

Article

Motivators and Barriers for Buying Intention of Upcycled Fashion Products in China

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Abstract: This study examines determinants of the consumption behavior of upcycled fashion products in China. Theoretical and empirical evidence from the upcycled fashion consumption and related literature are used to develop a model to explain consumers' buying intention toward upcycled fashion products. Environmental consciousness, consumer knowledge of upcycled fashion fabrics, and perceived risks of upcycled fashion products are proposed as key factors (i.e., motivators and barriers) of behavioral intention toward the purchase upcycled fashion products. Hypothesized antecedents of buying intentions toward upcycled fashion are included in the theoretical model, which was tested using structural equation modeling analysis on data from a sample of 397 consumers in China. Environmental consciousness encompassed two factors and was therefore divided into environmental concerns and importance of environmentally conscious behavior. Perceived risks at the time of purchasing upcycled fashion products showed three factors: social, financial, and performance risk perceptions. After examining the impact of environmental consciousness and perceived risks on purchase intention toward upcycled fashion products, this study found that both factors had statistically significant effects on purchase intention. In addition, the study revealed that knowledge of upcycled fashion materials was mediated in the relationship to explain the impacts of Chinese consumers' perceived importance of conscious behavior and perceived risks of upcycled fashion products on their intention to purchase upcycled fashion products. In other words, to increase the purchase intention toward upcycled fashion products, it is necessary to raise Chinese consumers' environmental knowledge of upcycled fashion materials, while improving the importance of conscious behaviors and reducing the perceived risk. The implications of the findings for public policy and as guidelines for future research are outlined and discussed.



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Keywords: upcycled fashion; environmental consciousness; consumer knowledge; upcycled fashion material; perceived risk; buying intention; China

1. Introduction

Growing populations in need of more resources and goods coupled with an unsustainable build-up of waste and a contentment with non-renewable, single-use products have led to growing environmental issues [1]. There has been growing concern about discarding textile waste all around the world since the carbon emitted by factories is accelerating global warming due to mass production and overconsumption [2,3]. Because of the negative environmental impacts and lack of sustainability, changes in consumption behaviors are needed to reduce, recycle, and reuse. Many countries have attempted to change misuse and overconsumption for several decades by establishing sustainable practices across various industries including fashion. The expansion of the fashion industry has been due to the growth of economies and the global population as well as fast fashion cycles, which have led to the generation of waste. The huge amount of textile waste can cause severe environmental problems since the fashion industry is one of the most polluting operations [4]. Fabric waste is the major waste produced during the textile manufacturing process and is

mainly generated from discarded clothes in the fashion supply chain. Recently, however, within the apparel and textile industries, there have been increasing efforts for circular textiles that are continuing to gain power [5,6]. A circular economic model can be described as “an industrial scheme that is restorative by intent and design, uses and reuses natural materials as effectively as possible, and achieves value through products’ lifecycles” [7]. This is a movement away from today’s linear model of “produce, use, and dispose” toward one where the regeneration of resources and reduction of waste are important criteria in the initial development of goods and services [6–8]. The main challenge for the utilization of textile waste is finding a method to reuse and reclaim fabric waste.

The textile industry has become the second worst polluting industry worldwide with a considerable accumulation of textile waste and the use of environmentally hazardous chemicals [9,10]. Thus, the need for sustainable solutions for both the use of resources and the increased waste associated with the textile industry is becoming more urgent. Because of the unsustainable nature of the fashion industry, various solutions have been projected to protect the environment, including cooperative consumption, such as swapping used goods and renting goods, and the reuse of products [11,12]. As a sustainable solution, upcycling continues to attract the attention of scholars, the industry, and environmentally conscious individuals [13–15]. This trend is motivated by growing environmental concerns about resource availability and the growing waste volume [16]. Upcycled refers to a process in which used materials are converted into new items of higher value and quality in their next lifecycle [13–15,17]. It has been increasingly recognized as a hopeful and sustainable way to reduce material and energy use, and to build sustainable production and consumption in the textile and apparel industries [18]. Because of these benefits, lots of interest in upcycled fashion has emerged from academia and the industry in recent years [13–15]. However, peoples’ perceptions of discarded waste and recycling are predominantly negative [19]. Accordingly, although interest in environmentally friendly management of fashion companies is increasing [9,10], there is a certain gap between consumers’ perceptions and actual action [19], so more research is needed on consumers’ motivations and barriers to selecting upcycled fashion products.

Along with growing sustainability trends worldwide, China is also concerned about the environmental impact of textile waste. Currently, approximately 26 million tons of textile waste is generated in China every year, and it is predicted that it will increase in the future [20]. Only 85% of the fabric is used, on average, in the clothing production process in China, and the remaining 15% is wasted. Other clothing materials that are mainly chemical materials, such as synthetic fibers and artificial fibers, are discarded, difficult to decompose, and can only be reclaimed or incinerated. However, these processes increase the environmental impact both directly and indirectly [21]. China is not only a major producer of textiles, but it also generates 10 billion tons of waste each year as a world-class consumer market. Waste textiles account for 3.5% to 4% of the total waste in China. However, approximately 4 million tons of waste textiles are used for recycling in China every year, and the main source is secondhand clothing [21]. In China, huge quantities of fabric are accumulated as waste, so a circular economy system for collecting secondhand clothes is gradually being formed. Upcycled fashion is also an important alternative to prevent fashion environmental pollution.

Many textile and clothing companies in China recognize environmental protection as their social responsibility and are trying to improve environmental problems through material production and environmental investment. Despite the attention paid to the circular economy system and sustainability in the Chinese textile industry [10], research on upcycled fashion products in China has been limited and has tended to neglect motivators and barriers of upcycled fashion product consumption in China. Therefore, it remains unclear what factors encourage Chinese consumers to choose upcycled fashion products and why they hesitate to choose these products [19,22]. To encourage the use of upcycled fashion products in the Chinese market, this study aims to investigate the impact of Chinese consumers’ environmental consciousness [22] and awareness of upcycled fashion

materials [23,24] on the purchase intention toward upcycled fashion products. A main assumption among researchers has been that a decrease in perceived risks of a new and unusual product category (e.g., sustainable fashion products) will increase the subsequent product purchase [24,25]. Hence, this study presumes that consumers who have high environmental consciousness and low perceived risks, stemming from high environmental awareness of upcycled fashion fabrics, may present a stronger behavioral intention to purchase upcycled fashion products. The results of this study can provide upcycling product companies with strategies and insights related to marketing and developing sustainable consumption.

