

Article

Exploring the Sustainability Concepts Regarding Leather Apparel in China and South Korea

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Abstract: Sustainability in business and personal life has increased over the past few years and is continuing to develop. Consumption in the clothing and textiles industry causes a significant impact on the environment and utilizes unsustainable practices, from clothing production to use and disposal. With shifts toward a more sustainable future within the government, businesses, and society, the apparel industry and consumers must prepare for a sustainable future. This study examines the determinants of sustainable apparel consumption behavior in China and South Korea. Theoretical and practical evidence from the literature on sustainable consumption is applied to develop a model for investigating the consumers' behavioral intentions to buy, use, and recommend sustainable leather apparel products. Environmental knowledge, perceived consumer effectiveness, sustainable consumption beliefs, and self-enhancement are proposed as key determinants of behavioral intention to buy, use, and recommend eco-friendly faux leather apparel (E-FLA). The hypothesized antecedents of these concepts are part of the model, as modified by the theory of planned behavior, and the model is examined using structural equation modeling on data from a sample of 450 respondents collected in China and South Korea. An analysis of data is carried out to identify the underlying dimensions of sustainable consumption beliefs and behaviors including pro-environmentalism, social responsibility, and animal conservation. The results show that the key determinants of behavioral intentions to buy, use, and recommend E-FLA are pro-environmentalism and social responsibility, which are related to sustainable consumption belief dimensions and consumers' self-enhancement. The positive determinants of sustainable consumption beliefs are found to be both environmental knowledge and perceived consumer effectiveness. These results suggest the need for greater environmental knowledge and perceived consumer efficiency in the effort to achieve more sustainable clothing consumption. The implications of the findings for public policy and recommendations for further studies are outlined and discussed.

Keywords: sustainable consumption behavior; theory of planned behavior; eco-friendly faux leather apparel (E-FLA); environmental knowledge; perceived consumer effectiveness; sustainable consumption beliefs; self-enhancement

1. Introduction

The products and services incorporating sustainable and pro-environmental attributes and considerations have become increasingly appealing to consumers [1–3]. Public concerns about the quality of life of human beings as well as the quality of natural environments and ecosystems have led to the increasing importance of sustainability for governments and for all industries, including the apparel industry in both China [4] and Korea [5].

Severe air pollution problems, such as the high level of particulate emissions and climate change caused by global warming, have become serious social problems, environmental concerns, and

sustainability issues in both China and South Korea [6]. Since sustainable consumption behavior has been comparatively neglected by Asian consumers compared with Western consumers [7], examining the similarities or differences between Chinese and Korean segments is of interest to comprehend sustainable Asian behaviors. The global market for eco-friendly apparel is relatively small (1% of the total world-wide apparel market). However, this market is predicted to double over the next 10 years owing to increased media attention, growing consumer awareness of environmental and sustainability issues specific to apparel and textile production, and greater commitment among apparel firms to execute sustainable and socially responsible approaches to manufacturing [8].

Recently, a new generation of designers has been building brands with more conscious and sustainable approaches to fashion at their core. Whether they source fabrics through collectives empowering female workers (Richard Malone), use only recycled cottons and plastics (Alyx), or transform vintage scarves into resolutely contemporary dresses (Marine Serre), their approaches are aimed at sustainability [9]. Similarly, long-established apparel brands, including Levi Strauss, American Apparel, and Burton, have responded to growing media attention and consumer interest by altering their product design, development, and sourcing strategies to achieve sustainable performance [10]. However, leather is not easily amenable to the ideals of sustainable consumption, as its production is responsible for the problems of animal cruelty and environmental destruction related to the pollution caused by the toxins used in the tanning process. Given the increased interest on the part of consumers in the claims of sustainability by makers of apparel products [11–14], this study focused on the research and development of eco-friendly faux leather apparel (E-FLA), which is eco-friendly and bio-degradable, protecting both animals and the natural environment. As part of laying the groundwork for introducing and promoting E-FLA to potential sustainability-oriented consumers, this study aims to identify the socio-psychographic factors of consumers which drive their behaviors in purchasing and using E-FLA through the application of the theory of planned behavior.

The theory of planned behavior (TPB) model is widely applied to analyze consumers' behaviors [15,16]. The TPB appears to be a robust way of explaining pro-environmental and pro-social behaviors [17]. Sustainable consumption can create an individual, symbolic feeling of advantage which is associated with a certain lifestyle (activities, interest, and opinions) or an expression of personal identity and other social values or beliefs. Within the framework of the TPB, this study identifies the influential determinants (environmental knowledge, perceived consumer effectiveness, sustainable consumption beliefs, and self-enhancement) of behavioral intention to buy, use, and recommend E-FLA.

Despite the rising concerns for sustainability issues in society, research has tended to neglect the multi-dimensional sustainable consumption beliefs regarding the apparel and textile industry. Additionally, studies in the context of textiles and apparel focused on the process of the formation of beliefs about sustainable consumption, including antecedents and outcome factors within Asian consumer sectors, have been limited. A main assumption among researchers has been that any increase in environmental knowledge [18,19] and perceived consumer effectiveness, defined as the notion that the efforts of an individual can make a difference in solving problems [20], will increase environmental concern and beliefs. Abdul-Muhmin [21] indicated that consumers' self-enhancement—the positive emotions of achievement that a consumer expects to derive from consuming in a pro-environmental manner—could affect their pro-environmental behavioral intentions. Hence, this study assumes that consumers who have a strong sustainable consumption belief stemming from a high level of environmental knowledge and perceived consumer effectiveness may have a stronger purchase intention with regard to E-FLA products, mediated by a high self-enhancement feeling related to sustainable consumption.

