

Practical Exploration and Research Review of Color Psychology in Garment Visual Design

Cai Zhenzhen*

School of Architecture and Art, Guangzhou Nanyang Polytechnic College, Guangzhou, 510925, China

87637963@qq.com

**corresponding author*

Abstract: *As the core constituent element of garment visual language, color serves as the primary visual carrier for aesthetic emotion transmission, product style shaping and cognitive guidance of consumption, and possesses powerful psychological suggestion and sensory guiding functions. As an interdisciplinary subject connecting visual aesthetics, cognitive psychology and design practice, color psychology can scientifically explain the mechanism of how color affects audience emotional perception, aesthetic experience, consumption decision-making and identity recognition, providing theoretical basis and quantitative guidance for modern garment visual design. To systematically clarify the application logic, practical status, functional mechanism and existing bottlenecks of color psychology in the field of garment design, this paper adopts the literature review method, comparative analysis method and inductive deductive method to construct a complete research system from six dimensions, including the theoretical basis of color psychology, the application status of garment color design, the core mechanism of psychological empowerment, differentiated scenario application comparison, practical dilemmas of design, and optimized practical paths. By sorting out the existing academic achievements and industrial practical cases, this study systematically deconstructs the conduction path of hue, lightness, saturation and collocation relationship of colors on audience psychological perception, and compares the psychological adaptation differences under diverse color collocation modes, different consumer groups and various garment scenarios. It summarizes prominent problems in current garment color design, including empirical design, low color-psychological adaptation, ambiguous scenario matching, serious homogenization and superficial emotional expression. The research indicates that modern garment visual design has transformed from traditional empirical color matching to a psychology-driven scientific and precise color matching system. The in-depth application of color psychology can effectively improve the visual appeal, emotional added value and market adaptability of garments. Based on the existing industrial pain points, this paper proposes hierarchical, classified and scenario-based optimization strategies for color design, which can provide theoretical support and practical reference for modern garment visual innovation, personalized color design and the construction of visual systems for apparel brands.*

Keywords: *color psychology; garment visual design; color matching system; visual communication; psychological perception; design innovation*

1. Introduction and Research Review

1.1 Research Background and Significance

Against the background of a fashion industry dominated by visual consumption, the market competition of garment products has evolved from the competition of version and craftsmanship to the comprehensive competition of visual aesthetics, emotional experience and cultural value. As the primary element of garment visual perception, color has stronger visual impact and communication penetration compared with fabric, version and craftsmanship. It can trigger audience sensory cognition and emotional feedback in a short time, becoming the core breakthrough for the innovation of garment visual design. With consumption upgrading and the refinement of public aesthetics, modern consumers' demands for garments are no longer limited to wearable functionality, but focus more on the emotional experience, identity expression and aesthetic resonance brought by garment colors. The traditional color matching mode relying on designers' subjective experience can no longer adapt to the refined, personalized and scenario-based needs of modern garment design^[1].

Based on cognitive psychology, visual aesthetics and sensory science theories, color psychology reveals the influence rules of different color attributes, color collocations and color tones on human emotions, cognition and behavioral decision-making, which can provide a scientific, systematic and accurate theoretical support for garment color design.

Systematic exploration of the empowerment mechanism and practical path of color psychology in garment visual design can effectively solve industrial pain points such as empirical and homogenized color matching, vague emotional expression and poor scenario adaptation, and promote the transformation of garment color design from "empirical aesthetics" to "scientific aesthetics". The research results can be directly applied to the visual design practice of women's wear, men's wear, children's wear, occupational wear and trendy apparel, possessing important theoretical research significance and industrial application value.

