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CONSUMER PERCEPTIONS AND PURCHASING TRENDS OF ECO-FRIENDLY TEXTILE PRODUCTS IN THE U.S. MARKET

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Keywords

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ABSTRACT

The textile industry is undergoing a remarkable transformation due to the global push towards sustainability. This research explores consumer perceptions and purchasing trends regarding eco-friendly textile products in the U.S. market. A structured survey was conducted among 1,000 adult U.S. consumers to identify key factors influencing purchasing decisions and provide insights into the textile industry. The findings reveal broadly positive consumer perceptions of eco-friendly textiles, driven by environmental awareness, social responsibility, and health considerations. However, challenges remain regarding affordability and availability, limiting widespread adoption. Different consumer segments—Green Enthusiasts, Pragmatic Purchasers, and Skeptical Shoppers—require tailored strategies to address their unique preferences and barriers. Recommendations include investing in sustainable supply chains to reduce production costs, collaborating with certification bodies to build consumer trust, and leveraging digital platforms for consumer education. Future research directions include exploring shifts in sustainability perceptions due to COVID-19, comparative studies across generations, and global market analysis to uncover cultural influences on sustainable fashion.

1 Introduction

The textile industry is witnessing a remarkable transformation driven by the global push towards sustainability(Chakraborty & Biswas, 2020) . Rising awareness of environmental issues, including pollution, resource depletion, and climate change, has compelled both businesses and consumers to reconsider their approach to fashion and textiles (Browne et al., 2011). Traditionally known for its resource-intensive processes and environmental impact, the industry is now being held to higher standards by consumers and regulators alike (Rathinamoorthy, 2018; Wu & Devendorf, 2020). Efforts to minimize waste, reduce water consumption, and limit the use of harmful chemicals are becoming more widespread, marking a shift in how textile production is approached (De Falco et al., 2019). Brands are adopting circular economy principles, emphasizing reuse, recycling, and the sourcing of sustainable materials to meet growing consumer expectations. In response to these environmental concerns, eco-friendly textile products have gained considerable traction in recent years (Chan et al., 2017; Shirvanimoghaddam et al., 2020). These products, which include organic cotton, recycled polyester, bamboo fibers, and other sustainable materials, are being embraced by a growing segment of environmentally conscious consumers. Certifications such as the Global Organic Textile Standard (GOTS), OEKO-TEX, and Bluesign have become key indicators of sustainability, guiding consumers in their purchasing decisions. This growing demand has pushed textile manufacturers and retailers to expand their portfolios to include more eco-friendly options, leading to an increase in sustainable textile collections across both niche and mainstream fashion brands (Vassilenko et al., 2021).

In the United States, sustainable fashion encompasses a broad range of textile products, including organic cotton, recycled polyester, hemp, and other environmentally friendly materials (Schaltegger et al., 2015). Demand for these products is rising due to shifting consumer attitudes, shaped by increasing media coverage of environmental degradation, pollution, and unethical labor practices (He et al., 2016). As a result, consumers are now considering factors beyond style and price, placing greater emphasis on the environmental impact and ethical sourcing of their purchases (Younus et al., 2024). This shift has compelled the fashion industry to prioritize transparency, certifications, and sustainable practices. Brands are increasingly showcasing their commitment to eco-friendly manufacturing, responsible sourcing, and fair labor standards to meet the growing expectations of this new consumer base, resulting in a significant rise in sustainable collections and marketing strategies centered around sustainability(Gazzola et al., 2020).