The environment and animal-friendly faux leather is a newly-developed product in South Korea with superior performance and bio-degradability. In order to encourage the use of this sustainable product in the Chinese and South Korean marketplaces, this study examines behavioral intention to buy, use, and recommend E-FLA and investigates the pro-environmental ideas and sustainable consumption beliefs of potential consumers. Although many studies applying the TPB model have

predicted sustainability behavior intentions [3,22,23], the potential use of the TPB model related to sustainable consumption on the part of Asian consumers in the fashion industry context has been neglected [24]. Thus, this study applies the TPB model to Chinese and South Korean consumers in relation to the apparel and textile industry. Recently, researchers [6,25] have suggested that it is helpful to include other consumer psychographic constructs into the TPB model when investigating consumers' sustainability intentions. Hence, this study aims to modify and use the TPB model to investigate how the relationships among a variety of consumer characteristics (i.e., environmental knowledge, perceived consumer effectiveness, multi-dimensional sustainable consumption beliefs, and self-enhancement); the behavioral intention to buy, use, and recommend E-FLA; and culture, can indicate novel prospects for achieving insights related to developing theories and marketing strategies for sustainable consumption.

2. Background

2.1. Sustainability in the Apparel and Textile Industry: Eco-Friendly Faux Leather Apparel (E-FLA) Products

Following the 1983 World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland, a 1987 report named "Our Common Future" was published, defining Sustainable Development as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The Brundtland report highlighted three fundamental components to sustainable development: environmental protection, economic growth, and social equity. The concept of sustainability was focused on finding strategies to promote economic and social advancement in ways that avoid environmental degradation, over-exploitation, or pollution, while less productive debates about whether to prioritize development or the environment were sidelined [26].

The apparel and textile industry must take its philosophy of sustainability seriously and face its responsibility to society, in particular, because the industrial production process has been associated with the exploitation of both natural resources and people. An issue is the general growth in awareness of consumers over the past three decades of the impact their consumption on human beings and nature. The concept of sustainability in fashion is a vital part of the approach currently being taken by parts of the apparel and textile industry for whom environmental consciousness is a part of marketing [27,28]. In particular, a growing number of sustainable clothing companies, such as American Apparel, Edun, and Gossypium, are striving to attract young consumers by producing fashionable clothes [29,30]. The principle motivating them is that of sourcing garments environmentally while providing good working standards and conditions for workers and ensuring a sustainable business model in the clothes' country of origin.

The leather industry has been traditionally considered a heavily polluting business, particularly in the tanning and finishing stages of the manufacturing chain [31]. Tanneries for leather production have become one of the major pollution-producing sectors in the industry. The disposal of tannery sludge is of great environmental concern, as tannery sludge has been classified as hazardous waste in the textile industry [32]. Furthermore, leather is obtained from the skins and hides of a variety of mammals, notably cattle, pigs, goats, and sheep. Most skins and hides are by-products of animals raised primarily for their meat or, in the case of sheep, their meat and wool [33]. As leather comes from animal skins and hides, it is renewable and is fully bio-degradable, but the millions of cows and other animals who are killed for their skin must endure the horrors of factory farming. Society has grown increasingly concerned about the treatment of farm animals due to changing demographics, the questioning of accepted human traditions, and changes in animal use [34]. Traditional societal pro-environmental standards for animal welfare and the laws embodying them (i.e., anti-cruelty laws) restrict the unnecessary infliction of pain and suffering of animals [35].

The International Cooperation (1999) established a research project called "Leather Production of the Future" to reduce the negative environmental impacts of leather production with a global

perspective. In addition, the United Nations Industrial Development Organization (2003) developed a methodological series of steps to help leather producers worldwide minimize the ecological impact of leather production. These methods include the treatment of waste, the efficient use of chemicals, the use of new bio-degradable chemicals for tanning, and having up-to-date equipment that can reduce effluent production and solid waste discharge. Due to the cruelty to animals involved in the production of natural leather and the pollution caused by the production of faux plastic leather, alternatives such as bio-degradable leather need to be researched and developed to protect the eco-system. However, apparel companies may struggle to sell pro-environmental and sustainable faux leather fashion items because of consumers' hesitancy when faced with newly developed sustainable options. Therefore, this study explores the behavioral intention to buy or use newly-developed E-FLA products as an important prerequisite to introducing them to real markets.

2.2. Theoretical Frameworks: Theory of Planned Behavior

The TPB theory considers not only volitional control but also non-volitional control in explaining an individual's behavior. A central factor of the TPB is the consideration of individual's intentions, which provides the most exact predictions of specific behaviors of an individual [36,37]. In this theory, intention, which is viewed as an immediate antecedent of behavior, represents an individual's readiness/willingness to engage in a specific behavior [16]. The TPB assumes three conceptual determinants of intention. Specifically, intention is based on variables such as the attitude toward the behavior, subjective norms, and perceived behavioral control. According to Ajzen and Fishbein [36], the attitude toward the behavior is the degree of an individual's positive or negative evaluation/appraisal of behavior performance. This attitude is based on prominent behavioral beliefs and outcome evaluations. Behavioral beliefs are one's perceptions of the probability of an expected outcome's occurrence because of engaging in a particular behavior, and outcome evaluations involve the assessment of the possible consequences of a specific behavior [36].

In the TPB model, an individual's perceived behavioral control is expected to be greater when he/she has important resources and opportunities [38]. Perceived behavioral control is based on the functions of control beliefs and perceived power. Control beliefs are the perceived presence (or absence) of resources and opportunities that facilitate (or impede) the performance of a behavior, and the perceived power of each control factor is the individual assessment of the significance of the resources and opportunities for accomplishing behavioral outcomes [39,40]. In the theory, the inclusion of perceived behavioral control with control beliefs increases the predictive power by accounting for intentions/behaviors that are not under complete volitional control or that stem from non-volitional factors [16,41].

Further, departing from his original stance, Ajzen (1991) [16] stated that "the theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account" (p. 199). More modifications to the theory have proposed the addition of pro-environmental obligations (e.g., [42–44]). The majority of research on sustainable consumption has focused on Western consumers. The drawbacks of previous research range from the unidimensional study of sustainable consumption beliefs and the limitation of the products studied to a few categories (primarily food). Thus, this study aims to demonstrate the multi-dimensionality of sustainable consumption beliefs as a factor affecting sustainable behavioral intentions related to apparel products among Asian consumers (specifically, in China and South Korea).

2.3. Proposed Modifications to the TPB

Although the TPB may be the most widely supported model, various additional modifications have been proposed. This study proposes further theoretical development of the TPB model within the context of sustainable apparel consumption.