1.2 Research Status at Home and Abroad

Foreign research on color psychology started early and has formed a mature theoretical system and empirical research paradigm. At the basic theoretical level, foreign scholars have constructed the sensory cognition theory of color hue, lightness and saturation, and clarified the emotional and psychological mechanisms corresponding to warm and cold tones, light and dark tones, contrast and harmony colors. At the applied research level, studies focus on the application of color in visual communication, product design, fashion apparel and consumer behavior, and quantify the impact of color on audience emotion, preference and purchase intention through empirical experiments, forming a scientific and data-based color application paradigm. Foreign research focuses on quantitative empirical analysis and psychological mechanism interpretation with a complete theoretical system, but lacks in-depth research on the adaptation of Chinese consumers' aesthetic preferences, local apparel styles and national trend apparel systems^[2].

Domestic academia has carried out extensive research on garment color design, and the existing achievements are mainly concentrated in three dimensions: the visual effect research of single color or color collocation in apparel design; the analysis of color aesthetic characteristics of specific style garments; and the correlation research between color aesthetics and consumer preference. Existing studies have verified the important value of color psychology in garment visual expression and market application, but there are still obvious deficiencies. Most studies remain at the level of visual phenomenon description, lacking in-depth deconstruction of psychological conduction mechanisms. The research results are fragmented, failing to form a systematic color psychological empowerment design system. In addition, there is a lack of differentiated comparative analysis of diverse scenarios, crowds and color matching modes, making it difficult to form a universal and implementable garment color design paradigm.

1.3 Research Contents and Innovations

Taking the practical application of color psychology in garment visual design as the core research object, this paper constructs an integrated six-dimensional research framework of "theoretical basis – application status – core mechanism – differential comparison – practical dilemmas – optimization paths", and systematically sorts out the integration logic and practical rules of color psychology and garment visual design. The research innovations of this paper are mainly reflected in two aspects. Firstly, a closed-loop conduction mechanism model of color psychology empowering garment visual design is constructed, which deconstructs the empowerment mechanism from four levels: sensory stimulation, emotional arousal, emotional identity and behavioral guidance, making up for the defects of ambiguous mechanism and scattered system in existing studies. Secondly, two groups of differentiated comparison tables are set to quantify the psychological adaptation differences and design advantages and disadvantages of different color matching modes and application scenarios, and propose hierarchical and classified accurate color matching strategies, providing precise practical guidance for scientific color design of modern garments^[3].

2. Theoretical Basis of Color Psychology and Its Application Status in Garment Design

2.1 Core Theoretical System of Color Psychology

Color psychology is an interdisciplinary subject that studies the correlation between color visual stimulation and human psychological perception, emotional changes and cognitive behaviors. Its core theories include color attribute theory, color cold-warm theory, color contrast and harmony theory, and color emotional association theory. In terms of basic color attributes, hue determines the emotional tone of color, lightness affects the visual weight and permeability, and saturation defines the advanced sense and emotional saturation of color. From the perspective of visual psychological rules, cool tones convey psychological feelings of calmness, restraint and rationality, while warm tones deliver emotional experiences of warmth, vitality and gentleness. In terms of color matching logic, contrasting colors strengthen visual impact and adapt to trendy and personalized styles, while analogous colors and monochromatic systems weaken visual conflicts and are suitable for minimalist, high-end and commuter elegant styles. Overall, color can directly act on human subconscious cognition through visual sensory input, forming stable emotional association and aesthetic preference, which constitutes the scientific basis for garment color design.

2.2 Compatibility Logic of Color Psychology and Garment Visual Design

The core goal of garment visual design is to shape styles, convey emotions and fit audience aesthetics and scenario demands through visual language, while the core function of color psychology is to realize the accurate matching of visual stimulation and psychological emotion, and the two have a high internal compatibility. Firstly, color is the primary element of garment style shaping, and different color tones can quickly define the style characteristics of garments such as light luxury, minimalism, retro, trend and formality. Secondly, color endows garments with emotional connotations, breaking the single wearable function of garments and realizing emotional resonance between apparel and human beings. Finally, color psychology can accurately match the aesthetic needs of different crowds and diverse scenarios, realizing the personalized and scenario-based implementation of garment visual design, and serving as the core support for the refined design of modern garments.