2. Theoretical Background and Development of Hypotheses

2.1. Sustainability and Upcycled Fashion in China

Upcycling aims to avoid wasting potentially useful materials by utilizing existing materials [26]. Because upcycling can reduce the consumption of new materials in manufacturing products, upcycling can contribute to reduced energy consumption, air pollution, water pollution, and even greenhouse gas emissions resulting from the use of new raw materials. Upcycling is a compound word stemming from “upgrade” and “recycling”; the process of upcycling renovates and converts waste or useless products and upgrades them into more valuable products than the originals [27]. In other words, upcycling can be described as the re-creation of an existing product into a new product by adding ideas and redesigning the existing product to impart new value, rather than simply recycling waste products. Upcycling is an emergent subject of academic inquiry and business practice [16]. However, upcycled design products that use discarded materials typically provoke negative perceptions, as people believe that the products are made from garbage [16,19].

According to the China National Textile and Apparel Council, the textiles and apparel industry was named the world’s second-most polluting industry after oil at the 2019 Climate Innovation and Fashion Summit [28]. Since the 1990s, China’s production and export of textiles and apparel has ranked first in the world, and this rising textile and apparel industry has played an important role in the economic development and livelihood of the Chinese people. However, it has also resulted in environmental pollution problems. According to the 13th Five-Year Plan for Economic and Social Development of the People’s Republic of China (2016–2020), the companies in the textile industry in 2020 with an annual main business income of \$3 million or more shall accumulatively reduce energy consumption per unit by 18%, decrease cumulative carbon dioxide emission intensity by 22%, accumulatively reduce water volume by 23%, and achieve a recycled fiber total amount of 12 million tons [29]. In addition to the policy interests of the textile and apparel industry in sustainability issues, there is an increasing recognition of environmental issues among consumers. Many textile and apparel companies in China have recognized environmental protection as a corporate social responsibility; as such, they are striving to resolve environmental problems [10,21].

Chinese fashion companies are currently investing heavily in the recycling of waste clothing rather than embracing upcycling [30,31]. For example, in 2009, LINING and TEIJIN collaborated to recover old clothes and chemically decompose them to convert them into raw polyester materials, and the raw polyester materials were further converted into high-quality recycled polyester fibers [32]. These fibers could be used to manufacture new clothing products. In addition, since 2010, Bosideng, Jiangnan University and the Tianjin Institute of Technology in China have jointly formed a scientific and technological team to research and develop recovery treatments and technology for discarded down jackets. Both examples fall into the category of recycling. According to the Textile Industry Development Plan (2016–2020) announced by the Ministry of Industry and Information Technology of China, the establishment of a textile recycling system was set as a core plan. Although global upcycling fashion companies have achieved significant production scales and sales platforms, Chinese fashion enterprises are only at the beginning of the journey toward upcycling [33].

Because the upcycling industry in China is currently in the early stages of development, related studies concerning Chinese's upcycled fashion consumption are insufficient. Lee [30] indicated that the use of upcycling will be a sustainable and optimistic element for the future of the fashion industry, which will create more positive values in the fashion industry and a better design environment. Based on Lee's [31] case studies on sustainable fashion design, a design plan using the upcycling method was presented. According to Lim's [23] discussion and design practice regarding the recycled fashion design method in China, clothing design was conducted by combining recycled fashion design methods with denim. Previous research on upcycling in China has mainly focused on design analysis [31,33], and recently, little empirical research has been conducted on consumers' purchases of upcycled fashion products [13–15,34–36]. Upcycling is undoubtedly individual and ad hoc, in other words, it is a post-manufacturing process [37] and can thus be usefully positioned in the context of self-production practices. Yu and Lee's study [15], which investigated consumers' value perceptions and their intentions to purchase upcycled goods, indicated that the perceived utility value of upcycled products affected product attitude, which, sequentially, affected buying intention. Noting that very few of the relevant studies were analytically based, Peschel et al. [14] provided more information on the consequences of product communication among consumers in Denmark and Germany to support sustainable decisions, concentrating on upcycling and the food sector.

Currently, the importance of and interest in upcycling fashion is increasing in China, and research on upcycling fashion for China is needed even more now because of mass production and overconsumption due to the large population. However, there is inadequate research on Chinese upcycled fashion consumption. It is very important for scholars and practitioners to uncover the factors that influence consumers' actual purchases in the decision-making process of a particular product to propose implications and strategies for the future of sustainable fashion [38]. Therefore, this study focuses on enablers and barrier factors which influence Chinese consumers' behavior regarding upcycled fashion products.

2.2. Consumer Environmental Consciousness

Consciousness refers to thoughts, values, mental readiness, and knowledge oriented toward a specific action [39]. Environmental consciousness can be defined as one's concern and value for the safety and long-term well-being of the ecosystem [40]. Many studies indicate that consumers who are concerned about the environment exhibit an intention to practice environment friendly behaviors such as recycling [41] and tend to purchase environment-friendly products [22]. As environmental consciousness has been considered a critical indicator of behavioral changes, it is important to study consumers' environmental concerns and consciousness to understand sustainable fashion consumption, such as upcycled fashion product buying behaviors. Several authors have described environmental concern as a strong attitude toward the conservation of the ecosystem and as one of the main factors affecting sustainable apparel buying behavior [42].

Birgelen et al. [41] found that German consumers tended to have positive attitudes toward beverages with environment-friendly packaging when they had a high level of environmental consciousness. According to Choi and Choi [22], the more that consumers in Korea, the U.S., and Japan recognized the importance of pro-environmental consumption behaviors, the more supportive they were to pro-environmental actions. Kong [43] classified ethical consumption consciousness into four factors: environmental protection consciousness, social responsibility consciousness, energy saving consciousness, and resource saving consciousness. The higher the ethical consumption consciousness, the higher the intention to purchase ethical fashion products. Cha [44] also investigated the influence of ethical consumption consciousness on purchasing attitudes regarding recycled clothing products. Jung et al. [42] found that sustainable consciousness, such as pro-environmentalism and social responsibility, had a positive impact on sustainable apparel products. The findings of these studies show that environmentally conscious consumers tend to perceive that the protection of the environment and human beings is important.

