept sketches, which scenarios do you think these chairs are suitable for? (Multiple choices allowed)
□Living room □Dining room □Study/Office □Bedroom □Outdoor □Other

6. If the price of these chairs falls within your acceptable range, would you consider purchasing them?
□Definitely would purchase □Might purchase, but need more product details
□Probably would not purchase, still considering □Definitely would not purchase

7. Which factors would influence your final decision to purchase these chairs? (Multiple choices allowed)
□Price □Appearance/Design □Material & Durability □Brand Reputation
□User Reviews/Word of Mouth □Compatibility with existing home decor □Other

8. What do you think is a reasonable price range for these chairs?
□Below ¥500 □¥500~1,000 □¥1,000~2,000 □¥2,000~3,000 □Above ¥3,000

Thank you again for taking the time to complete this questionnaire!

Fig. 3: Survey on Consumers' Propensity to Purchase

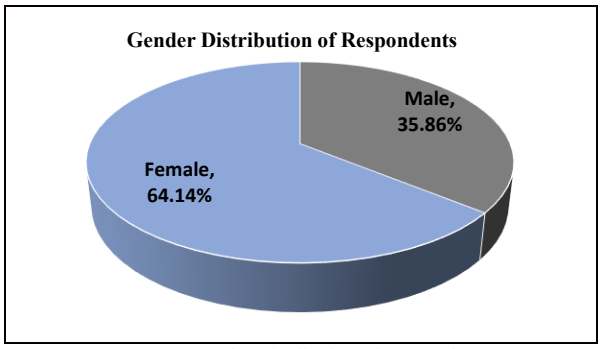


Fig. 4: Gender Distribution of Respondents

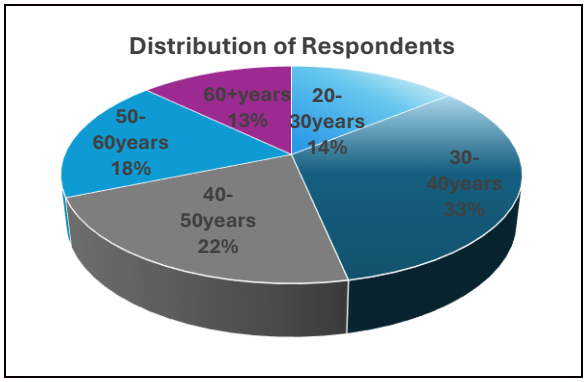


Fig.5: Distribution of Respondents

In terms of age distribution, the 30-40 age group represents the largest proportion, reaching 32.57%.

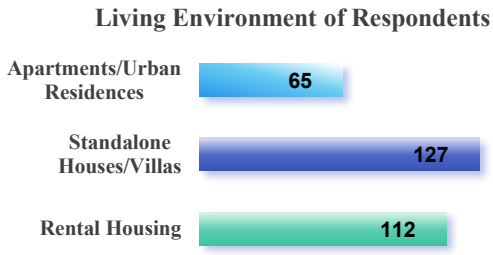


Fig. 6: Product Attractiveness Statistics

Regarding living environments, respondents residing in independent houses make up the highest percentage at 41.78%.

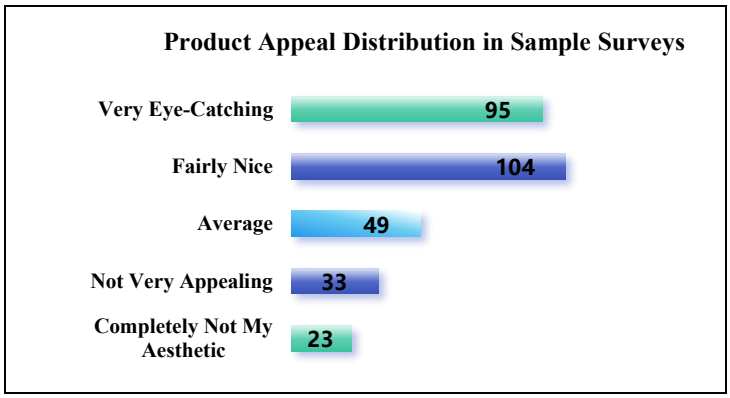


Fig.7: Product Attractiveness Statistics

Over 30% of consumers described the chair design as “very eye-catching.”

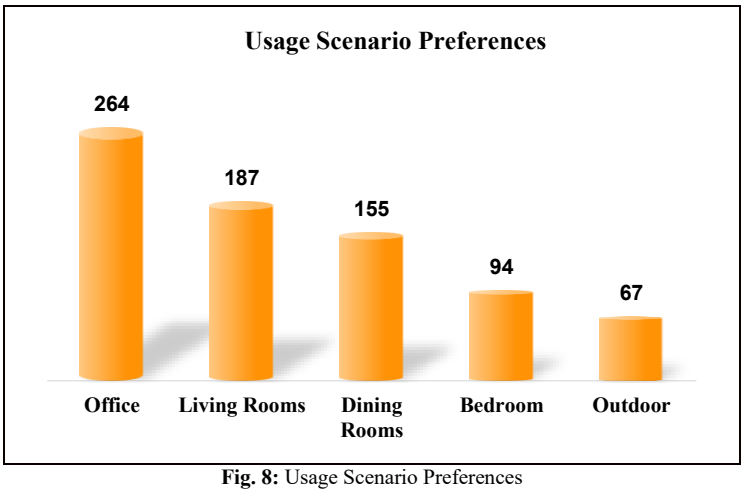


Fig. 8: Usage Scenario Preferences

For usage scenarios, 90% of respondents believe the chairs are suitable for office settings.

