Consumer Preferences for Patchwork Techniques in Sustainable Fashion: A Conjoint Analysis

Chuqiao Tan

Shishi High School Beihu Campus, Chengdu, China
18620676229@163.com

Abstract. In today's era, more and more consumers are beginning to pay attention to the environmental protection of products. Through the form of a questionnaire, this paper determines the patchwork clothing as the research object. Patchwork clothing recycles old fabrics and freely arranges and combines cloth pieces of different patterns, colors, shapes, and sizes to make different styles of clothing. After purchasing spliced clothing, consumers can also increase or decrease the number of pieces to make the size of the clothes more suitable for them. At the same time, consumers can also, through the free combination of clothing items, have different styles of clothing so as to reduce the frequency of consumers buying new clothes to achieve environmental protection. Therefore, the following discussion of this article will focus on patchwork clothing

Keywords: Consumer Preferences, Conjoint Analysis, Patchwork Techniques, Sustainable Fashion

1. Introduction

With the development of The Times and the progress of science and technology, environmental protection is becoming more and more important in various industries, especially in the field of fashion. The clothing industry is transforming to adapt to changing consumer preferences. In order to meet the changing preferences of consumers, the apparel industry now needs to develop a type of clothing that is both environmentally friendly and fashionable. However, at the same time, fewer clothing brands are positioned as fashion and environmental protection, and they are mainly from overseas. This includes brands such as Patagonia, Stella McCartney, and Eileen Fisher. These brands highlight fashion through a variety of styles and colors and use recyclable materials to highlight environmental protection, but the downside of doing so is the uniformity of form. In this paper, through the re-innovation of these clothes, the patchwork of different colors and patterns is arranged in different combinations by using the form of splicing to highlight its fashion. At the same time, the cloth can be used several times to highlight its environmental protection.

How many people are willing to buy this type of splicing fashion, whether this type of design is in line with consumers' preferences, and what factors will affect consumers' choice of splicing fashion become the first questions to be considered in this article. So this article uses the way of making a survey and selects a part of consumers to fill in and choose, so as to draw some conclusions. In the investigation of this article, there are three similar stores, and the influencing

factors are the price, the number of pieces of fabric that the clothing is made of, and the size of the clothing. In this paper, different permutations are listed to form 90 tables, ten groups of people are selected as the research object of this article, and finally, 900 data are obtained. After sorting out the data, it was finally found that the main factor affecting consumers was the amount of patchwork fabric of a piece of clothing.

2. Literature review

With the continuous development of society, environmental protection has gradually become a hot topic of The Times, and sustainability has also become a feature pursued by the garment industry [1]. In his article, Sun Zhaojie pointed out that sustainable clothing design has become a key topic in the fashion industry. The garment industry began to emphasize the importance of reducing resource waste and extending product use time in the design process [2]. Wang Xiaolei and Wang Yang put forward sustainable design strategies in fashion design and further explored how to ensure the balance between environmental protection and fashion through technological innovation [3].

In his article, Wang Jian showed how to innovate clothing design by combining traditional quilting technology with discarded materials [4]. Li Miaoyi and Qiao Hong further based on the traditional stitching process, the second innovative design of old denim clothing. Their research incorporates the innovation of traditional Chinese culture and also extends the use time of clothing materials through secondary design [5]. In his article on the redesign of discarded denim, Hong Yaoxin proposed the innovation and remodeling of denim and studied the sustainability of denim [6]. From the research in this article, it can be seen that in order to achieve the sustainability of fabrics, there are several methods: splicing, hollowing, and embroidery. In the study and application of traditional Chinese quilting art in denim clothing design, Li Mengyao proposed that by matching fabrics with different patterns, processes, fabrics and colors, traditional Chinese quilting technology could be combined with denim clothing, thus breaking the form of clothing design [7]. At the same time, due to the development of the social economy and the improvement of consumption level, sustainable development has been paid more and more attention. Therefore, the development of the garment industry in the direction of sustainability has become an inevitable trend. As an important method of sustainable design, modular design can not only improve production efficiency and reduce material waste but also extend the service life of products, thereby reducing the total amount of consumer purchases and ultimately achieving the purpose of environmental protection [8]. Stitching is a way to realize modular design. Designers can combine fabrics of different colors, shapes, and patterns according to their own ideas and achieve different effects through different combinations, thus reflecting the designability and diversity of clothing [9].