2.3 Overall Application Status of Modern Garment Color Design

In the field of domestic modern garment visual design, color has become the core breakthrough of design innovation, and the application of color psychology has initially penetrated into the whole fields of apparel design, brand vision and terminal collocation. In terms of application advantages, most leading apparel brands have abandoned the messy and stacked color matching modes and tried to carry out minimalist, high-end and scenario-based color design based on public aesthetic psychology. In terms of existing problems, most small and medium-sized designers and brands still rely on subjective experience and trend following, lacking scientific application of color psychological rules, resulting in inappropriate color matching, vague emotional expression, scenario adaptation dislocation and serious homogenization. On the whole, the industry is in a critical stage of transformation from empirical color matching to scientific color matching, and the systematic application of color psychology still has great room for improvement^[4].

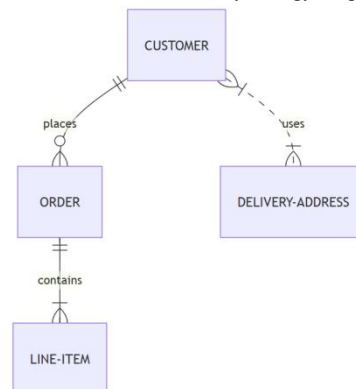
2.4 Era Value of Color Psychology Empowering Garment Design

Under the background of high-quality development of fashion industry and refined aesthetic upgrading, the practical application of color psychology has three core values. At the design level, it can standardize the logic of garment color matching, avoid subjective and arbitrary design, and improve the visual beauty and emotional texture of garments. At the market level, it can accurately match consumers' psychological preferences, and enhance the aesthetic adaptability and market conversion rate of products. At the industrial level, it can promote the standardization, scientization and systematization of garment visual design, break the homogenization dilemma of color matching in national trend, commuter and trendy apparel, and help apparel brands build differentiated visual competitive barriers.

3. Core Mechanism of Color Psychology Empowering Garment Visual Design

The empowerment of color on garment visual effect and audience psychology is not a single sensory stimulation, but a four-level closed-loop conduction process from visual input, emotional arousal and emotional identity to behavioral guidance. This paper constructs a core mechanism model of color psychology empowering garment visual design to fully deconstruct the internal logic of scientific color matching.

Figure 1 Core Conduction Mechanism Model of Color Psychology Empowering Garment Visual Design



3.1 Visual Sensory Stimulation Mechanism: Basic Visual Atmosphere Shaping

Visual sensory stimulation is the basic level of color psychological empowerment. The three core attributes of color (hue, lightness and saturation) directly determine the basic visual atmosphere of garments, and different attribute combinations form differentiated visual tension and sensory experience. High-lightness colors present a transparent, lightweight and youthful visual effect, suitable for young casual garments; low-lightness colors deliver a heavy, stable and high-end texture, adapting to commuter, light luxury and formal garments; high-saturation colors are bright and full with strong visual impact, applicable to trendy, stage and personalized garments; low-saturation colors are soft and elegant with durable visual perception, matching daily, minimalist and national trend garments. The contrast and harmony of color collocation further strengthen the visual atmosphere and form the differentiated basic visual tone of garments.

3.2 Emotional Arousal Mechanism: Audience Psychological and Emotional Regulation

Color has inherent functions of emotional arousal and psychological regulation, which can directly affect audiences' emotional state and psychological perception through visual cognition. Warm colors such as red, orange and yellow can arouse vitality, warmth and enthusiasm, relieve dullness, and are suitable for casual, festive and youthful garment design. Cool colors including blue, green and gray convey calmness, freshness and restraint, adapting to workplace, commuter and summer garment design. Achromatic colors (black, white and gray) are simple and versatile, presenting an advanced, neutral and stable temperament, which can be applied to full-scene basic garments. Scientific color collocation can accurately regulate the emotional atmosphere of garments and realize the precise matching of apparel style and audience emotion.