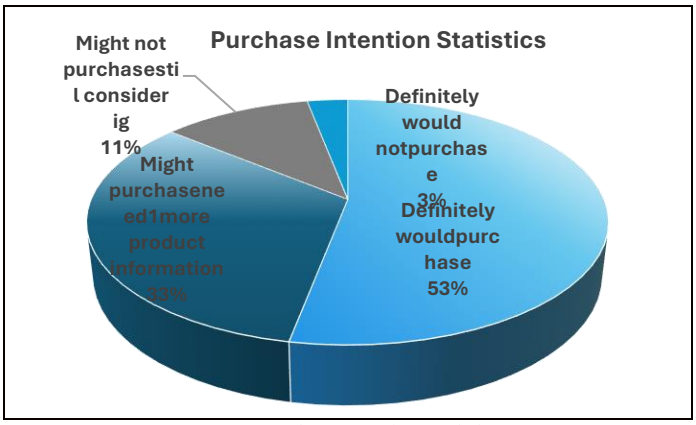


Fig. 9: Purchase Intention Statistics

More than half of the respondents (52.96%) stated that they would choose to purchase without hesitation, provided the price is reasonable. Based on the feedback, we can clearly identify the key factors influencing consumers' purchasing decisions: appearance design (87.83%) and material and durability (87.50%) are the two aspects most valued by respondents. From the data analysis, these results align closely with our expectations.

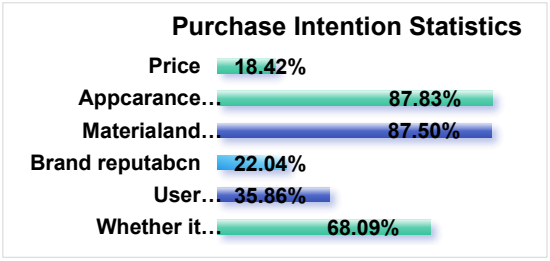


Fig. 10: Purchase Influencing Factors

In summary, through in-depth research and analysis, the chairs we designed have demonstrated strong market competitiveness in several key areas, fully meeting the diverse needs of consumers. The chair design not only possesses a high degree of market appeal but has also successfully stimulated consumer purchasing desire. This product design proposal is feasible.

5.2 Conclusion of the Study

Future work could explore the application of these designs in real-world contexts such as hotels, public waiting areas, and international home furnishing markets. Challenges such as mass production costs, material sourcing, and long-term durability must be addressed. Additionally, integrating sustainable materials and modular construction methods can enhance scalability. Researchers may also investigate ergonomic testing and cultural acceptance in non-Chinese contexts to broaden applicability.

Market research on consumers' purchasing intentions for the design proposals has demonstrated that traditional elements retain significant market value and cultural meaning in modern design. The conclusions can be summarized as follows:

5.2.1 Application and Inheritance of Traditional Elements

The design of Chinese-style chairs provides actionable methods for applying and inheriting traditional elements. These design developments not only offer insights into ways of preserving traditional elements but also reflect a unique understanding of "tradition." Tradition embodies national characteristics, and only by embracing the essence of traditional design elements can Chinese-style chairs gain global recognition.

5.2.2 Human-Centered" Design Approach

A human-centered design approach focuses on meeting the behavioral and psychological needs of people. While interpretations of "people" may vary, care for individuals remains at the heart of design. Beyond addressing universal physiological needs, Chinese-style chairs also emphasize personal requirements. This unique perspective on understanding "people" in Chinese-style chair design helps us reexamine human factors in our surroundings.

5.2.3 Design Development as the Pathway for Chinese-Style Chairs

In the competitive market landscape, Chinese-style chairs hold an important position, fundamentally requiring designs with distinctive Chinese characteristics. These designs must also align with consumer needs and expectations to ensure sustained development and relevance.

Author Contributions

Conceptualization, Zhu. W., and Han. S.; methodology, Zhu. W. and Han. S.; validation, Zhu.W.; and Han. S.; formal analysis, Zhu. W., and Han. S.; data curation, Zhu. W. and Han. S., writing—original draft preparation, Han. S., writing—review and editing, Han. S.; visualization, Zhu. W.; All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The anonymized data that support the findings of this study are available on request from the corresponding author.

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The data are not publicly available due to information that may compromise the participants' privacy.

Conflicts of Interest

The authors declare no conflicts of interest.

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