In the U.S. market, there has been a noticeable shift toward sustainability in fashion, driven by consumer preferences for products that minimize their ecological footprint. This trend is particularly evident among younger consumers, who prioritize sustainability and ethical sourcing when choosing their apparel. Brands such as Patagonia, Everlane, and Eileen Fisher have gained prominence by emphasizing their eco-friendly and transparent practices, setting new standards for the industry. Retailers are also adjusting to this shift by offering more sustainable collections, collaborating with ethical brands, and incorporating circular economy practices like resale and recycling into their business models (Muralidharan et al., 2015). Such initiatives have begun to reshape the U.S. fashion landscape, with sustainability no longer confined to niche markets but permeating the mainstream. Consumer demand for sustainable fashion is driven by multiple factors, including environmental consciousness, social responsibility, and health concerns (Gazzola et al., 2020). With increased media coverage of climate change, pollution, and unethical labor practices, consumers are becoming more aware of the environmental and social implications of their purchases. Many are now actively seeking out brands that align with their values, prioritizing eco-friendly and

ethically produced textiles (Moon et al., 2013). This demand is not just limited to high-income demographics but spans across age groups and income levels, with many consumers willing to pay a premium for sustainable products. Health considerations also play a role, as buyers prefer natural, non-toxic materials that are gentle on the skin and free from harmful chemicals. Despite the rising popularity of eco-friendly textiles, significant challenges remain for both manufacturers and consumers. For manufacturers, sourcing sustainable materials often comes at a higher cost, and implementing environmentally friendly production processes requires substantial investment (Park et al., 2012). Additionally, the fragmented nature of textile supply chains makes it difficult to ensure transparency and traceability. On the consumer side, premium pricing and skepticism towards greenwashing can be barriers to adoption. Many buyers perceive sustainable textiles as expensive and are uncertain about the authenticity of brands' environmental claims. Moreover, there is a knowledge gap regarding the long-term benefits of eco-friendly textiles, such as durability and health advantages, which can deter potential buyers. Addressing these challenges requires a concerted effort from both industry stakeholders and consumer advocacy groups(Maloney et al., 2014).

2 Literature Review

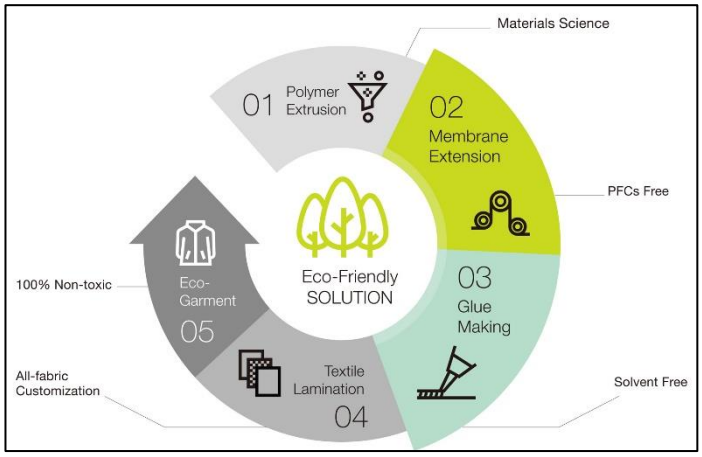
2.1 Eco-Friendly Textile Products

Eco-friendly textile products encompass a diverse range of sustainable materials and fibers, each offering distinct environmental advantages (Rathinamoorthy, 2018). Organic cotton is grown without the use of harmful pesticides or synthetic fertilizers, instead relying on natural farming practices that enhance soil health, improve biodiversity, and reduce water consumption. Its processing i nvolves fewer chemicals compared to conventional cotton, resulting in a significantly reduced environmental impact throughout its lifecycle (GOTS, 2023). Recycled polyester,

another sustainable textile, is created by transforming post-consumer plastic waste such as PET bottles into reusable fibers (Pourrahmani & Jaller, 2021). This process requires significantly less energy than producing virgin polyester and reduces greenhouse gas emissions by diverting plastic waste from landfills and oceans (Shirvanimoghaddam et al., 2020). Hemp, known for its rapid growth and high yield, requires minimal water and pesticides, making it a highly sustainable crop. Additionally, linen, derived from the flax plant, is a durable and biodegradable fiber that requires less water and pesticides than conventional crops.