Environmental Knowledge (EK): Knowledge is regarded as vital for successful action. Consistent with this idea, knowledge-based promotion and campaigns have continually been a popular means of encouraging certain behaviors, such as pro-environmental behaviors, among members of the public [45]. Knowledge is considered a means to overcome psychological barriers such as ignorance and misinformation. It is viewed as a necessary, though generally inadequate, precondition for successful action. In other words, although knowledge does not always have the intended effect on a target behavior itself, it may at least promote other mechanisms that facilitate behavior change [46]. Arcury and Johnson [18] described environmental knowledge as information that individuals have about the environment, the ecology of the planet, and the influences of human actions on the environment. A main assumption among researchers has been that an increase in knowledge will increase environmental concerns. Several studies have indicated that knowledge of environmental problems is related to environmental concern [47,48] and behaviors, such as preserving the Earth's resources [49].

Perceived Consumer Effectiveness (PCE): Perceived consumer effectiveness is defined as a domain-specific belief that the efforts of an individual can make a difference in the solution to a problem [20]. PCE is related to the concept of perceived behavioral control, which has been studied by theorists in the areas of helplessness, the locus of control and perceived control [50]. The common thread in these areas is that the subjects' actions and/or intentions are affected by the degree to which they believe the occurrence of an event can be affected by their actions [51]. According to Kim and Choi [52], people can develop a sense of ineffectiveness through witnessing failure by others and through their own experiences of failure or being out of control. The degree to which a person feels that he or she has little control over the performance of a behavior has been shown to significantly reduce behavioral intentions and behaviors, even under circumstances where attitudes and/or social norms toward the action are very favorable [39,53]. Similarly, PCE is expected to affect intentions and behavior if individuals believe that their behavior will or will not lead to the desired result.

Multi-dimensional Sustainable Consumption Beliefs (MSCB): The rise in concern among consumers worldwide about issues of sustainability, which encompasses environmental and social concerns, has been well documented in the marketing literature [54]. Sustainable consumption has become an important subject, since problems of environmental pollution, labor standards, animal welfare, and fair trade have risen to prominence [55]. However, despite the attention paid to the subject and the rising concern with sustainable issues in society, research has tended to neglect the multi-dimensional sustainable consumption beliefs in the apparel and textile industry. Many studies have explored environmental or green consumer concerns [56,57]. However, the evidence reveals that consumer concerns are no longer so narrow. The existence of broader, macro-level sustainability concerns was documented by Shaw et al. [58], where it was found that in addition to environmental concerns, consumers were concerned about areas including irresponsible selling, human beings' rights, and animal welfare issues. The current study considers other dimensions and multi-dimensional sustainability concerns including pro-environmentalism (PE) for nature-related issues, social responsibility (SR) for the rights of human beings, and animal conservation (AC) for animal welfare, focusing specifically on the roles and impacts of these sustainable consumption beliefs in consumer decision making.

Self-Enhancement in Sustainable Consumption (SE): Self-enhancement is defined as the positive emotion of achievement or satisfaction that a consumer expects to come from consuming products sustainably. According to Abdul-Muhmin [21], consumers may experience satisfaction from being able to contribute toward environmental conservation. This is among the perceived psychological consequences of pro-environmental behavior. Abdul-Muhmin [21] have indicated that this cognitive satisfaction experienced by consumers could affect pro-environmental behavioral intentions. Related to this concept, self-actualization motivations are those in which an individual seeks self-fulfillment and an enriching experience from sustainable consumption [59,60]. Drawing on Maslow's conception of a self-actualized individual, people with self-actualization motives are driven by the desire for growth, rather than (perceived) deficiency. They seek the experience for egoless, selfless, detached

reasons, so this fulfillment of needs has underlying altruistic motivations. A defining characteristic of this category of motivation is that individuals seek to help others rather than themselves, so improved welfare for others is a key outcome. Consumers who are concerned with sustainability may express altruism by, for instance, buying fair trade products to help poor people to have better lives. They may also prioritize products from companies that practice corporate social responsibility. In this way, they contribute to supporting companies that respect human and animal welfare and that are environmentally friendly.

Behavioral Intention (BI) to buy, use, and recommend E-FLA products: This notion is conceptualized as a consumer's readiness to act, or a positive predisposition to act, in a sustainable way. Environmental concern and perceived psychological consequences are the key hypothesized determinants of this concept. The expected positive effect of concern is based on empirical results that show that environmental concern positively influences the consumers' willingness to pay a premium for environmentally friendly product alternatives [21]. The indirect evidence from the theory of reasoned action (TRA) supports the hypothesized effect of perceived psychological consequences on willingness. If, as suggested by the TRA, salient consequences of behavior affect behavioral intentions, then the perceived psychological consequences of behavior should affect behavioral willingness. In other words, all things being equal, consumers who anticipate positive emotions of achievement or satisfaction derived from their own efforts toward protecting the environment should show more willingness to engage in sustainable actions than those who do not anticipate deriving such emotions.

Conceptual Framework and Hypotheses: Based on the theoretical and practical evidence reviewed in the preceding paragraphs, the hypotheses investigated in this study are summarized below:

Hypothesis 1 (H1). *Environmental knowledge has a positive effect on sustainable consumption beliefs (H1a, pro-environmentalism; H1b, social responsibility, H1c, animal conservation).*

Hypothesis 2 (H2). *Perceived consumer effectiveness has a positive effect on sustainable consumption beliefs (H2a, pro-environmentalism; H2b, social responsibility, H2c, animal conservation).*

Hypothesis 3 (H3). *Sustainable consumption beliefs (H3a, pro-environmentalism; H3b, social responsibility, H3c, animal conservation) have positive effects on the self-enhancement resulting from sustainable consumption.*

Hypothesis 4 (H4). *The self-enhancement resulting from sustainable consumption has a positive effect on behavioral intentions to buy, use, and recommend E-FLA products.*

Based on the review of the literature and hypotheses developed above, the authors created a conceptual framework to investigate the relationship among environmental knowledge (EK), perceived consumer effectiveness (PCE), sustainable consumption beliefs (SCB), self-enhancement resulting from sustainable consumption (SE), and behavioral intentions to buy, use, and recommend E-FLA products (BI), as shown in Figure 1.