Environmental consciousness indicates how much people value environmentally conscious actions such as sustainable consumption [45,46].

Unlike natural disasters, environmental problems are social disasters created by humans, which often accompany industrialization and urbanization. In a highly advanced information society, consumer consciousness of environmental problems is important [47]. To improve the quality of the environment, consumers need a responsible attitude that voluntarily excludes behaviors that induce environmental problems and promotes an ecological lifestyle in a series of life management processes, such as purchasing, using, and disposing of resources in daily life [42]. Environmental consciousness can be a consumer's consideration of not only the satisfaction of individual needs, but also the enhancement of the welfare of society, with consistent interest in the impact of individual actions on the environment in the entire consumption process of purchasing, using, and disposing of products. Rising environmental damage and its impacts, such as climate change and global warming, have led to an increased awareness of sustainability, which, in turn, has increased consumer consciousness about environmental consumption and the effects of daily purchase decisions, triggering numerous studies [22,41,42,45,46]. This study considers the two dimensions of consumers' environmental consciousness and environmental concerns, as well as consumers' perceived importance of environmentally conscious behaviors. Environmental concerns are generally considered to be important motivational drivers of upcycling [48,49], which is why the practice is often recommended [15,50]. Nevertheless, it is important to study not only the concern, but also the degree of consumer perception, of how important conscious behavior is to practice [42]. Thus, the following hypothesis was generated:

Hypothesis 1 (H1). *Environmental consciousness (H1-1, environmental concern; H1-2, perceived importance of environmental conscious behavior) will have a positive influence on buying intention toward upcycled fashion products.*

2.3. Perceived Risks

When consumers recognize undesirable or uncertain outcomes, they are hesitant [51]. Since the consequence is unpredictable, they are more hesitant when there is a high risk in the purchasing decision. Perceived risk refers to the state in which consumers cannot reliably predict the outcome of their purchase, and they are anxious about the fact that some outcomes may be unwanted [52]. Perceived risk is considered in psychological, financial, physical, social, and performance perspectives [53]. According to Bettman and Park [24], conditions in which risk is perceived include lacking product information, no previous purchase experience, innovative products, technically difficult products, large discrepancies in quality, and expensive prices [54]. In these situations, consumers' perceptions of the risk tend to increase when purchasing is an important decision. Tarabieh [35] viewed perceived risks from a multidimensional perspective, rather than a single dimensional perspective, to comprehensively describe the risk factors that may occur in the customer's purchasing decision process. In addition, Kang and Kim [25] observed the perceived risks in various dimensions according to the type of fashion product and shopping context.

The risk perceived by buyers differs according to the product characteristics. In other words, depending on the product to be purchased, the buyer may perceive the social, psychological, functional, and economic risks differently. The characteristics of products are recognized by buyers as a major factor in determining their risk perception [55]. According to Park and Choo [27], who surveyed Korean consumers regarding upcycled fashion, psychological risks were determined to be important risk factors when purchasing upcycled fashion products, and social, performance, and economic risks were determined to be risk factors of relatively lower significance. These perceived risks reflected the unique characteristics of upcycled fashion products. The research results by Choi and Kim [56] also showed that consumers' perceived risk regarding food safety was an important variable in organic food purchasing behavior. On the basis of these results, the current study proposes

the need to explore the dimensions of risk perception related to upcycled fashion products among Chinese consumers. This study focuses on the following three dimensions: social, financial, and performance. These dimensions are the risks that consumers face when purchasing new fashion products and are also the most frequent dimensions in consumer purchase decisions [52,57].

Social risk is the concern about a negative outcome, including criticism and embarrassment from family, friends, or important others [25,52]. This unpleasant consequence occasionally occurs in buying and using products and involves a threat to personal values, such as identity and image [52]. Social risk occurs during the brand selection process and when consumers think that their purchase could be negatively perceived by others [58]. Social risk is relevant to self-image and being concerned with others' opinions and expectations [25]. Consumers may predict negative social consequences. For example, they may think that friends will disrespect them if they say that they wore upcycled clothes that others wore before.

Financial risk is consumers' perception of potential economic loss from product purchases [59] and is highly related to monetary issues, such as the price or payback [52]. Financial risk is mainly prevalent in shopping situations where consumers have doubts about the retailers [60]. Higher confusion and uncertainty driven by unusual purchases may increase consumers' perceived financial risk [61]. In our context, consumers may perceive financial risk when they purchase upcycled fashion products that do not meet their expectations. Consumers may also have suspicions about potential damage during the upcycling process of secondhand fashion products and thus regret the money they paid for the product.

Performance risk is associated with the concern that the purchased product will not meet consumers' functional expectations, which is also considered a quality risk [59]. From the fashion perspective, functional aspects include quality, garment durability, and ease of care, and the disappointment of these functions is performance risk. This risk increases when consumers do not have enough information and confidence to assess fashion products [62]. Performance risk may also include potential negative consequences (e.g., repairs) when the product performance fails, which might incur additional costs, such as physical and mental costs [57]. Kim et al. [34] indicated that performance risk significantly affects Korean consumers' buying intention toward circular fashion consumption, such as recycled and upcycled fashion items. Thus, consumers' perceived high performance risk may lead to hesitation to purchase upcycled fashion products. Taken together, this study assumes that there are negative effects of social, financial, and performance risks on consumers' purchase intention toward upcycled fashion products. Thus, the following hypothesis is proposed:

Hypothesis 2 (H2). *Perceived risks of upcycled fashion products (H2-1, social; H2-2, financial; H2-3, performance) will have a negative influence on buying intention toward upcycled fashion products.*

2.4. Environmental Knowledge of Upcycled Fashion Materials

A lack of knowledge about sustainability issues and problems is often a barrier to sustainable fashion consumption [63]. However, concerns about the environment alone are not enough, since increased knowledge about environmental deterioration and sustainable materials is also required [64,65]. Ansari and Siddique [64] described environmental knowledge as how much people know about environmental problems and ecosystems. Environmental knowledge can be comprehensive, such as knowledge about environment friendly goods, or more particular knowledge about topics such as recycling or upcycling [66].