Other sustainable materials include Tencel, a biodegradable fiber made from sustainably harvested wood pulp using a closed-loop production process that minimizes chemical waste (Barska & Wojciechowska-

Figure 1: Eco-Friendly Textile Products



Soure: Remington (2020)

Solis, 2020). This fiber is known for its softness, breathability, and low environmental footprint. Recycled wool also plays a significant role in sustainable textiles by reducing the demand for virgin wool and minimizing textile waste through the reclamation of post-consumer wool products (Martins et al., 2020). Moreover, bamboo is gaining popularity due to its rapid growth and regenerative properties. When processed into fibers using sustainable methods, it yields a soft, breathable fabric with antimicrobial properties. Together, these eco-friendly textiles represent a shift towards more sustainable fashion practices, emphasizing reduced environmental impact, resource efficiency, and ethical production standards.

2.2 Sustainability Certifications and Standards

Sustainability certifications and standards are essential for ensuring that eco-friendly textiles meet stringent

environmental and social criteria. The Global Organic Textile Standard (GOTS) mandates a minimum organic fiber content of 70% in certified textiles (Zhang et al., 2021). It establishes rigorous guidelines for chemical use, wastewater treatment, and social responsibility, covering the entire supply chain from fiber production to processing and packaging. The standard also includes strict requirements for worker rights, ensuring fair wages, safe working conditions, and the prohibition of child labor (De Falco et al., 2019). OEKO-TEX Standard 100 certification focuses on confirming that textiles are free from harmful chemicals, ensuring consumer safety and reducing environmental pollution. Each certified product undergoes extensive testing for substances such as heavy metals, pesticides, and formaldehyde, aligning with strict international legal standards to protect both human health and the environment (Shirvanimoghaddam et al., 2020). Meanwhile, Bluesign takes a comprehensive approach to sustainability in textile manufacturing, assessing resource efficiency, water and air emissions, and worker safety throughout the production process. The Bluesign system identifies harmful substances at every step of the supply chain, ensuring their elimination or minimization. It also promotes resource-efficient practices by optimizing energy and water use, reducing chemical waste, and improving worker safety through stringent guidelines (De Falco et al., 2017). In addition to these major certifications, other standards such as the Cradle to Cradle Certified™ and the Fair Trade Certified™ labels contribute to the sustainable textile landscape. Cradle to Cradle focuses on the circular economy by assessing product safety, material reuse, and renewable energy, while Fair Trade ensures ethical labor practices and community development (Vazquez-Brust & Plaza-Úbeda, 2021). Together, these certifications and standards guide manufacturers and consumers toward more sustainable textile production and consumption practices..

2.3 Consumer Behavior and Sustainability

Consumer behavior toward sustainable fashion is shaped by various factors, including environmental awareness, social values, and individual lifestyle choices. Research shows that environmentally conscious consumers are more likely to prioritize sustainable fashion if they have sufficient product knowledge. For instance, they are more inclined to seek out textiles made from organic cotton, recycled polyester, and other eco-friendly materials (Ibrahim et al., 2018). However, this inclination is often moderated by factors like price sensitivity and brand reputation. Consumers with higher environmental awareness are more willing to pay a premium for sustainable textiles, especially when they associate these products with quality, durability, and ethical sourcing (Kelly et al., 2019). Demographic factors such as age, income, and education also play a role. Younger consumers, particularly Millennials and Gen Z, show a stronger preference for sustainable fashion due to their heightened environmental awareness, while higher education levels correlate with increased demand for eco-friendly textiles (Cotton et al., 2020; Todeschini et al., 2017)

In addition to environmental motivations, social factors like ethical labor practices and animal welfare significantly influence consumer behavior toward sustainable fashion. Consumers are increasingly concerned about fair wages, safe working conditions, and the use of cruelty-free materials, driving them to choose brands that align with their values (Dobilaite et al., 2017; Hwang & Zhang, 2020). Despite these motivations, several barriers hinder the widespread adoption of sustainable fashion. Higher perceived costs, limited availability, and concerns about quality or style often discourage consumers from purchasing eco-friendly textiles (Cesa et al., 2019). Greenwashing, where companies falsely advertise products as environmentally friendly, has also created skepticism among consumers, leading to mistrust in brand sustainability claims (Mintenig et al., 2018). Social media and influencer marketing further shape consumer perceptions of sustainable fashion, with influencers often serving as trusted sources of information. Their endorsements can significantly impact consumer attitudes and purchasing decisions, particularly among younger demographics (Claxton & Kent, 2020). Ultimately, understanding these motivations and barriers is crucial for brands seeking to

effectively engage with the growing segment of ethically conscious consumers.