It can be seen from this article that splicing design can ensure the environmental protection and fashion of clothing at the same time. Patchwork clothing can solve the problem of environmental protection from two aspects. The first is the use of old fabrics. By combining various materials of different colors and textures, the waste and old parts of the clothes are reused, effectively reducing waste and saving resources. Through recycling and reuse, the service life of the cloth is extended and the effect of environmental protection is achieved. Secondly, the use of patchwork clothing can be customized. Splicing fashion can be customized to suit everyone's size by modifying the amount of splicing fabric, so that even if the consumer's body changes, it can also be changed by adding or reducing the fabric and changing the combination of the fabric to achieve the purpose of becoming a new fashion. This can greatly reduce the total number of clothes purchased by consumers, further reduce the amount of clothing wasted by consumers, and ultimately achieve the purpose of environmental protection. Through stitching technology, designers can use discarded fabrics and old

clothes to create new fashion products. This method not only reduces the waste of resources but also reduces the dependence on natural resources and promotes the development of the circular economy.

3. STP strategy

3.1. Segmentation

We segmented the market by demographic analysis, psychological analysis, and geographic analysis. Demographic analysis includes factors such as age, income, and level of education. The factors of psychological characteristics analysis are consumer preferences and individual needs.

3.1.1. Demographic analysis

With the improvement of consumers' awareness of environmental protection, more and more consumers begin to pay attention to whether the products they buy are environmentally friendly. As a result, sometimes the reasons for consumers to buy a product are more environmentally friendly than whether the price of the product is appropriate [10]. Therefore, when this consumption concept appeared, a kind of environmentally friendly clothing, that is, splicing clothing, began to gradually occupy the market to meet the needs of consumers.

First of all, according to the age classification, our target consumer group is 18 to 40 years old. Because first of all, most of these people can consume independently and undertake shopping. Secondly, this part of people will be more sensitive to fashion and more inclined to pursue new products. To buy the products they like, they tend to pay more for their emotional value.

In terms of income level, our customer group is the middle and high-income group. This part of the population will be more able to achieve consumption freedom, to buy their favorite products, but also more willing to accept more expensive than ordinary clothing sustainable clothing.

In terms of education, our target group is the highly educated group. This group of people after higher education, will be more likely to understand our brand concept, and, through the purchase of our products to show support for the environmental protection of this type of products.

3.1.2. Psychological analysis

Our target customers will be consumers who have requirements on whether the products they use are environmentally friendly. Our products meet the environmental standards of this type of consumer, because this type of clothing is less polluting to the environment than other clothing.

At the same time, our target customer group will also be consumers who have a demand for customization. Due to the diversity of patchwork clothing, consumers can separately buy cloth pieces from different parts of the clothes, and then freely combine them, and finally have a special style and clothing suitable for their own body.