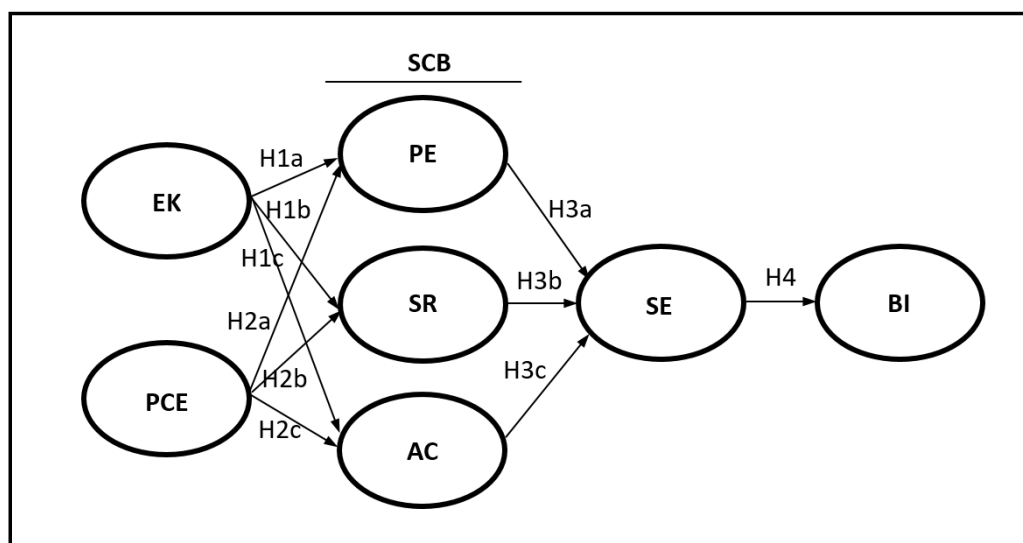


Figure 1. The sustainable consumption behavior model. AC, animal conservation; BI, behavioral intentions; EK, environmental knowledge; PCE, perceived consumer effectiveness; PE, pro-environmentalism; SCB, sustainable consumption beliefs; SE, self-enhancement resulting from sustainable consumption; SR, social responsibility.

3. Methodology

3.1. Instrument Development

The scales were adapted from previous studies to examine the associations proposed in the research model. Six items each were used to measure EK [61] and PCE [20], and sixteen items were used to measure SCB [62]. These were correspondingly adapted from previous studies. The measure for SE consisted of three items developed with reference to a previous study [21]. Before being asked about their behavioral intentions to buy, use, and recommend E-FLA products, respondents were shown images and explanations about E-FLA products, including the cruelty to animals caused by natural leather production and the environmental problems caused by the production of conventional faux leather products. After images and descriptions of E-FLA products related to a sustainable consumption perspective were shown to respondents, three items measuring the behavioral intentions [36] to buy, use, and recommend E-FLA products were presented, followed by demographic information questions. The items to measure EK, PCE, SCB, SE, and behavioral intentions to buy, use, and recommend E-FLA products were all presented with seven-point Likert-type scales (1 = strongly disagree; 7 = strongly agree).

3.2. Sample and Data Collection

A total of 450 respondents completed the survey, and the data were gathered from online respondents from China (N = 225) and Korea (N = 225) with participants aged between 20 and 40 years. The female sample was collected purposefully from the residences of the metropolitan areas of Shanghai and Beijing in China and Seoul in South Korea, and the participants were recruited through a qualified online survey firm. The sample is described as follows: 72.4% of the Chinese respondents indicated they were married and 53.8% of the Korean respondents indicated they were married; 54.7% of the Chinese had children and 47.6% of the Koreans had children; most of the respondents in both the Chinese (93.8%) and Korean (66.6%) groups had received undergraduate education; and the majority of the Chinese (87.5%) and Koreans (76%) perceived themselves as having a middle social status.

The general level of awareness of E-FLA products was examined: only 12.4% of the Chinese respondents and 5.8% of the Koreans were aware of them; 64.9% of the Chinese respondents and 47.6% of the Korean respondents had heard about E-FLA products; 22.7% of the Chinese respondents and

46.7% of the Korean respondents had no idea about them. Only one-third of the Chinese respondents (31.5%) and 11.1% of the Korean respondents had purchased general E-FLA products, which indicates a low level of acceptability of E-FLA products in both countries. For the respondents who answered that they had purchased general E-FLA products, most (71.4% in China and 72% in Korea) had bought a fashion item (Table 1). Thus, general E-FLA products have entered the early adoption stage of product diffusion in both countries.

Table 1. Profiles of Chinese and Korean respondents.

Variable	Chinese		Korean		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Age						
20	75	33.3	75	33.3	150	33.3
30	75	33.3	75	33.3	150	33.3
40	75	33.3	75	33.3	150	33.3
Marital status						
Married	163	72.4	121	53.8	284	63.1
Single	62	27.6	104	46.2	163	36.2
Children						
Yes	123	54.7	107	47.6	230	51.1
No	40	22.4	17	7.6	57	12.7
Final educational level						
Middle school	1	0.4	2	0.9	3	0.7
High school	10	4.4	43	19.1	53	11.8
Undergraduate	3	1.3	30	13.3	33	7.3
Graduate	211	93.8	150	66.6	361	80.3
Social status						
High-high	0	0	1	0.4	1	0.2
High-low	6	2.7	4	1.8	10	2.2
Middle-high	75	33.3	55	24.4	130	28.9
Middle-low	122	54.2	116	51.6	238	52.9
Low-high	18	8.0	43	19.1	61	13.6
Low-low	4	1.8	6	2.7	10	2.2
Awareness of E-FLA products						
Familiar with it	28	12.4	13	5.8	41	9.1
Have heard about it	146	64.9	107	47.6	253	56.2
Have no idea about it	51	22.7	105	46.7	156	34.7
Purchase experience of E-FLA products						
Yes	71	31.5	25	11.1	116	25.8
No	154	68.5	200	88.9	334	74.2
Previous purchase items of E-FLA products ^a						
Fashion products	65	71.4	18	7.2	83	71.6
Home furnishing (i.e., sofa)	14	15.4	6	2.4	20	17.2
Case cover for tablet, PC, or cellphones	12	13.2	1	0.4	13	11.2
Willingness to pay a higher price for E-FLA products						
Not willing	75	33.3	65	28.9	140	31.1
Less than 10% ^b	117	52.0	104	46.2	221	49.4
Less than 20%	28	12.4	42	18.7	70	15.6
Less than 30%	4	1.8	12	5.3	16	3.6
Over 30%	1	0.4	2	0.9	3	0.7

^a: more than one answer; ^b: the percentage of faux leather apparel's original sales price; E-FLA, Eco-friendly Faux Leather Apparel.