Previous studies have provided valuable insights into consumer preferences for eco-friendly fashion and their willingness to pay a premium for sustainable textiles. Hartline et al. (2016) investigated the relationship between environmental consciousness and sustainable fashion preferences, finding that environmentally conscious consumers are more likely to prefer sustainable fashion, provided they possess sufficient product knowledge. Their study also highlighted that consumers with higher levels of environmental awareness tend to seek eco-friendly textiles due to their perceived environmental benefits. However, this inclination is often moderated by factors such as product knowledge, environmental awareness, and price sensitivity. They emphasized the importance of educational campaigns to raise consumer awareness and promote informed decision-making.

De Falco et al. (2020) explored how product knowledge and environmental awareness influence consumer preferences for sustainable fashion. Their research showed that despite positive attitudes toward sustainable fashion, many consumers lack a thorough understanding of the environmental benefits of eco-friendly textiles. This knowledge gap contributes to a disparity between attitudes and purchasing behavior. They also found that price sensitivity remains a significant barrier, as many consumers are unwilling to pay a substantial premium for eco-friendly textiles, even if they recognize the environmental advantages. The study underscored the need for brands to provide clear and accessible information about the sustainability of their products to bridge this gap. Zambrano et al. (2019) examined consumer willingness to pay a premium for sustainable fashion by analyzing how brand reputation and perceived product quality impact purchasing decisions. Their findings revealed that consumers are more likely to pay a higher price for sustainable fashion if they perceive the brand as reputable and trustworthy. Additionally, perceived product quality, durability, and design play a crucial role in influencing purchasing behavior. However, many consumers remain skeptical of green claims due to instances of greenwashing, where companies falsely market their products as environmentally friendly. Yang et al. (2019) highlighted the importance of transparency and third-party certifications in building consumer trust.

Zambrano et al. (2019) investigated the impact of influencer marketing on consumer preferences for sustainable fashion, emphasizing the role of social media in shaping perceptions and purchase intentions. They found that social media influencers significantly impact consumer attitudes and behavior, particularly among younger demographics. Influencers who advocate for eco-friendly fashion can effectively convey the benefits of sustainable textiles, thereby increasing consumer willingness to pay a premium. However, the study also cautioned against over-reliance on influencer marketing, as some consumers may perceive it as inauthentic. Kirstein et al. (2021)explored the ethical appeal of sustainable fashion, examining how fast fashion's environmental and social implications influence consumer behavior. They found that while many consumers express a desire to purchase ethically produced textiles, convenience and affordability often take precedence in decision-making. Fast fashion's rapid production and low prices create a conflict for consumers who wish to make ethical choices but are constrained by financial limitations. The study revealed a growing interest in luxury fashion brands that emphasize sustainability, as these brands are often perceived as offering higher quality and ethical production practices (Belzagui et al., 2019). However, the research also noted that greater collaboration between mainstream and sustainable brands is necessary to broaden the appeal of eco-friendly fashion.