3.1.3. Geographic analysis

For environmental factors, our market will be mainly concentrated in urban areas and big cities such as Beijing and Guangzhou. Consumers in these places will pay more attention to the concept of environmental protection, follow the fashion trend, and buy this type of environmentally friendly product. Promoting our products in these places will not only have more consumer recognition but also promote our products more effectively.
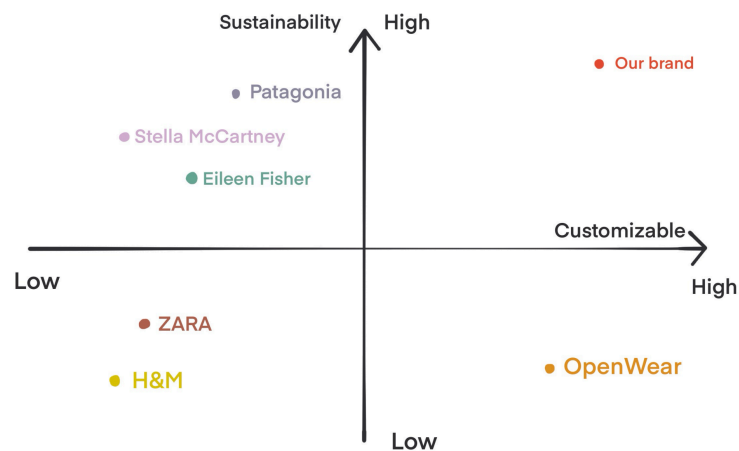
3.2. Positioning

Figure 1: Brand positioning

In the highly competitive fashion market, our brand positioning focuses on two key aspects: sustainability and customization. Through in-depth analysis, this work has developed a unique competitive advantage. As can be seen from Fig 1, most clothing brands are currently in the second, third, and fourth quadrants, which indicates that the sustainability and determinability of these clothing brands cannot be taken into account at the same time to reach a high value. The new brand takes high sustainability and high system as the brand concept, so there will be less market competition pressure and a better market environment in this field.

First, in terms of sustainability, as global environmental awareness continues to rise, more and more consumers are paying attention to the environmental impact and sustainability of clothing products. The core concept of our brand is to achieve the recycling and reuse of clothing through patchwork techniques. By reassembling old clothes or discarded fabrics, we can effectively reduce resource waste and environmental pollution in the production process. This approach not only extends the lifespan of materials but also reduces the demand for natural resources, actively responding to the trends of environmental protection and sustainable development.

Secondly, in terms of customization, modern consumers are increasingly pursuing individuality and uniqueness. Single, mass-produced products can no longer meet their needs. Our brand offers highly customizable options through flexible patchwork designs. In view of preferences, consumers can pick fabrics of disparate materials, textures, and colors while integrating them according to their body shape and style demands. Such free choice and individualized customization satisfy customers' wish for distinctive fashion, which helps to gain a more comfortable experience [11].

Our band incorporates high sustainability into high customization, providing a more eco-friendly choice for consumers and contributing to decreasing the demand for frequent changes of clothes. Hence, environmental influence will be minimized. Consumers devising their favorite garments are capable of lessening frequent purchasing behaviors from varying fashion dynamics and lengthening the service life of their clothing in conformity with the contemporary tendency of eco-aware consumption. In the market positioning diagram, our brand is positioned in the high sustainability and high customization quadrant, clearly distinguishing itself from brands that rely on fast fashion and low-cost production. We not only focus on product quality and environmental attributes but also

emphasize meeting consumers' demand for personalized designs. Through this differentiated positioning, we are able to stand out in the increasingly competitive market and attract consumers who value environmental protection and seek unique, personalized experiences.With our brand's characteristics of high sustainability and high customization, we offer consumers a shopping choice that combines fashion with environmental responsibility, paving the way for broad development prospects in the future market.

4. Conjoint analysis

Whether the design of this type of splicing meets the preferences of consumers and what factors will affect consumers' choice of this type of clothing become the first issues to be considered in this paper. Therefore, this paper adopts the method of survey and selects some consumers to fill in and choose so as to draw some conclusions. In this study, there are three similar stores that are influenced by price, the number of pieces of fabric that make up the garment, and the size of the garment. Different permutations were listed in 90 tables through conjoint analysis, and 10 groups of people were selected as the research objects of this paper. Finally, 900 data were obtained, and correlation coefficient and regression were performed.