Most of today's garments are made of synthetic fibers that are manufactured using petrochemical materials, which result in environmental toxic waste. Nylon and polyester are representative examples of synthetic fibers that are difficult to treat because they are not easily decomposed naturally, and even if decomposed after a long period of time, the pro-

cess discharges harmful gases into the air [67]. Environmentally friendly refers to pursuing future development by seeking a harmonious direction for both abundant human life and environmental preservation. Thus, many textile companies are focusing their efforts on developing environment-friendly textile materials by reusing and recycling products, and thus extending the use of materials [68]. Because environmentally friendly textiles mean clothes made with minimal chemicals, the clothing should not include synthetic chemical materials. Instead, manufacturers should incorporate natural ingredients, such as beans, corn, bamboo, or coconut, and newly developed materials made by recycling once-used raw materials or other materials such as waste plastic bottles, waste fishing nets, and fibers. These products are naturally decomposed into harmless materials by microorganisms after their disposal [67]. Upcycled products are manufactured by combining these materials [16], usually including waste fibers and waste leather, which represent the external properties of important materials [23]. Because the raw materials for upcycled fashion products are basically discarded materials, high durability is required for producing the products. To increase durability, manufacturers apply coating or special materials that are resistant to product friction and deformation.

Environmental knowledge plays an important role in sustainable consumption [1]. Consumers' environmental consciousness encourages them to seek positive knowledge about upcycled fashion materials. According to Peschel et al. [14], the rationale behind upcycling can derive from the desire to make others aware of environmental issues. This study examines whether consumers have enough knowledge about the characteristics of upcycled fashion materials, i.e., what the degree of knowledge is about upcycled fashion materials. We also investigated the influence of such knowledge on the purchase intention toward upcycled fashion products. Mahmoud et al. [66] indicated that there are insufficient studies on the mediating role of environmental knowledge. Furthermore, there is a strong need for more dissemination of such knowledge in the China market [1]. Thus, this study investigated the mediating effects of environmental knowledge of upcycled fashion materials when purchasing upcycled fashion products by examining the relationship among consumers' environmental consciousness, perceived risk, and purchase intention toward upcycled fashion products; therefore, we expect the following:

Hypothesis 3 (H3). *Consumer knowledge of upcycled fashion materials will have a positive influence on buying intention toward upcycled fashion products.*

Hypothesis 4 (H4). *Consumer knowledge of upcycled fashion materials will play a mediating role between environmental consciousness/perceived risk and buying intention toward upcycled fashion products.*

2.5. Buying Intention

Intention to buy is described as intention indicating that a consumer is ready to buy a product after evaluating it [53]. Ajzen and Fishbein [69] defined intention as an individual's willingness to voluntarily exert effort to perform a certain action [70]. To predict the future behavior of consumers, typical marketing research utilizes buying intention as a factor describing the relationship between attitude and behavior. Another study defined purchase intention as the willingness to recommend specific products or services to others who want to purchase them [42]. Purchase intention is one of the most important concepts in the sustainable consumption research area, because the research on purchase intention is performed based on the correlation between purchase intention and purchase behavior [71]. The buying intention toward upcycled fashion products is the likelihood of a consumer purchasing the upcycled fashion products, generating positive word of mouth, and the inclination to pay for the items [34]. According to a study on the buying intention of environment-friendly products, consumers with environmental consciousness and knowledge of environment-friendly items showed high buying intentions [72].

More conscious consumers, who are concerned about environmental problems and are aware of the negative consequences of their actions, may still indulge in consumption that does not reflect environmental practices [73]. They may also avoid recognizing environmental challenges when their perceptions conflict with their well-being, economic wealth, and material demands. The continued increase in the production of cheap trendy clothing and unsustainable consumption practices, despite the growing consciousness of sustainable issues, partially explains the present gap between thoughts and real actions in the circular and sustainable fashion field [17]. The literature review above demonstrates the inconclusive findings in upcycled fashion research; therefore, this study aims to identify motivators and obstacles of buying intention toward upcycled fashion products, especially in China. The definitions of the research variables and concepts in this study are presented in Table 1.

Table 1. Definitions of the research concepts and variables.

Concepts and Variables	Definition	Sources
Upcycled fashion	This refers to a process to reuse discarded objects or materials in such a way that creates a product of higher quality or value than the original.	[13]
Environmental consciousness	This indicates one's concern and value for the safety and long-term wellbeing of the ecosystem, and the level of importance people perceive toward the environment, which leads to environmentally conscious actions.	[45,46]
Environmental concern	This refers to the strong attitude toward the conservation of the ecosystem and the degree to which an individual is concerned about environmental problems.	[40,42,74]
Importance of conscious behavior	This indicates the level of importance people perceive toward environmentally conscious actions.	[45,46]
Perceived risk	This refers to the state in which consumers cannot reliably predict the outcome of their purchase, and they are worried about the fact that some outcomes may be undesirable.	[52,75]
Social risk	This refers to concerns about being criticized for buying upcycled fashion products from important others.	[76]
Financial risk	This refers to consumers' perceived economic risk of investing loss or additional expenses for replacement or repair of the secured product when there are some defects.	[34,77]
Performance risk	This indicates the uncertainty associated with the consequence of a product that does not function as expected.	[77,78]
Knowledge of upcycled fashion materials	This represents how much people know about environmental problems and upcycled fashion materials.	[64]
Buying intention	This refers to an individual's willingness to voluntarily exert effort to perform a certain action.	[69]

3. Methods

3.1. Conceptual Framework

According to previous research, consumers' behavior related to sustainable fashion consumption is driven by motivating factors (e.g., environmental consciousness and consumer knowledge of upcycled fashion materials) and barriers (perceived risks). Therefore, this study formulated a conceptual framework related to these factors. The main purpose of this study is to investigate whether the motivators and barriers could impact consumer buying intention toward upcycled fashion products. The framework of this research is illustrated in Figure 1. In particular, this study explores the principal factors that can influence upcycled fashion consumption behaviors among Chinese consumers.