Consumers' motivations for choosing sustainable fashion often revolve around concerns for animal welfare, environmental impact, and fair labor practices (De Falco et al., 2020). However, various barriers continue to impede the wider adoption of ethical fashion, including perceived higher costs, limited availability, and concerns about quality or style (Kirstein et al., 2021). Additionally, greenwashing—a practice where companies falsely advertise products as environmentally friendly—has led to skepticism and mistrust among consumers, further

hindering their willingness to purchase sustainable textiles (Almroth et al., 2017). Social media and influencer marketing significantly shape consumer perceptions of eco-friendly fashion. Influencers often serve as trusted sources of information, influencing their followers' attitudes and purchase intentions (Kozlowski et al., 2018). Demographic factors such as age, income, and education also play a role in green consumerism. Younger consumers, especially Generation Z and Millennials, exhibit a stronger preference for sustainable fashion due to their heightened environmental awareness (McNeill & Snowdon, 2019). Moreover, higher education levels correlate with increased environmental knowledge, translating into greater demand for eco-friendly textiles (Beyer & Arnold, 2022).

3 Method

This section outlines the methodology chosen to investigate consumer perceptions of eco-friendly textiles, aiming to identify key factors driving purchasing decisions and provide insights for the textile industry. The primary tool used was a structured survey designed to collect comprehensive data on consumer demographics, environmental attitudes, brand perception, and purchasing behavior. The survey was developed through a meticulous process, including aligning questions with research objectives, pilot testing for clarity, and an expert review for validation. The survey was organized into specific sections: demographics collected data like age ranges, gender, income brackets, education levels, and geographic location; environmental attitudes employed Likert scales to measure environmental concerns, sustainability knowledge, and eco-label effectiveness; brand perception assessed sustainable versus traditional fashion brands and brand loyalty; and purchasing behavior included questions about purchase frequency, preferred materials, willingness to pay a premium, and barriers to buying eco-friendly textiles.

The target population comprised adult U.S. consumers interested in fashion, and a random sampling technique ensured representativeness while reducing bias. A sample size of 1,000 respondents was determined through a power analysis, providing statistical power and robustness for subgroup analysis. Descriptive statistics such as mean, standard deviation, and frequencies will summarize the data, while multiple linear regression will analyze relationships between independent variables (e.g., demographics, environmental attitudes) and the dependent variable (e.g., purchase intention). Cluster analysis will identify distinct consumer groups based on their attitudes and behaviors. To ensure ethical practices, informed consent was obtained, participant anonymity was maintained, and responses were stored securely. Although self-reported data can be prone to biases, the rigorous methodology and comprehensive survey design provide a solid foundation for understanding consumer perceptions of eco-friendly textiles.

4 Findings

4.1 General Perceptions

Consumer perceptions of eco-friendly textile products are shaped by varying levels of awareness regarding sustainable textile materials and certifications. While many consumers are aware of terms like "organic cotton" and "recycled polyester," knowledge of more specialized materials, such as Tencel and hemp, remains relatively limited. Similarly, certifications like the Global Organic Textile Standard (GOTS) and OEKO-TEX Standard 100 are recognized by environmentally conscious consumers, yet many struggle to differentiate between certifications and understand their specific criteria. Eco-friendly fashion is broadly defined by consumers as clothing made from environmentally friendly materials, produced through ethical labor practices, and designed to reduce environmental impact throughout its lifecycle.

4.2 Brand Associations

In terms of brand associations, leading eco-friendly brands such as Patagonia, Eileen Fisher, and Everlane are consistently perceived positively due to their transparency, sustainable sourcing, and ethical production practices. Fast fashion brands like H&M and Zara are also gaining recognition for their sustainability initiatives, but skepticism remains due to their primary business models. Transparency and storytelling are crucial, as consumers increasingly demand detailed information about product

origins, materials, and the social impact of their purchases. Brands that effectively communicate their sustainability efforts through compelling narratives tend to resonate more strongly with eco-conscious consumers.

4.3 Purchasing Trends and Influencing Factors

4.3.1 Demographic Trends

Demographic trends reveal that younger age groups, particularly Millennials and Generation Z, are most inclined to purchase eco-friendly textile products due to their heightened environmental awareness and social values. Older generations, such as Baby Boomers and Generation X, are also interested in sustainable fashion, primarily motivated by health considerations and quality. In terms of income, higher-income brackets generally show a greater willingness to pay a premium for sustainable textiles, viewing them as a long-term investment in quality and ethics. Lower-income consumers, however, often prioritize affordability over sustainability, indicating a need for accessible eco-friendly options.