4. Results and Analysis

4.1. Internal Consistency, Item Analysis, and Exploratory Factor Analyses

To test the unidimensionality of the latent constructs, an exploratory factor analysis (EFA) was conducted [63]. The EFA on each construct showed a single underlying factor for each construct. In addition, the Cronbach's alpha scores, which ranged from 0.75 to 0.90, showed a satisfactory level of construct reliability [64].

4.2. Measurement Model

The latent variables were constructed and then tested in a measurement model employing a confirmatory factor analysis (CFA). The results of the measurement model demonstrated that the dimensionality of each construct was well identified. The model generated satisfactory fits, and all factor loadings were statistically significant. By means of the AMOS 18.0 statistical program, CFA was performed to estimate the measurement model, following Anderson and Gerbing's [65] two-step approach. The original measurement model analysis, including 34 items, indicated that the model fit was not satisfactory, and the model needed improvement. A series of scale purification processes [66] was used to remove 13 items, including three items for EK, three items for PCE, and seven items for SCB. The final measurement model generated an acceptable fit: $\chi^2 = 344.16$, $df = 164$, $\chi^2/df = 2.09$, $p < 0.001$, CFI = 0.96, GFI = 0.93, AGFI = 0.91, NFI = 0.93, RMSEA = 0.04, RMR = 0.06, and all coefficients were significant.

The convergent validity of the constructs was supported by a significant t-value of each item's estimated path coefficient on its posited latent construct [67,68]. All estimated path coefficients had t-values that were significant at the $p < 0.05$ level. The average variance extracted (AVE) of each construct exceeded the cutoff of 0.5, also supporting the convergent validity of each scale [69]. The CFA factor loadings (all above 0.6) were all in the acceptable range, suggesting the unidimensionality of each construct [68] (Table 2). As this study expected, each unidimension of EK, PCE, SE, BI relating to E-FLA products, and three dimensions of SCB were identified. The discriminant validity was supported as the AVE between each pair of constructs was greater than Φ^2 (i.e., the squared correlation between two constructs) (see Table 3).

Table 2. Exploratory factor analysis and confirmatory factor analysis results of measures.

Factors and Items	EFA		CFA		
	Factor Loading	Factor Loading	t-Value	CR	AVE
Environmental knowledge (EK)				0.77	0.61
The production processes of synthetic or manufactured fiber products such as polyester can cause environmental pollution.	0.85	0.82	- ^a		
Environmental pollution can occur because of harmful gas or waste generated by the disposal process of apparel products.	0.83	0.70	14.63		
Dyeing and finishing processes used to produce textiles and clothing waste a lot of water.	0.83	0.82	16.73		
Eigen value	2.10				
Variance %	70.14				
Cronbach alpha	0.79				
Perceived consumer effectiveness (PCE)				0.78	0.65

Table 2. Cont.

Factors and Items	EFA		CFA		
	Factor Loading	Factor Loading	t-Value	CR	AVE
One person telling others about the seriousness of environmental damage can help to solve environmental problems.	0.90	0.80	-		
The behavioral effort of one person can change a society.	0.90	0.80	17.23		
The buying behaviors of one person have effects on the whole society.	0.81	0.81	17.40		
Eigen value	2.28				
Variance %	75.30				
Cronbach alpha	0.84				
Sustainable Consumption Beliefs (SCB)					
Pro-environmentalism				0.74	0.61
We must consider environmental consequences when purchasing products.	0.78	0.79	-		
I think that we should purchase an eco-friendly product even though it costs a bit more.	0.75	0.79	17.11		
It is important for me that we try to buy eco-friendly products to protect the environment.	0.73	0.76	16.51		
Eigen value	7.56				
Variance %	41.97				
Cronbach alpha	0.82				
Social responsibility				0.75	0.55
I think that the protection of employees' rights should be government regulated.	0.79	0.77	-		
I think that sales of products made by child labor should be forbidden.	0.76	0.68	13.52		
I think that we should buy fairly-traded goods for the good of our society.	0.65	0.77	15.11		
Eigen value	1.77				
Variance %	9.80				
Cronbach alpha	0.70				
Animal conservation				0.67	0.51
I feel guilty that animals have died because of human beings' consumption.	0.81	0.64	-		
For animal welfare, I think that we should not purchase products made by animals.	0.75	0.72	11.80		

Table 2. Cont.

Factors and Items	EFA		CFA		
	Factor Loading	Factor Loading	t-Value	CR	AVE
I think we should oppose production involving animal testing processes because animals are important within the ecological system.	0.75	0.78	12.30		
Eigen value	1.05				
Variance %	5.86				
Cronbach alpha	0.77				
Self-enhancement of sustainable consumption behavior (SE)				0.76	0.59
I feel a sense of achievement about my personal image when I consume pro-environmental products.	0.85	0.74	-		
I feel a sense of emotional satisfaction when I consume sustainably.	0.84	0.73	14.50		
I think that my spiritual value improves when I consume sustainably.	0.83	0.84	16.28		
Eigen value	2.13				
Variance %	71.12				
Cronbach alpha	0.84				
Behavioral intention to buy, use, and recommend E-FLA products (BI)				0.88	0.77
I intend to use this product.	0.92	0.84	-		
I intend to buy this product.	0.94	0.91	24.02		
I intend to recommend this product to other people.	0.91	0.88	23.05		
Eigen value	2.55				
Variance %	85.04				
Cronbach alpha	0.91				

CR, composite reliability; AVE, average variance extracted, ^a: Unstandardized estimates were fixed by a value of one, so a t-value is not given.