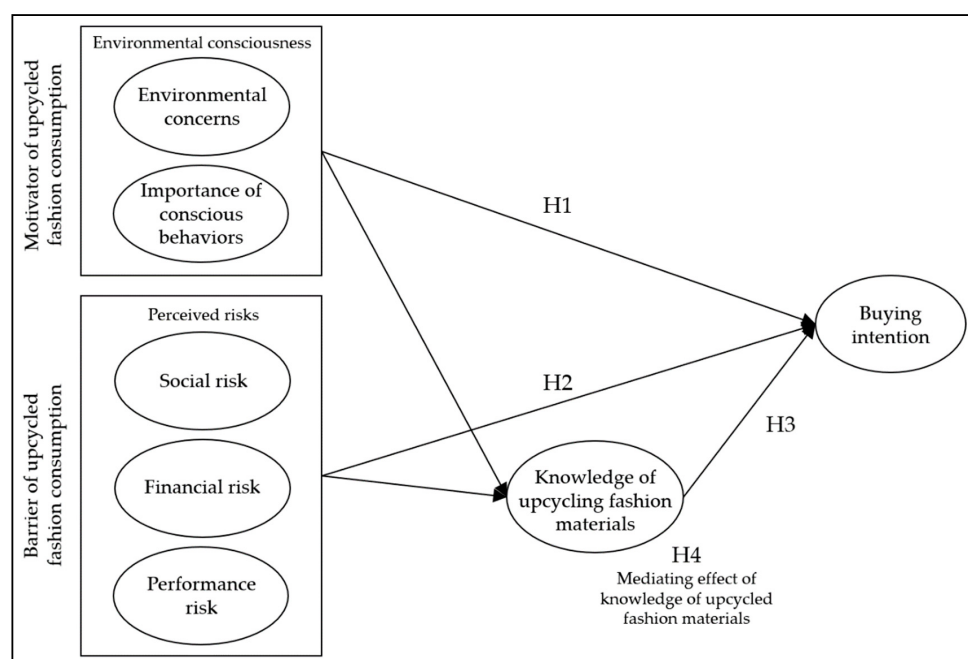


Figure 1. The theoretical model of motivators and barriers to sustainable fashion consumption.

3.2. Measurement

All measurement items shown in Table 1 were adapted from related prior research. For the environmental consciousness variable, a total of 10 items were measured. These items included five items for environmental concern and five items for importance of environmental conscious behaviors based on previous studies [45]. For the factors related to consumers' awareness of upcycled fashion materials, four items were measured based on a study by Lee et al. [23] and Mahmoud et al. [66]. To measure the perceived risk in purchasing upcycled fashion products, 10 items were measured based on existing research, [53,61] including three items for financial risk perception, four items for performance risk perception, and three items for social risk perception. As for the buying intention factor for upcycled fashion products, three items were measured referring to Nguyen et al.'s [70] study. All items were measured using a 5-point Likert scale (1 = Strongly disagree, 3 = Neutral, 5 = Strongly agree).

3.3. Sample and Procedures

To understand Chinese upcycled fashion consumption, this study conducted an online survey recruiting participants in their 20s and 30s from two metropolitan cities (Shanghai and Wuhan, in China). Since 20–30 year old consumers are a major target market for sustainable products [79], this sample could give critical indication regarding the upcycled fashion consumption behaviors. The subjects for this study were sensitive to new fashion trends and were in the demographic that leads the consumption market in China. The China Business Network, a Chinese media company, ranked major cities in China by comparing them using various commercial aspects. On the basis of the results, the cities were categorized into first-tier, new first-tier, second-tier, third-tier, fourth-tier, and fifth-tier cities. According to the “2019 Urban Business Attractiveness Ranking” published by the China Business Network [80], Shanghai and Wuhan, which are first-tier cities, showed a higher degree of commercial resource intensity, urban transportation hubs, urban activity, diversity of life patterns, and future plasticity in China. In addition, on 1 July 2019, Shanghai became the first city in China to implement the strictest garbage separation system, and Wuhan was gradually expanding the scope of the implementation, which was fully implemented on 1 July 2020.

Out of the 500 distributed questionnaires, 425 data were collected (response rate of 85%), and 397 were used in the final data analysis after poorly described answers were

excluded. We used G*Power 3.1.9.7, which is a statistical power analysis program, to calculate the appropriate sample size for the structural equation modeling [81]. As a result of the power analysis, 371 respondents were found to be the right sample size for this study [82,83]. Therefore, we concluded that the sample size used in this study is appropriate and proceeded with the analysis. The SPSS 25.0 and AMOS 25.0 statistical programs were utilized to analyze the data. Factor analysis and reliability verification were conducted to identify the dimensions of the research variables (i.e., environmental consciousness, knowledge of upcycled fashion materials, risk perception when buying upcycled fashion products, and buying intention of upcycled fashion products) using SPSS version 25.0. AMOS 25.0 was used to execute the structural equation modeling (SEM) analysis to test the hypotheses.

3.4. Data Collection and Demographic Information

Table 2 shows the results of examining the characteristics of the study subjects. The ratio of male to female respondents was 57.7:42.3, indicating 15.4% more female respondents. As for the age of the respondents, 57.4% were in their 20s and 42.6% were in their 30s, indicating 14.8% more respondents in their 20s. In terms of marital status, unmarried respondents were the most common at 56.2%, followed by married (42.6%), and other (1.2%). In terms of academic background, the percentage of college graduates was the highest at 63.5%, followed by graduate school graduates (12.1%), graduate school attending (11.1%), and high school graduates (13.3%). As for jobs, the percentage of office workers was the highest at 36.8%, followed by professional and technical workers (27.9%), students (20.4%), business managers (7.5%), service employees (4.8%), housewives (1.8%), and other (0.8%). The monthly household income from 11,001 to 23,000 RMB was the highest at 53.4%, followed by less than 11,000 RMB (29.2%), 23,001–35,000 RMB (11.6%), and above 35,000 RMB (5.8%). The proportion of respondents who usually sorted waste into different elements was 94.2% in Shanghai and 44.2% in Wuhan, amounting to 65.7% in the total sample.

Table 2. Demographic information of the sample of respondents.