4.1. Analysis

Table 1: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.829[a]	.687	.682	.5570

a. Predictors: (Constant), pieces3, pieces2,pieces1

The regression analysis results highlight several key aspects of the model's effectiveness. An R-square value of 0.687 indicates that the model explains 68.7% of the variation in the dependent variable, showing strong explanatory power. This suggests that the independent variables—pieces1, pieces2, and pieces3—significantly impact the dependent variable. However, 31.3% of the variation remains unexplained, likely due to factors not included in the analysis. The adjusted R-square value of 0.682 provides a more precise measure by accounting for the number of predictors, and the small difference from the R-square value indicates that the model is not overly complex or overfitted.

The standard error of the estimate is 0.5570, representing the average distance between observed values and the regression line. While this indicates a reasonably good fit, there is still room for improvement in prediction accuracy.Overall, the model shows strong explanatory power, but future analyses could add more variables to account for unexplained variation and further improve predictive ability. Additionally, testing for multicollinearity among the predictors is important to ensure the model's interpretability. This analysis provides a solid foundation for understanding the impact of different clothing components on consumer choices, supporting data-driven decisions in design and marketing strategies that align with sustainability in the fashion industry.

Table 2: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.108	2	3.554	15.311	.000[b]
	Residual	208.439	898	.232		
	Total	215.547	900			

a. Dependent Variable: Buy

b. Predictors: (Constant), pieces3, pieces2, pieces1

According to the analysis in the above table, the F value of the statistic is 15.311, and the P value is less than 0.05, which means that at least one of the selected independent variables has a significant impact on the dependent variable Y, so linear regression analysis can be performed.

Table 3: Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.701	.041		17.022	.000
	Pieces1	-.113	.025	-.187	-4.141	.000
	pieces2	-.139	.026	-.250	-5.286	.000
	pieces3	.870	.026	.126	2.667	.008

a. Dependent Variable: Buy

There are 900 data points in total, where buy=0 indicates that the customer did not choose my brand, and buy=1 indicates that the customer did choose my brand. Through regression analysis, It was able to identify the factors that influence consumer choices. The coefficients in the table show that the three independent variables—pieces1, pieces2, and pieces3—have a significant impact on the decision to choose a brand.

Specifically, the standardized coefficient for pieces1 is -0.187, indicating that this variable hurts purchasing decisions. This means that as the value of pieces1 increases, the likelihood of a consumer choosing the brand decreases. Analogously, the standardized coefficient for pieces2 reaches -0.250, suggesting a more adverse effect on shopping decisions than that of pieces1. With the increase in the value of pieces2, it is far less possible that a consumer selects the brand. By comparison, the coefficient for piece 3 reaches 0.126, which denotes a positive effect on shopping decisions. With the increase in the value of pieces3, it is more possible for a consumer to choose the brand.

In addition, the significance levels (Sig.) for the total variables are under 0.05, which illuminates that independent variables remarkably affect the dependent variable as the consumer's shopping decision. Accordingly, it is proven that discrepant product features are pivotal players in the consumer decision-making process; besides, pieces1 and pieces2 exert a stronger adverse effect on brand option, but pieces3 positively affect brand option.

Via the regression analysis, I can have a greater comprehension of consumer preferences and behaviors while regulating our corresponding brand tactic. For example, we may need to reassess the design of pieces1 and pieces2 to reduce their negative impact on brand choice. At the same time, we can further enhance the advantages of pieces 3 to increase the brand's attractiveness.

4.2. Finding

The biggest difference between our products and those of other brands lies in sustainability and customizability. These two aspects are primarily reflected in different parts of our products, with the patchwork technique being particularly prominent in our clothing.

According to the results of the regression analysis, the formula of the constructed model is: Buy=0.701 -0.113*Pieces1, Buy=0.651 -0.139*Pieces2, Buy=1.541+0.870*Pieces3. From this formula, we can conclude that Pieces1 and Pieces2 have a significant negative impact on consumers' choice of brand (i.e., Buy). In other words, as the values of Pieces1 or Pieces2 increase, the likelihood of consumers choosing the brand decreases. Conversely, Pieces3 has a positive impact on consumers' purchasing decisions, though its influence is relatively smaller.