4.3.2 Key Purchasing Drivers

Key drivers influencing consumer purchasing decisions include environmental awareness, social responsibility, and health considerations. Consumers increasingly recognize the environmental benefits of sustainable textiles, such as reduced pollution and resource efficiency. Social responsibility, particularly ethical labor practices, remains a significant motivator, as consumers seek to avoid supporting exploitative labor conditions. Health considerations also play a role, with many preferring natural, non-toxic materials for their clothing. Quality and aesthetics are equally important, with consumers expecting sustainable textiles to be durable, comfortable, and stylish.

4.3.3 Barriers to Purchase

Despite growing interest, several barriers hinder the widespread adoption of eco-friendly textiles. Higher costs remain a primary obstacle, as sustainable products often come at a premium price, limiting accessibility for many consumers. Availability is another concern, as eco-friendly collections are not as widely stocked as conventional fashion lines. Furthermore, some consumers perceive sustainable fashion as lacking in style or design choices, while skepticism about greenwashing and the authenticity of brands' sustainability claims adds to the reluctance.

Table 1: Summary of the findings of Purchasing Trends

Aspect	Details
General Perceptions	▪ Awareness of common sustainable materials like "organic cotton" and "recycled polyester" is relatively high. ▪ Limited knowledge of specialized materials such as Tencel and hemp. ▪ Recognition of certifications like GOTS and OEKO-TEX Standard 100, but difficulty differentiating between certifications and understanding criteria. ▪ Eco-friendly fashion broadly defined as clothing made from environmentally friendly materials, produced through ethical labor practices, and designed to minimize environmental impact.
Brand Associations	▪ Leading eco-friendly brands (Patagonia, Eileen Fisher, Everlane) perceived positively for transparency, sustainable sourcing, and ethical practices. ▪ Fast fashion brands (H&M, Zara) gain recognition for sustainability initiatives but face skepticism due to their primary business models. ▪ Transparency and storytelling are crucial, with consumers demanding detailed information about product origins and the social impact of purchases.

Demographic Trends	▪ Younger age groups (Millennials and Gen Z) most inclined to purchase eco-friendly textiles due to heightened environmental awareness and social values. ▪ Older generations (Baby Boomers and Gen X) also interested, motivated by health considerations and quality. ▪ Higher-income brackets show greater willingness to pay a premium for sustainable textiles. ▪ Lower-income consumers prioritize affordability, indicating a need for accessible eco-friendly options.
Key Purchasing Drivers	▪ Environmental Awareness: Consumers recognize environmental benefits such as reduced pollution and resource efficiency. ▪ Social Responsibility: Desire to support ethical labor practices and avoid exploitative conditions. ▪ Health Considerations: Preference for natural, non-toxic materials. ▪ Quality and Aesthetics: Expectation of durability, comfort, and style.
Barriers to Purchase	▪ Higher Costs: Premium pricing of sustainable products limits accessibility. ▪ Availability: Eco-friendly collections not as widely stocked as conventional fashion lines. ▪ Style and Design: Perceived lack of style or design choices. ▪ Greenwashing Skepticism: Uncertainty about the authenticity of brands' sustainability claims.

5 Consumer Segmentation

5.1 Green Enthusiasts

Green Enthusiasts are highly eco-conscious consumers willing to pay a premium for sustainable textiles. They actively seek detailed product information, certifications, and transparency in sourcing and production. Often driven by strong environmental and ethical values, this segment values brands that align with their principles and are willing to invest in sustainable fashion despite the higher cost.

5.2 Pragmatic Purchasers

Pragmatic Purchasers are moderately eco-conscious consumers who prioritize value and quality. While they appreciate sustainability, they need a balance between affordability and eco-friendliness. They tend to choose sustainable textiles if the quality and price are competitive, but are less likely to seek certifications or detailed information.