3.3 Emotional Identity Mechanism: Aesthetic Style and Self-Expression

With the upgrading of public aesthetics, garment color is no longer a simple decorative element, but a core carrier for consumers' self-style expression, identity positioning and aesthetic preference. Color psychology can accurately match the emotional needs of different groups: young groups prefer high-vitality and high-lightness colors to pursue personality and trend expression; mature groups tend to low-saturation and low-contrast colors to pursue elegant, stable and advanced visual texture; consumers who favor national trend aesthetics prefer traditional five-color system and Morandi national color tones to realize cultural aesthetic resonance. Reasonable color design can highly fit the visual style of garments with consumers' aesthetic cognition and emotional demands, forming stable aesthetic identity and brand preference^[5].

3.4 Scenario Adaptation Mechanism: Accurate Matching of Time and Scenario

The wearing scenario of garments determines the psychological adaptation standard of color, and color psychology can realize the accurate adaptation of garment color to seasons and usage scenarios. In terms of seasonal adaptation, bright and low-saturation cool tones are preferred in spring and summer to fit the relaxed and fresh seasonal psychology, while warm and low-lightness tones are adopted in autumn and winter to adapt to the warm and stable seasonal emotion. In terms of scenario adaptation, workplace scenarios favor simple low-contrast and neutral color systems to convey professional and rigorous perception; daily leisure scenarios adopt soft and rich color collocations to create a relaxed and comfortable atmosphere; ceremonial scenarios prefer high-texture and high-recognition color matching to highlight solemn and advanced visual effect. Scenario-based color adaptation thoroughly solves the problem of disconnection between garment color matching and application scenarios.

3.5 Consumption Guidance Mechanism: Market Decision-Making and Value Improvement

Color psychological perception directly affects consumers' purchase decisions and product value cognition. Scientific color collocation can improve the visual advanced sense, recognition and aesthetic durability of garments and reduce consumers' aesthetic fatigue. Differentiated color tones can shape unique product styles and enhance the emotional added value and brand recognition of garments. Compared with version design and craftsmanship, the visual attraction of color can quickly capture consumers' attention, improve product click rate and conversion rate, and serve as a low-cost and high-return innovative path for the market-oriented implementation of garment products.

4. Comparative Analysis on Differentiated Application of Garment Color Design

4.1 Comparative Analysis on Psychological Adaptation Effect of Mainstream Color Matching Modes

Different color matching modes present completely different visual effects, psychological perception, style adaptability and market application effects. To clarify the application boundaries, advantages and defects of various color matching methods, this paper conducts a comparative analysis on four mainstream color matching modes (monochromatic matching, analogous color matching, contrasting color matching and achromatic color mixing) from five dimensions including visual effect, audience psychological perception, applicable garment style, aesthetic durability and comprehensive application evaluation, providing a basis for the scientific selection of garment color design.

Color Matching Mode	Visual Effect	Audience Psychological Perception	Applicable Garment Style	Aesthetic Durability	Comprehensive Application Evaluation
Monochromatic Matching	Unified tone, soft layers, clean vision	Comfortable, relaxed, high-end, low visual pressure	Minimalist style, commuter style, light luxury style, daily national trend style	High, low risk of aesthetic fatigue	Highest universality, suitable for mass market with high fault tolerance
Analogous Color Matching	Rich layers, natural transition, harmonious tone	Elegant, gentle, healing and textured	Soft style, literary style, light retro style, daily women's wear	Relatively high, balancing layers and comfort	Balancing aesthetic feeling and comfort, the mainstream color matching for mid-end apparel
Contrasting Color Matching	Strong visual impact, high recognition, distinct personality	Vigorous, avant-garde, high visual excitement	Street trendy style, stage costume, niche designer style	Low, prone to aesthetic fatigue after long-term viewing	Extreme and niche style, only applicable to personalized segmented market
Achromatic Color Mixing	Minimalist and high-end, neat and highly inclusive	Calm, rational, restrained and versatile	Occupational wear, business formal wear, basic versatile wear	Extremely high, classic and timeless	Strongest commercial adaptability, suitable for all-age audiences

4.2 Comparative Analysis on Color Psychological Adaptation of Different Wearing Scenarios

The core value of garment color lies in serving scenario demands, and different wearing scenarios have essential differences in the psychological atmosphere, emotional tone and visual style of colors. This paper selects four core wearing scenarios including workplace commuting, daily leisure, formal ceremony and street trend, and constructs a scenario-based color psychological adaptation system through comparative analysis from five dimensions: core color tone, lightness and saturation characteristics, color matching logic, audience psychological demands and core design focus.