Demographic City			Shanghai	Wuhan	Demographic City			Shanghai	Wuhan
Gender	Male	N	80	88	Marital	Married	N	102	67
		%	20.2	22.2			%	59.6	29.7
	Female	N	91	138		Single	N	69	154
		%	22.9	34.8			%	40.4	68.1
Age	20~29	N	90	138	Educational Level	High School	N	10	43
		%	22.7	34.8			%	2.5	13.1
	30~39	N	81	88		Undergraduate	N	146	106
		%	20.4	22.2			%	36.8	26.7
Occupation	Student	N	10	71		Graduate	N	15	77
		%	2.5	17.9			%	3.8	19.4
	Housewife	N	0	7	Income per month (RMB)	Under 11,000	N	32	84
		%	0	1.8			%	8.1	21.1
	Office worker	N	104	42		11,001–23,000	N	115	97
		%	26.2	10.6			%	29	24.4
	Service employees	N	5	14		23,001–35,000	N	17	29
		%	1.3	3.5			%	4.3	7.3
	Professional technical	N	37	74		Above 35,000	N	7	16
		%	9.3	18.6			%	1.8	4
	Business manager	N	15	15	Waste sorting	Do	N	161	100
		%	3.8	3.8			%	94.2	44.2
	Others	N	0	3		Not do	N	10	126
		%	0	.8			%	5.8	55.8

3.5. Reliability and Validity

Factor analysis and reliability verification were performed to detect the dimensions of the research variables (i.e., environmental consciousness, knowledge of upcycled fashion materials, risk perception when purchasing upcycled fashion products, and purchase intention toward upcycled fashion products) using SPSS version 25.0 (see Table 3). Additionally, confirmatory factor analysis (CFA) was tested using AMOS 25.0. The theoretical framework of this study explored structural equation modeling using AMOS version 25.0 to assess the reliability, dimensionality, and validity of the scales applied in the measurement model. The validity and reliability were estimated in the measurement model. The internal consistency and reliability were analyzed using composite reliability.

Table 3. Internal reliability and convergent validity of the study.

Factor and Items	Factor Loading
Environmental Consciousness	
Environmental concerns (AVE = 0.53; CR = 0.82; Cronbach's α = 0.67)	
Environmental pollution issues are serious at the global level.	0.804
Despite the slower pace of economic development, environmental issues should be improved.	0.709
Humans should live in harmony with nature.	0.662
Importance of conscious consumption (AVE = 0.54; CR = 0.84; Cronbach's α = 0.60)	
The purchase of environment-friendly products contributes to protecting the environment.	0.776
Strong regulation of companies that cause environmental pollution is crucial.	0.747
Legal regulations should be strengthened to encourage companies to develop environment-friendly products.	0.678
Perceived Risk of Upcycled Fashion Products	
Social risks (AVE = 0.54; CR = 0.84; Cronbach's α = 0.69)	
I think the people around me will not support my use of upcycled fashion products.	0.762
I think the purchase of upcycled fashion products will not earn the respect of others.	0.700
Financial risks (AVE = 0.57; CR = 0.86; Cronbach's α = 0.65)	
I think it is not worthwhile spending money on upcycled products.	0.786
I think the price of upcycled fashion products is relatively high.	0.722
Performance risks (AVE = 0.56; CR = 0.91; Cronbach's α = 0.71)	
I think upcycled fashion products have no commodity value.	0.714
I think the design of upcycled fashion products will not vary.	0.779
Knowledge of Upcycled Fashion Materials (AVE = 0.57; CR = 0.83; Cronbach's α = 0.81)	
I know that because upcycled products reuse materials from used products, materials with high durability and low abrasion are mainly used.	0.752
I know that there are many upcycled fashion products mixed with several waste materials, because the amount of recycled material is limited.	0.728
I know that the materials used in upcycled fashion products are meaningful in that they can convey stories about the materials for consumers with sustainable purposes.	0.786
Buying Intention of Upcycled Fashion Products (AVE = 0.62; CR = 0.88; Cronbach's α = 0.86)	
I am willing to purchase upcycled fashion products.	0.752
In the future, I will be willing to use upcycled fashion products.	0.825
I am willing to visit a store that sells upcycled fashion products.	0.789
Model Fit: $\chi^2 = 234.802$, $df = 114$, $\chi^2/df = 2.060$, $p < 0.001$ GFI = 0.94, AGFI = 0.91, CFI = 0.94, TLI = 0.92, NFI = 0.90, RMSEA = 0.05	

Note. standardized coefficients; all significant at $p < 0.001$; AVE = Average Variance Extracted; CR = Composite Reliability; GFI = Goodness-Of-Fit Index; AGFI = Adjusted Goodness-Of-Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; NFI = Normed Fit Index; RMSEA = Root-Mean-Square Error of Approximation.

To test the validity and reliability of the measurement model, we analyzed the standard factor loading value, t-value, p-value, standard error, average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha (α) indices. The reliability and validity of the proposed measurement model were assessed following Hair et al. [84]. As Table 2 shows, the results from the assessment of standardized factor loading were between 0.730 and 0.866. In the CFA, the overall fit indices $\chi^2 = 234.802$, $df = 114$, GFI = 0.94, AGFI = 0.91,

CFI = 0.94, TLI = 0.92, NFI = 0.90, and RMSEA = 0.05, indicated a satisfactory fitness of the model [60]. The average variance extracted (AVE), which also represented the total variance in the latent construct indicator, was between 0.662 and 0.825. These values were satisfactory considering the suggested value of 0.50. The range of CR was from 0.82 to 0.91, so internal reliability was attained. Cronbach's alpha values ranged from 0.60 to 0.86, and AVE values ranged from 0.53 to 0.62.

Table 4 shows the discriminant validity results. Discriminant validity describes a state where each variable of a theoretical model has different statistics. Discriminant validity could be assessed using a method in which AVE is compared with squared correlations between one construct and another construct. In this study, discriminant validity was analyzed following the process by Fornell and Larcker [85]. Discriminant validity is supported when the AVE between each pair of constructs is greater than Φ^2 , which is the squared correlation between the two constructs.

Table 4. Discriminant validity and correlation of constructs.

Variables	Correlation Coefficient						
	1	2	3	4	5	6	7
1 Environmental concern	0.53 ^a						
2 Importance of conscious behavior	0.45 ^b 0.67 ^{***,c}	0.54					
3 Social risk	0.01 0.13	0.00 0.04	0.54				
4 Financial risk	0.00 0.01	0.08 −0.29 ^{**}	0.24 0.49 ^{***}	0.57			
5 Performance risk	0.03 0.18 [*]	0.01 0.12	0.20 0.45 ^{***}	0.26 0.51 ^{***}	0.56		
6 Knowledge of upcycled materials	0.02 0.16 [*]	0.10 0.32 ^{***}	0.28 0.53 ^{***}	0.05 0.23 ^{**}	0.28 0.53 ^{***}	0.57	
7 Buying intention	0.00 0.02	0.02 0.15 [*]	0.40 0.64 ^{***}	0.05 0.23 [*]	0.12 0.35 ^{***}	0.29 0.54 ^{***}	0.62

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; ^a: Average variance extracted (AVE), ^b: Squared correlations between any pair of constructs, ^c: Correlation coefficients.