5.3 Skeptical Shoppers

Skeptical Shoppers have low environmental awareness or are skeptical of sustainability claims. They prioritize price and style over eco-friendliness and are generally less informed about sustainable textiles. For this segment, affordability and design are paramount, and they often view sustainable fashion as expensive and lacking in variety.

Table 2: Summary of the Consumer Segmentation findings

Segment	Description	Key Characteristics	Priorities	Challenges
Green Enthusiasts	Highly eco-conscious consumers willing to pay a premium for sustainable textiles.	▪ Strong environmental and ethical values ▪ Actively seek detailed product information ▪ Value transparency and certifications	▪ Ethical sourcing ▪ Transparency in sourcing and production ▪ Detailed information about sustainability	▪ Higher cost of sustainable fashion does not deter them

Pragmatic Purchasers	Moderately eco-conscious consumers who prioritize value and quality.	▪ Appreciate sustainability but need affordability ▪ Balance between affordability and eco-friendliness ▪ Less likely to seek certifications	▪ Quality ▪ Affordability ▪ Competitive pricing	▪ Unwilling to pay a significant premium for sustainable fashion
Skeptical Shoppers	Consumers with low environmental awareness or skepticism towards sustainability claims.	▪ Prioritize price and style over eco-friendliness ▪ Less informed about sustainable textiles ▪ Perceive sustainable fashion as expensive	▪ Affordability ▪ Style and design	▪ Low awareness of sustainability issues ▪ Skeptical of sustainability claims

6 Discussion

Transparency and storytelling are vital strategies for brands seeking to build trust with consumers in the eco-friendly textile market (Choudhary et al., 2018; de Medeiros et al., 2014). By clearly communicating their sustainability initiatives, sourcing practices, and production processes, brands can differentiate themselves and establish credibility. This transparency allows consumers to trace the journey of a product from raw material to finished garment, providing them with the information needed to make informed decisions. For instance, Patagonia's "Footprint Chronicles" and Everlane's "Transparent Pricing" initiatives offer detailed insights into their supply chains, resonating strongly with eco-conscious consumers (Fletcher, 2010; Napper & Thompson, 2016). Storytelling further enhances this trust by sharing the personal stories behind sustainable practices, whether it's the journey of an organic cotton farmer or the innovative recycling process of PET bottles into polyester fibers. By weaving these narratives into their branding, companies can connect with consumers on an emotional level, reinforcing the authenticity of their sustainability efforts.

Pricing strategies play a crucial role in attracting different consumer segments to eco-friendly textile products. For Green Enthusiasts willing to pay a premium, brands can maintain higher price points while emphasizing the quality, durability, and ethical aspects of their products(de Medeiros et al., 2014; Hur, 2020). However, for Pragmatic Purchasers and Skeptical Shoppers, pricing needs to balance affordability with sustainability. Offering entry-level sustainable collections at competitive prices can encourage these segments to consider eco-friendly options. Brands like H&M and Zara have successfully implemented such strategies with their Conscious and Join Life collections, respectively, making sustainable fashion more accessible. Moreover, tiered pricing strategies, including discounts for bulk purchases or loyalty programs, can incentivize repeat purchases and build brand loyalty across different consumer groups (Almroth et al., 2017; McNeill & Snowdon, 2019).

Adjusting supply chains is essential for brands aiming to source sustainable materials and maintain certifications. Brands must establish partnerships with certified suppliers to ensure a consistent supply of organic cotton, recycled polyester, and other eco-friendly materials. These partnerships should align with certifications like GOTS, OEKO-TEX, and Bluesign, guaranteeing adherence to rigorous environmental and social standards (Kozlowski et al., 2018). Furthermore, adopting a circular supply chain model that emphasizes recycling and upcycling can minimize waste and reduce dependency on virgin resources. Brands like Stella McCartney and Eileen Fisher have successfully integrated circularity into their supply chains, collecting post-consumer textiles for recycling into new products (Fletcher, 2010). Additionally, blockchain technology can enhance supply