From a broader perspective, Pieces1 and Pieces2 may represent consumers' negative perceptions of certain design elements. This could be due to these designs being too traditional, not innovative enough, or in some cases, negatively affecting the comfort or aesthetics of the clothing. This suggests that we need to make improvements in future product designs to reduce the negative impact of these two factors on brand selection. Although positively affecting shopping decisions, the effect of Pieces3 is finite, which illustrates that we can deeply improve this design element and make it attract more consumers.

Thereby, we have completely construed the effect of these variables, thus positioning our brand's design tactic more accurately, upholding sustainability, and improving the customizability of our commodities to better satisfy consumer needs. We should reevaluate the established design elements and refine our product mixture for more advantages in fierce competition. This will assist us in captivating more consumers and prioritizing customization and sustainability while improving our brand's comprehensive influence in market competition.

5. Conclusion

Through further data analysis, our research has concluded that since the number of pieces rises, it is less likely that consumers will choose the brand. In light of the regression analysis, the analyzed model is Buy=0.701-0.113*Pieces1, Buy=0.651-0.139*Pieces2, and Buy=1.541+0.870*Pieces3. These formulas manifest that Pieces1 and Pieces2 exert significant adverse effects on consumer shopping decisions. In particular, as to each unit rise in Pieces1, the probability of purchasing declines by 0.113, whereas each unit rise in Pieces2 lessens the purchasing probability by 0.139. This reveals that some design elements denoted by Pieces1 and Pieces2 might not reach consumer expectations, probably on account of problems with innovation, aesthetics, or comfort. Hence, the brand's appeal will be reduced.

On the contrary, although the influence is comparatively smaller, Pieces3 still positively affects consumer shopping decisions. The data shows that for each unit increase in Pieces3, the probability of purchase increases by 0.070. This implies that the design elements associated with Pieces3 enhance the brand's attractiveness to some degree, satisfying certain consumer preferences.

Overall, despite the positive impact of Pieces3, the general trend reveals that as the number of patchwork elements (pieces) increases, consumers' willingness to choose the brand declines. This finding suggests that future product designs should carefully control the quantity and type of pieces, avoiding the overuse of elements that negatively affect purchasing decisions. At the same time, reinforcing the design elements that have a positive influence can enhance the brand's competitiveness and lead to better market performance.

This analysis not only provides a deeper understanding of consumer behavior patterns but also helps in refining product strategies to better meet consumer needs, ultimately increasing the brand's market share.

References

[1] Mingxi C. (2023) The application practice of waste denim fabric in creative clothing design. Donghua University, Shanghai.

[2] Zhaojie S., Dan M. (2020) An Overview and Trend Analysis of Sustainable Fashion Design Methods, Progress in Textile Science & Technology.

[3] Xiaolei W., Yang W. (2018) Research on Sustainable Design Strategies in Clothing Design, China Textile Leader: 80-83.

[4] Jian W. (2016) A Study on Creative Design in Fabric Reconstruction Using Patchwork Art, China Textile Leader.

[5] Miaoyi L., Hong Q. (2020) Exploration of Secondary Innovation Design of Old Denim Garments Based on Traditional Patchwork Techniques, Progress in Textile Science & Technology. Jilin University of Arts, Changchun.

[6] Yaoxin H. (2024) Waste denim fabric redesign. Heilongjiang University, Haerbin.

[7] Yi X. (2012) The application of stitching in fashion design. Beijing Institute of Fashion Technology, Beijing.

[8] Ling L.(2017) Research on the application of modular design method in fashion design. The Tourism College of Changchun University. Changchun.

[9] Mengyao L. (2022) Research and application of Chinese traditional quilting art in denim clothing design. Jilin University of Arts, Changchun.

[10] Yingying W. (2020) Research on fashion design method and application based on sustainable development concept. Wuhan Textile University, Wuhan.

[11] Yutang W., Han Q. (2023) Integrated materials in sustainable fashion clothing design Application performance and development trend. Chemical Fiber and Textile Technology, Vol. 52: 147-149.