Table 3. Correlation of constructs.

	EK	PCE	SCB			SE	BI
			PE	SR	AC		
EK	1.00						
PCE	0.36	1.00					
PE	0.50	0.47	1.00				
SR	0.45	0.47	0.46	1.00			
AC	0.48	0.45	0.43	0.49	1.00		
SEEC	0.48	0.50	0.50	0.59	0.57	1.00	
BI	0.38	0.53	0.56	0.48	0.40	0.53	1.00

EK, environmental knowledge; PCE, perceived consumer effectiveness; SCB, sustainable consumption beliefs; PE, pro-environmentalism; SR, social responsibility; AC, animal conservation; SE, self enhancement; BI, behavioral intention to buy, use, and recommend E-FLA products.

The measurement invariance between the Chinese and the Korean groups was tested by multi-group CFA (Table 4). An examination of the chi-square differences between a constrained versus an unconstrained model revealed that the conditions of metric (i.e., measurement weight) and scalar (i.e., structural covariance) invariance were satisfied in all latent variables of the proposed model. Thus, the two groups of the sample demonstrated measurement invariance, which means the proposed model can test the hypothesized relationships, and the moderating role of country (China and South Korea) can also be tested [70].

Table 4. Measurement invariance test results.

	Model Fit Measures				Model Differences	
	χ^2	Df	p	RMSEA	CFI	$\Delta\chi^2(\Delta df)$
Configural invariance	602.95	328	0.00	0.04	0.95	-
Metric invariance	609.58	342	0.00	0.04	0.95	6.63(14)
Scalar invariance	661.58	370	0.00	0.04	0.94	58.64(42)
Factor covariance invariance	717.25	395	0.00	0.04	0.94	131.25(67) ***

*** $p < 0.001$.

4.3. Hypothesis Testing: Validating Sustainable Consumption with the TPB Model

Structural equation modeling (SEM) analysis was used to examine the hypothesized relationships. The structural model identified two variables (EK and PCE) as exogenous latent constructs, and the other variables (PE, SR, AC, SE, and BI) were given as endogenous constructs. The hypothesized structural model showed a suitable fit ($\chi^2(df) = 393.72(167)$, CFI = 0.96, GFI = 0.92, AGFI = 0.91, NFI = 0.92, RMSEA = 0.05, RMR = 0.07).

H1 was concerned with whether EK has positive influences on the three dimensions of SCB (PE, H1a; SR, H1b; AC, H1c). EK was shown to strongly affect all SCB dimensions in this study: PE ($\beta = 0.30$, $p < 0.001$), SR ($\beta = 0.43$, $p < 0.001$), and AC ($\beta = 0.39$, $p < 0.001$). Thus, H1 was supported, indicating the significance of EK in formulating SCB. Environmental knowledge is a necessary antecedent factor of an individual's pro-social consciousness and behavior (Frick et al., 2004). H2 was concerned with whether PCE has positive effects on the three dimensions of SCB (PE, H2a; SR, H2b; AC, H2c). PCE was shown to robustly affect all SCB dimensions in this study: PE ($\beta = 0.59$, $p < 0.001$), SR ($\beta = 0.41$, $p < 0.001$), and AC ($\beta = 0.38$, $p < 0.001$). Thus, H2 was supported, indicating the significance of PCE in creating SCB. Consumers have sustainability concerns and beliefs when they think their efforts can have effects on the whole society [20].

H3 was concerned with whether the dimensions of SCB (PE, H3a; SR, H3b; AC, H3c) positively affect SE. The results showed that, among the three SCB dimensions, PE ($\beta = 0.53$, $p < 0.001$) and SR ($\beta = 0.34$, $p < 0.001$) had positive significant effects on SE, while AC ($\beta = 0.04$, $p > 0.05$) had no effect on SE. Therefore, H3a and H3b were supported and H3c was rejected. H4 was related to the positive effect of SE on BI to buy, use, and recommend E-FLA products. SE was shown to significantly affect BI to buy, use, and recommend E-FLA products ($\beta = 0.69$, $p < 0.001$). Hence, H4 was supported. In generating consumer intention to use, buy, or recommend E-FLA products to others, SE was the determinant in the sustainable consumption for Chinese and Korean consumers. In sum, nine of the hypotheses proposed in the present study were supported, which suggests that the TPB model is compatible with Asian sustainable consumption behavior. Based on the results, the TPB was able to detail the determinants of an individual's decision to carry out sustainable behaviors related to apparel purchase, consistent with previous research focusing on other areas.

4.4. Country Differences between China and South Korea

To investigate the moderating effect of respondents' nationality between China and South Korea, multi-group structural equation modeling (MGSEM) was conducted. The identification of the measurement invariance between the two respondent groups was necessary before MGSEM could be carried out. The unconstrained model assumed that the invariance had the same factors and path pattern in the two country estimations. The fit of the unconstrained model was shown to be satisfactory ($\chi^2(df) = 602.24(326)$, CFI = 0.95, GFI = 0.90, NFI = 0.90, RMSEA = 0.04, RMR = 0.08), with a statistically significant t -value for factor loadings exceeding 0.60. The full invariance model was tested by constraining the metric of the factor loading (measurement weight) to be invariant across the two countries. There were no significant differences in the chi-square value ($\Delta\chi^2(\Delta df) = 7.16(14)$, $p > 0.05$) between the unconstrained model and the measurement weight-constrained model ($\chi^2(df) = 609.39(340)$, CFI = 0.95, GFI = 0.89, NFI = 0.89, RMSEA = 0.04, RMR = 0.08). Therefore, metric invariance was supported, and the two countries' structural models were found to be invariant.