4. Results

4.1. Testing the Hypotheses

SPSS AMOS version 25.0 was used to execute the structural equation modeling (SEM) analysis to test the hypotheses. The impact of the independent variables on the dependent variable was partially found to be statistically significant at the $p < 0.05$, $p < 0.01$ and $p < 0.001$ levels. Table 4 shows the structural model proposed in this analysis and the goodness of fit. The findings represent a suitable fit for the measurement model. Table 5 displays that the model adequately fits the measurement data as well as the structural models [86]. Path analysis was used in SEM to assess hypothesized direct influences among the constructs from H1 to H3.

All the hypotheses were supported except for H1-1; therefore, the proposed theoretical model in Figure 1 is empirically supported. The path results of SEM are presented in Table 4, which indicates that the t -value for the paths of H1-1 (−0.70), H1-2 (2.85), H2-1 (−3.93), H2-2 (−2.32), H2-3 (−2.92) and H3 (4.42) are higher than the standard t -value. The results demonstrate that knowledge of upcycled fashion materials has a significant impact on buying intention of upcycled fashion products in this study. Moreover, the importance of conscious behavior is found to be positively associated with purchase intention while social, financial, and performance risks are negatively associated with purchase intention among Chinese consumers. It was expected that environmental concerns would have a

positive impact on the intention to purchase upcycled fashion products; however, this study found no significant relationships.

Table 5. Path Analysis Assessment of the Hypotheses.

Independent Variables	Estimate (β)	t-Value	Hypothesis	Results
Environmental concerns	−0.09	−0.70	H1-1	Rejected
Importance of conscious behavior	0.27	2.85 **	H1-2	Supported
Social risk	−0.31	−3.93 ***	H2-1	Supported
Financial risk	−0.23	−2.32 *	H2-2	Supported
Performance risk	−0.29	−2.92 **	H2-3	Supported
Knowledge of upcycled fashion material	0.44	4.42 ***	H3	Supported

Notes: Dependent variable = Buying intention of upcycled products; β , the path coefficient; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Structural model fit indices: $\chi^2(df) = 234.802(57)$, CFI = 0.94, GFI = 0.94, NFI = 0.89, and RMSEA = 0.05.

4.2. Mediating Effect

In this study, one of the hypotheses was to test for the mediating role of knowledge of upcycled fashion materials in the relationships between environmental consciousness/perceived risk about upcycled fashion products and purchase intentions toward upcycled fashion products. For the assessment of the hypothesized mediation effects (i.e., H4), we applied the underlying steps suggested by Mathieu and Taylor [87].

Table 6 presents the result of the samples in this study's bootstrapping analysis to assess the mediating effect and indirect impact through the mediating variable [88]. We used 2000 iterations to obtain 95% confidence intervals [89] to validate the statistical significance of the indirect effects. The mediating effect of knowledge of upcycled fashion products on the relationship between the importance of conscious behavior and buying intention of upcycled fashion products was significant ($\beta = 0.042$, $p < 0.01$). In addition, knowledge of upcycled fashion materials significantly mediated between the perceived social ($\beta = 0.074$, $p < 0.01$), financial ($\beta = 0.045$, $p < 0.01$), and performance ($\beta = 0.057$, $p < 0.01$) risks and the buying intention of upcycled fashion products.

Table 6. Bootstrapping analysis for the mediating effects of knowledge of upcycled fashion materials.

Independent Variables (X)	Total Effect	Direct Effect	Path _{XM}	Path _{MY}	Indirect Effect
Environmental concerns	−0.057	−0.083	0.101	0.255 ***	0.026
Importance of conscious behavior	0.185 **	0.143 *	0.191 *	0.219 ***	0.042 **
Social risk	−0.120 **	−0.194 *	0.311 ***	0.239 ***	0.074 **
Financial risk	−0.046 *	−0.091	0.214 **	0.209 ***	0.045 **
Performance risk	−0.025 *	−0.082	0.233 **	0.243 ***	0.057 **

Notes: Dependent variable (Y) = Buying intention of upcycled products; Mediating variable (M) = knowledge of upcycled fashion materials; β , the path coefficient; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The results showed significant total effects from the importance of conscious behavior and the three perceived risks, as the independent variable, on knowledge of upcycled fashion material and buying intention, as the dependent variable. However, the direct and total effects of environmental concerns on the dependent variable were not shown as significant. Meanwhile, when the independent variable and the mediating variable were simultaneously entered, if the effect of the independent variable on the dependent variable was significant, there was a partial mediating effect, and if the effect of the independent variable on the dependent variable was not significant, there was a full mediating effect. In this study, the results demonstrated that knowledge of upcycled fashion materials fully mediated the effects from the independent variables, such as financial and performance risks, on purchase intention. The result showed the partial mediating role from knowledge of upcycled fashion materials regarding the effects from independent variables, such as the importance of conscious behavior and social risks on purchase intention. Consequently, hypothesis H4 was partially supported.

5. Discussion

In light of textile waste increase and the continued use of environmentally hazardous chemicals, the clothing and textile industry has become the second worst polluting industry worldwide [90]. Therefore, significant effort is currently in progress to discover solutions to reduce this harmful impact [91]. Upcycled fashion is an internationally growing industry for sustainability, minimizing the resources thrown away during production, and finding new possibilities in the resources already thrown away. Upcycled fashion products imparted with high commercial values already marketed in Europe and the United States are expanding their market share by circulating to high-value-added fashion products. However, upcycled fashion tends to lack data because it was just introduced in China. In addition, consumers are unwilling to place sustainable consumption concerns into actual practice, since their environmental worries and perceptions do not always transform into pro-environmental or sustainable behavior [19]. Marketers need a clear understanding of this disparity between concerns and actions. Therefore, this study attempted to identify motivators and barriers to upcycled fashion consumption among Chinese consumers.