Wearing Scenario	Core Color Tone	Lightness and Saturation Characteristics	Color Matching Logic	Audience Psychological Demands	Core Design Focus
Workplace Commuting	Calm, neutral, elegant and restrained	Medium-low lightness, low saturation	Few-color matching, unified harmony, low contrast	Conveying professional, rigorous and steady occupational image	Weakening visual personality, strengthening professional texture and adaptability
Daily Leisure	Soft, healing and relaxed	Medium-high lightness, medium-low saturation	Multi-color soft collocation with rich layers	Pursuing comfortable, relaxed and stress-free emotional experience	Prioritizing psychological comfort while taking into account fashion atmosphere
Formal Ceremony	Solemn, high-end and elegant	Low lightness with high texture or high-lightness pure color	Minimalist two-color matching with high standardization	Highlighting identity texture, ritual sense and dignified temperament	Strengthening color high-end sense and visual solemnity

Wearing Scenario	Core Color Tone	Lightness and Saturation Characteristics	Color Matching Logic	Audience Psychological Demands	Core Design Focus
Street Trend	Distinctive personality, vibrant and avant-garde	High lightness, high saturation, strong light and shade contrast	Color clash matching, asymmetric color segmentation	Showing personality, trend attitude and self-style	Strengthening visual recognition and personalized expression

5. Practical Dilemmas of Color Psychology in Garment Visual Design

5.1 Empirical Design Thinking and Insufficient Implementation of Scientific Theories

Most current domestic garment color design still adopts traditional empirical thinking. Designers mostly carry out color matching based on personal aesthetic experience and fashion trend following, without systematic consideration of color psychology theories, visual perception rules and audience emotional needs. The strong subjectivity and arbitrariness in color design lead to inappropriate visual presentation, confused emotional tone and ambiguous style expression of some garments, which fail to accurately convey the corresponding aesthetic atmosphere and emotional value, resulting in insufficient scientificity and accuracy of color design^[6].

5.2 Ambiguous Scenario Adaptation and Mismatch of Color Psychology

The industry generally faces the problem of disconnection between color design and wearing scenarios, user groups and seasonal atmosphere. Some commuter garments adopt high-saturation and high-contrast trendy color matching, which violates the restrained and professional psychological demands of workplace scenarios; some daily leisure garments adopt dull and low-lightness color matching, causing visual depression and emotional tension and failing to meet consumers' demands for relaxed and comfortable wearing experience. The scenario matching dislocation splits the visual aesthetic value and practical value of garments, greatly reducing the market adaptability of products.

5.3 Prominent Homogenization and Superficial Emotional Expression

Under the fast fashion industry model, color copying and trend following are prevalent. Most brands converge on popular color systems and lack the construction of customized color systems based on brand positioning and target audience psychological preferences. Most garment color matching only realizes the basic visual decorative function, lacking in-depth emotional empowerment and psychological expression. The single color tone and vague emotional connotation fail to form differentiated visual styles and emotional memory points, leading to serious color homogenization in the market and weak core competitiveness of products.

5.4 Insufficient Audience Segmentation and Personalized Adaptation

Current garment color design mostly adopts universal and generalized color matching logic, lacking refined psychological segmentation of different groups divided by age, gender and temperament. There is insufficient exploration of color psychological differences among teenagers, young people and mature groups, and low differentiation of color matching systems for men's wear, women's wear, children's wear and middle-aged and elderly garments. It cannot meet the personalized and refined aesthetic and psychological needs of modern consumers, restricting the high-end and refined upgrading of garment products.