Upon validation of the measurement invariance between the Chinese and Korean groups, MGSEM was carried out to compare the hypothesized relationships between the two consumer groups. The Chinese consumers' sustainable consumption was motivated by pro-social values and multi-dimensional sustainable consumption beliefs and self-enhancement along three paths: from EK through PE and then through SE to BI to buy, use, and recommend E-FLA products; from EK through SR and then through SE to BI to buy, use, and recommend E-FLA products; and from PCE through PE and then through SE to BI to buy, use, and recommend E-FLA products (see Figure 2 and Table 5).

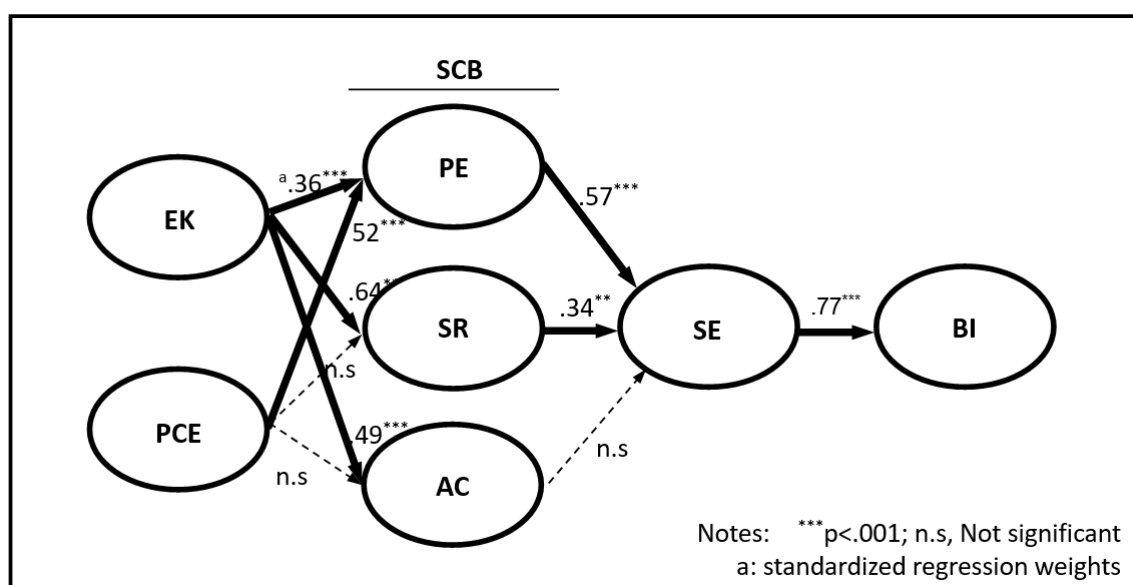


Figure 2. Chinese sustainable consumption behaviors.

The Chinese group showed sustainable consumption beliefs including PE and SR arising from EK and PE stemming from PCE. PE and SR were found to be important determinants in generating the emotional feeling of enhancement or satisfaction with sustainable consumption. The AC of consumers' sustainable consumption beliefs may not be a positive determinant for raising SE in China. The mediation effects of PE and SE were shown to lead to BI to buy, use, and recommend E-FLA products.

The South Korean group's sustainable consumption intentions related to E-FLA products occurred along four paths, showing both similarities and differences between the Chinese and South Korean samples: from EK through PE and then through SE to BI; from EK through SR and then through SE to BI; from PCE through PE and then through SE to BI; and from PCE through SR and then through SE to BI (see Figure 3 and Table 5).

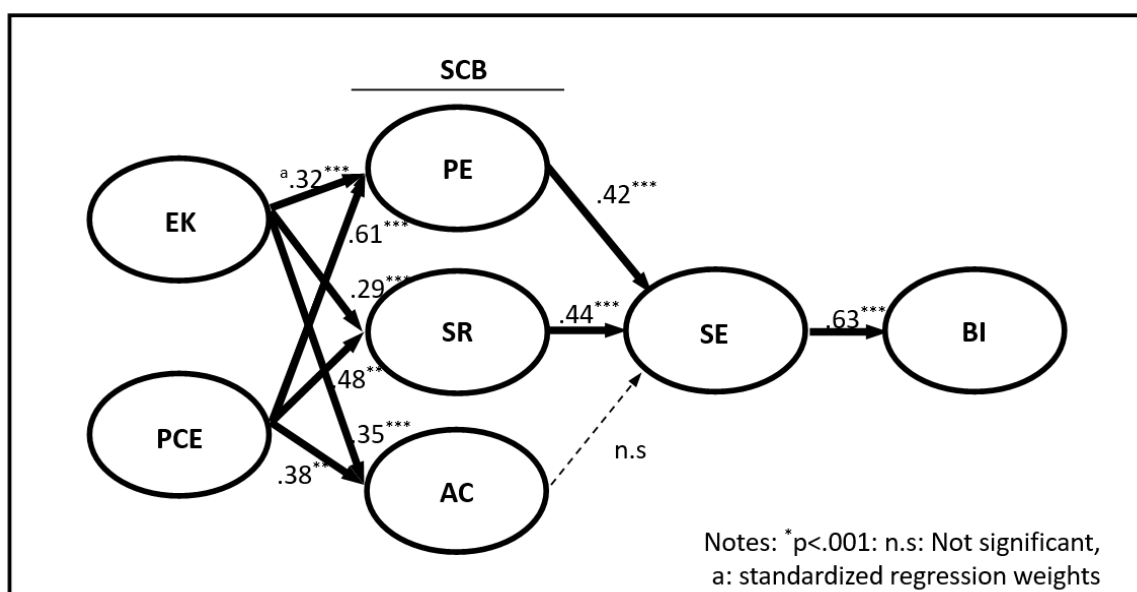


Figure 3. South Korean sustainable consumption behaviors.

Table 5. Path coefficients for Chinese and South Korean respondents.