chain transparency, allowing consumers to verify the authenticity of sustainability claims. Tailoring communication strategies to different consumer segments is vital for effectively promoting eco-friendly textiles. For Green Enthusiasts, brands should emphasize the environmental impact, ethical sourcing, and certifications of their products, providing detailed information through blogs, reports, and interactive content (Choudhary et al., 2018). For Pragmatic Purchasers, the focus should shift toward quality, durability, and affordability, highlighting the long-term value of sustainable textiles (de Medeiros et al., 2014). Skeptical Shoppers, on the other hand, may respond better to messaging that emphasizes style, comfort, and competitive pricing, while subtly introducing sustainability benefits. Brands can use targeted social media campaigns, email marketing, and personalized recommendations to reach these segments effectively (de Medeiros et al., 2014; Napper & Thompson, 2016).

Influencer partnerships and collaborations with eco-fashion advocates can significantly amplify a brand's message (McNeill & Snowdon, 2019). Influencers who authentically advocate for sustainable fashion can bridge the gap between brands and consumers, making eco-friendly textiles more relatable and desirable (Beyer & Arnold, 2022). By partnering with influencers who align with their brand values, companies can tap into new audiences and reinforce their credibility. For instance, Reformation collaborates with eco-fashion advocates like Aditi Mayer and Venetia La Manna to showcase its sustainable collections. Additionally, featuring customer testimonials and eco-friendly lifestyle bloggers in marketing campaigns can build a sense of community and trust around the brand (de Medeiros et al., 2014). Highlighting the quality, durability, and health benefits of sustainable textiles alongside their environmental advantages can appeal to a broader audience. Sustainable materials like organic cotton and Tencel are not only eco-friendly but also breathable, hypoallergenic, and gentle on the skin. Recycled polyester offers durability and moisture-wicking properties, making it ideal for activewear (Napper & Thompson, 2016). By emphasizing these functional benefits, brands can dispel misconceptions about sustainable fashion being inferior in quality or style (de Medeiros et al., 2014; Fletcher, 2010; Napper & Thompson, 2016). Furthermore, framing sustainable textiles as a long-term investment in quality, backed by warranties or repair services, can attract value-driven consumers who seek durability and longevity in their purchases.

7 Conclusion

The research reveals that consumer perceptions of eco-friendly textiles are broadly positive, with growing interest in sustainable fashion driven by environmental awareness, social responsibility, and health considerations. However, challenges remain regarding affordability and availability, limiting widespread adoption. Different consumer segments—Green Enthusiasts, Pragmatic Purchasers, and Skeptical Shoppers—require tailored marketing strategies to address their unique preferences and barriers. For Green Enthusiasts, detailed information on certifications and ethical sourcing is crucial, while Pragmatic Purchasers value quality and affordability, and Skeptical Shoppers prioritize style and competitive pricing.

Key recommendations include investing in sustainable supply chains to reduce production costs and improve accessibility, thereby making eco-friendly textiles more affordable. Greater collaboration between brands and certification bodies can ensure consistent standards and build consumer trust. Furthermore, leveraging digital platforms for consumer education and engagement will help bridge knowledge gaps and dispel misconceptions about sustainable fashion, ultimately encouraging informed purchasing decisions. Future research directions could explore shifts in consumer sustainability perceptions due to the COVID-19 pandemic, given the increased emphasis on health and safety. Comparative studies between generations—Gen Z, Millennials, Gen X, and Baby Boomers—would provide insights into their distinct attitudes and motivations toward eco-friendly textiles. Additionally, a global market analysis comparing consumer perceptions across different geographic regions could uncover unique cultural factors influencing sustainable fashion preferences.

harness this potential fully, confronting challenges such as computational costs, data bias, and privacy concerns. Active collaboration between stakeholders and continued research will drive the responsible implementation of ML, fostering sustainable urban development. As ML evolves, it will play an increasingly influential role in shaping efficient and equitable urban futures where resource efficiency, environmental responsibility, and the well-being of citizens are at the forefront.

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