5.5 Lack of Systematic Standards and Imperfect Industrial Norms

At present, the garment color design industry has not formed standardized and systematic color matching specifications based on color psychology, and there is a lack of applicable color matching paradigms and implementation standards for diverse styles, scenarios and crowds. The quality of color design completely depends on designers' personal ability, resulting in uneven overall industrial design level. A scientific, replicable and iterative color design system has not been established, restricting the large-scale and standardized application of color psychology in the garment industry.

6. Research Conclusions, Optimization Paths and Development Prospects

6.1 Core Research Conclusions

Through systematic theoretical sorting, mechanism deconstruction, comparative analysis and dilemma induction, this paper systematically explores the practical application logic and development rules of color psychology in garment visual design, and draws four core conclusions. Firstly, the empowerment of color on garment visual design is a four-level closed-loop conduction mechanism, which shapes the visual style, emotional value and market adaptability of garments in an all-round way through visual sensory stimulation, emotional arousal, emotional identity and behavioral guidance, serving as the core scientific support for modern refined garment design. Secondly, there are significant psychological adaptation differences between different color matching modes and wearing scenarios. Monochromatic and achromatic color systems are suitable for mass daily and workplace scenarios, while contrasting color matching is only applicable to niche trendy scenarios, so differentiated and scenario-based accurate color matching is essential. Thirdly, current garment color design faces five core bottlenecks restricting high-quality upgrading: empirical dominance, scenario dislocation, serious homogenization, insufficient audience segmentation and lack of systematic standards. Fourthly, the core development logic of modern garment color design is "psychology-oriented demand, scenario-based adaptation and theory-supported science", realizing the fundamental transformation from empirical aesthetics to scientific aesthetics^[7].

6.2 Optimization Paths for Scientific Garment Color Design

Combined with the color psychological empowerment mechanism and existing industrial pain points, this paper constructs a five-dimensional optimization path to promote the accurate implementation of color psychology in garment visual design. Firstly, strengthen theoretical empowerment and reshape design thinking. Integrate the emotional rules of color hue, lightness and saturation into the garment color matching system, abandon subjective empirical design, and realize scientific color matching. Secondly, deepen scenario adaptation and construct scenario-based color matching paradigms. Establish exclusive color tones and matching logic for workplace, leisure, ceremony and trend scenarios to solve the problem of scenario dislocation. Thirdly, build differentiated color systems. Construct exclusive brand color visual systems based on brand positioning and target audience psychological preferences to break industrial homogenization. Fourthly, refine audience segmentation and carry out personalized color design. Customize color matching schemes according to the psychological characteristics of groups of different ages and genders to improve product refinement. Fifthly, establish industrial standardized color matching specifications, form replicable and iterative color design systems, and promote the standardized development of the garment visual design industry.

6.3 Development Trend Prospect of the Industry

The application of color psychology in garment visual design will present three major development trends in the future. Firstly, refined color design. With the refinement of public aesthetics, accurate color matching based on audience psychology, scenario demands and seasonal atmosphere will become the industrial mainstream, completely replacing empirical trend-following design. Secondly, branded color system construction. Leading apparel brands will build exclusive brand color psychological systems, shape brand visual identification symbols through differentiated color tones, and form core competitive barriers. Thirdly, in-depth emotional empowerment. Garment color will evolve from simple visual decoration to in-depth emotional empowerment, realizing emotional resonance between apparel and users through color psychological regulation, and promoting the transformation of garment consumption from functional consumption to emotional and experiential consumption^[8].

6.4 Research Limitations and Future Research Prospects

As a theoretical review research, this paper focuses on systematic system sorting, mechanism deconstruction and current situation induction, without quantitative empirical analysis and special research on segmented apparel categories. Subsequent research can adopt empirical methods such as eye movement experiments and questionnaire surveys to quantify the weight of psychological influence of different color collocations. Meanwhile, special color design research can be carried out on segmented categories such as women's wear, children's wear and occupational wear to further refine the adaptive design paradigm, providing more accurate data support and practical guidance for the innovative application of color psychology in garment visual design.

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