Hypothesized Relationships	Chinese			Korean		
	β	SE	CR	β	SE	CR
H1a: EK→PE brand resonance e U.t the country image-brand resonance model would facilitate consumers	0.36	0.08	4.74 ***	0.32	0.08	4.34 ***
H1b: EK→SR	0.64	0.08	7.11 ***	0.29	0.06	3.85 ***
H1c: EK→AC	0.49	0.09	4.95 ***	0.35	0.07	4.18 ***
H2a: PCE→PE brand resonance e U.t the country image-brand resonance model would facilitate consumers	0.52	0.08	6.61 ***	0.61	0.10	7.16 ***
H2b: PCE→SR	0.04	0.07	n.s	0.48	0.07	5.58 ***
H2c: PCE→AC	0.07	0.08	n.s	0.38	0.08	4.47 ***
H3a: PE→SE	0.57	0.07	6.94 ***	0.42	0.08	4.60 ***
H3b: SR→SE	0.34	0.08	4.48 ***	0.44	0.11	4.57 ***
H3c: AC→SE	0.02	0.07	n.s	0.09	0.08	n.s
H4: SE→BI to E-FLA products	0.77	0.10	7.68 ***	0.63	0.11	6.08 ***

Notes: β , the path coefficient; SE, standard error; CR, critical ratio; *** $p < 0.001$; n.s, not significant.

The mediation roles of PE and SR and SE were shown to lead to positive BI to buy, use, and recommend E-FLA products. The Korean group demonstrated sustainable consumption beliefs including PE and SR arising from both EK and PCE. PE and SR were found to be significant factors in generating the emotional feeling of enhancement or satisfaction with sustainable consumption. The AC of consumers' sustainable consumption beliefs may not be a positive determinant for increasing SE in South Korea, similar to the results for China. The mediation effects of PE, SR, and SE were shown to lead to BI to buy, use, and recommend E-FLA products in the South Korean group.

5. Discussion and Conclusions

Following on from the evolution of bio-based polyurethane and nanocellulose techniques, eco-friendly leather apparel (E-FLA) has been newly developed as a pro-environmental and

animal-protective leather alternative for the Chinese and Korean apparel and textile marketplaces. This study examined the sustainable consumption behavior intentions to buy, use, and recommend E-FLA products following the theory of planned behavior approach, in which eco-friendly consumers attain environmental knowledge and perceive consumer effectiveness, form sustainable consumption beliefs, and use these beliefs to determine their willingness to buy, use, and recommend E-FLA products. Indeed, the TPB approach to understanding sustainable consumption behavior has been theoretically validated within a cultural-individual perspective. The cultural discrepancies and similarities are noteworthy when sustainable consumption beliefs indicate different directions for sustainable consumption decision-making.

First, the dimensionality of the modified TPB framework was demonstrated in the three dimensions of sustainable consumption beliefs and the unidimensions of environmental knowledge of apparel, perceived consumer effectiveness, self-enhancement of sustainable consumption behavior, and behavioral intention to buy, use, and recommend E-FLA products. The results indicated that environmental knowledge of apparel and perceived consumer effectiveness motivate positive perceptions of pro-environmentalism and social responsibility and result in a willingness to buy, use, and recommend E-FLA products. In particular, when pro-environmental and socially responsible consumers have emotional feelings of achievement from consuming pro-environmentally, they are likely to have positive behavioral intentions to buy, use, and recommend E-FLA products.

Second, the results support most of the hypotheses. Environmental knowledge and perceived consumer effectiveness were shown to lead to positive sustainable consumption beliefs, but no significant impact of a conspicuous value was found. However, a conspicuous value was found to lead to a desire for pro-environmental or pro-social behaviors, particularly, if eco-friendly products were expensive [71]. The nature of the E-FLA products might involve connotations of being cheaper or of lower quality than natural leather products. From another point of view, in the sustainable consumption context, consumers form their beliefs based on intrinsic perspectives rather than on the social context. Vitell et al. [72] found that consumers are guided more by values than by consequences when making sustainability-oriented decisions. Values are considered to be the one of the most abstract forms of individual knowledge. Therefore, tying a specific product, service, or idea to a value increases the ease with which the specific item can be stored and remembered [73]. Self-enhancement in sustainable consumption behavior positively mediates sustainable beliefs and behavioral intentions. A feeling of satisfaction is an efficient motivation for creating sustainable consumption behavioral intentions to buy, use, and recommend E-FLA products.

Third, this study reveals the cultural disparities in relation to the TPB framework between China and Korea, suggesting the need for further research in marketing E-FLA to these two countries. A conclusion consistent with the findings related to both countries assessed in this study is that the TPB framework is a relevant theoretical and practical model for both countries for understanding and predicting the marketability of E-FLA products. The discrepancy is founded on the emphasis in each country with regard to the TPB construct: Chinese consumers actively use their EK to advance their positive behavioral intentions, while Korean consumers employ both EK and PCE to avoid uncertainty in their decision-making processes.

6. Limitations and Future Research

Given the lack of current literature related to sustainable consumption practices in the clothing and textiles area, the results presented here provide a theoretical foundation for a systemic approach for analyzing people's consumption processes by applying the TPB model. However, due to the exploratory nature of this study, a number of drawbacks limit the generalization of its findings. First, the use of purposive sampling limits the generalization of the research, as this study restricted the sample frame to specific residence areas and age samples. Therefore, the sample may not be representative of the whole population of sustainable product users. In addition, due to growing interest in North Korea worldwide, a sample from North Korea, whose database has been very limited previously, will hopefully be collected

in future research. Second, there might be some differences in sustainable consumption behaviors based on demographic factors including age, gender, occupation, and marital status. Further research needs to explore interactions between sustainable consumption and other demographic factors or consumer characteristics (i.e., sustainable consumption experience) or marketing perspectives (i.e., information about faux leather products such as eco-labels). Third, although this study applied the TPB model for understanding consumers and their connected perceptions, other business considerations such as fair-trade resources, pricing components, implementation, capabilities, and sustainability could be examined to measure business performance. Lastly, cultural and case-specific discrepancies must be considered before the study results are extended to other cultural and industry contexts.

Beyond these limitations, there are various implications for future research. Given the growing interest in sustainable consumption from societies, industries, and consumers, comprehending these dynamics can allow policy enforcers, marketers, and researchers to devise appropriate ideas and practical applications of E-FLA product stewardship and to present them to academia and industries. This cross-cultural study focusing on sustainable consumption behavior demonstrates the current understanding, evaluation, and potential appropriation of alternative consumption practices.

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