This study considered two environmental consciousness factors and three perceived risks to analyze the buying intention of upcycled fashion products. Consumers' environmental consciousness was determined as a total of two factors: concerns about environmental issues and importance of environmentally conscious behavior. The risk perception factors in purchasing upcycled fashion products were revealed as three factors: social risk perception, financial risk perception, and performance risk perception. In this study, consumers' perceived importance of conscious behavior was observed to positively affect purchase intention of upcycled fashion products and it was found that environmental concerns did not affect the intention of purchasing upcycled fashion products. It was expected that environmental concerns would have a positive impact on the intention to buy upcycled fashion products; however, this study found no significant influence environmental concerns on buying intention, supporting Tam and Chan's previous research [92]. Recognizing the importance of actual environmentally conscious behavior has a positive impact on sustainable consumption behavior, such as buying upcycled fashion products. In addition, social, financial, and performance risks were negatively associated with purchase intention among Chinese consumers. Perceived risks and levels of uncertainty felt by Chinese consumers when making purchasing choices could be an important factor in obstructing newly introduced product choices [27] such as upcycled fashion products in China. The results of this study indicate that perceived risk factors should be considered in the consumption context of upcycled fashion products. It is possible to increase the buying intention of upcycled fashion products by reducing consumers' social, financial and performance risk perception by the proper communication mix strategy, so that consumers have no doubts in choosing upcycled fashion. These results differ from those of Yu and Lee [13], who surveyed U.S. consumers for their intention to purchase upcycle products. Their work showed that consumers' social and performance perceptions had no significant impact on upcycle product attitudes and purchasing intentions. According to a study [42] comparing sustainable apparel consumption among consumers in the United States, the United Kingdom, and China, Chinese consumers valued social aspects, practicality, and performance when purchasing sustainable fashion products more than other countries, supporting results of this study.

The results demonstrate that knowledge of upcycled fashion materials had a significant impact on buying intention of upcycled fashion products in this study. Moreover, knowledge of upcycled fashion materials mediated the relationship between consumers' environmental consciousness and purchase intention for upcycled fashion products. Consumer's environmental consciousness entirely affects the knowledge of upcycled fashion materials, further influencing the purchase intention for upcycled fashion products. Thus, to increase the purchase intention toward upcycled fashion products, upcycled fashion companies should strengthen both the consumers' environmental consciousness, such as the importance of conscious behaviors, and their knowledge of upcycled fashion materials.

Knowledge of upcycled fashion materials also had a mediating role in the relationship between perceived risks and purchase intention toward upcycled fashion products. It is therefore possible to increase buying intention of upcycled fashion products by reducing consumers' risk perception through promoting specific and genuine environmental friendliness in products from environment-friendly brands [93]. Marketers and policy enforcers should make consumers more knowledgeable by spreading information about upcycled fashion materials and issues through legal guidelines, media reports, and environment-friendly public relations in the manufacturing and marketing sectors of companies. In this way, consumers' environment-friendly consciousness and perception of environment-friendly products can be strengthened, and perceived risks can be condensed.

Upcycled fashion is essential as part of environmental protection, but the negative perception that these products were made from discarded items and other relevant perceived risks are obstacles to consumer purchases. Therefore, in this study, we tried to investigate the reasons why Chinese consumers' intention to buy upcycled fashion products is increasing, and we tried to investigate what factors influence the intention of Chinese consumers to buy upcycled fashion products, focusing on their environmental consciousness, knowledge of upcycled fashion materials, and perceived risk factors when purchasing upcycled fashion products. This study contributes to sustainable and upcycled fashion literature and information. Many fashion companies are struggling to attract and retain customers with sustainable fashion products, such as upcycled fashion products, because of the challenges of textile wastes. There has been limited research on upcycled fashion product consumption in China. Findings from the present study can enable researchers and practitioners to understand how to improve buying intention toward upcycled fashion products by minimizing risks and ensuring that consumers' sustainable shopping experience is more conscious and knowledgeable regarding upcycled fashion products and the planet. Mainly upcycling to improve product values through the reuse of resources is a dark zone in consumer evaluations. It should enhance product values, but it might be difficult to distinguish from the regaining of resources or secondhand usage, which are both perceived to lower value or quality [37]. This study aimed to deliver more knowledge to businesses with results of a more quantitative analysis to support resolutions about which sustainable approach to follow, similar as Peschel et al. [14], but focusing specifically on upcycling for the fashion area.

This research has some limitations that require further studies. The sample size and the target population impeded the generalization of the results. For forthcoming research, a larger sample size can engender more comprehensive results for the analysis of the hypotheses. This study was conducted in Shanghai and Wuhan, China. Future studies can be conducted in other cities and countries in developed and developing countries. In addition, future research can examine the impact of socio-demographic variables [79], such as age, gender, occupation, income levels, or education backgrounds, as moderating factors in the relationships among the determinant variables of upcycled fashion consumption and the buying intentions of upcycled fashion products. It would be interesting to expend the investigation to specific cohorts (e.g., "Gen Z" vs. "Millennials") or different product categories (e.g., electronics vs. fashion) to see if the findings would be similar or different.

While we suggest that the significant mediating role of knowledge of upcycled fashion materials can explain upcycled fashion consumption behavior, its connection with environmental consciousness and perceived risks requires a fuller assessment together with other antecedents. Future research could propose other antecedents, including consumers' psychographic perspectives, such as their lifestyles and values, marketing perspectives, such as perceived benefits and important criteria, or attributes of upcycled fashion products among the Chinese. Interestingly, neuroscience provides cutting-edge ways to assess incongruity in consumer behavior by evaluating dissimilarities in separate sensitivity throughout areas, or structural discrepancies, in the brain. According to several research studies [94,95], consumer neuroscience research should assist in advancing more operational interventions and the furtherance of consumer decision making, and in detecting weaknesses that may

appraise guidelines for consumer protection. Therefore, we suggest applying the consumer neuroscience approach for the next study to identify the motivators and barriers of buying intentions toward upcycled fashion products. This research focused on the buying behavior of sustainable apparel. We also acknowledge that in real-life buying situations, many other factors can influence the decision-making process of sustainable apparel products. For instance, psychological characteristics, such as harmonious values in China and living in a collectivist society, will play an important role in sustainable development [79,96]. This limitation encourages the development of this research by including other psychological factors that may impact sustainable consumption and conducting further investigations on post-consumer sustainable behavior, such as recycling or disposal behavior, regarding apparel products in China. Lastly, the separation of waste is policy-driven, and mainly in large cities in China [97], which can have an important influence on circular economy behavior, such as upcycled fashion consumption. Hence, we highlight this prerequisite to facilitate more distinguished approaches to advocating sustainable upcycled fashion consumption.

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