감성과학
제25권 2호, 2022
<연구논문>

pISSN 1226-8593
eISSN 2383-613X
Sci. Emot. Sensib.,
Vol.25, No.2, pp.55-70, 2022
https://doi.org/10.14695/KJSOS.2022.25.2.55

Substitute Textile Preferences for Eco-Friendly Leather Goods: Focusing on Shoes and Bags

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Abstract

In the 21st century, the demand for eco-friendly leather, such as eco-leather and vegan leather, is steadily increasing. This study examines the influence of eco-friendliness on consumers' purchasing intentions and the possibility of eco-friendly changes in the fashion accessory market, which is dominated by leather material and leather substitutes. This study administered a questionnaire survey to 227 males and females between 20 and 60 years of age in Korea. With a 5-point Likert scale, data were collected on evaluation criteria when purchasing shoes and bags and purchasing intention of various leather substitute materials according to the democratic variables. The eco-friendliness attitude was divided into eco-consciousness and green behavior. As the eco-friendly attitude increased, most purchasing standards increased, but the purchasing criteria, such as trends, brands, and prices, did not correlate with the eco-friendly attitude. The eco-consciousness of a consumer had a high correlation with the design evaluation criteria, while the green behavior of the consumer aligned with durability and comfort criteria when purchasing a bag. There was a preference for recycled leather, vegetable leather, synthetic leather, and chemical leather, and the fabric type was ranked as natural fiber, biodegradable fiber, and synthetic fiber. Consumers with both green behavior and eco-consciousness are more likely to purchase biodegradable textiles and vegetable leather for the material of shoes and bags.

Key words: Eco-friendly Leather, Vegan, Sustainability, Purchasing Intention

1. INTRODUCTION

The fashion industry has been cited as one of the most polluted industries in the world, and its seriousness has steadily emerged. Clothing requires the use of a lot of land, water and energy, from the cultivation of raw materials to processing, distribution, and inventory disposal. Since the advent of fast fashion, people consume more clothes than they need, they are easily thrown away, resulting in huge overproduction and waste. However, as climate change and resource depletion accelerate, and consumers gradually become aware of the seriousness of environmental problems, interest in the sustainable fashion industry is remarkably increasing in recent years.

The concept of sustainable management is expanding its scope of application not only to the series of production processes of the production and disposal of consumer goods, but also to various communication areas that deliver it to consumers (Son & Yoon, 2016). Recently, the Millennial Generation (1981~1996) emerged as a major consumption target and the consumption trend of 'sustainability' became a huge trend. Since

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COVID-19, eco-friendly fashion companies have grown significantly, and they are replacing raw materials used in fashion products with so-called ‘eco’ materials.

In the fashion industry, the movement to minimize environmental damage that can occur in all production processes, the problem of depletion of resources due to indiscreet use, interest in naturals, and the importance of developing eco-friendly and sustainable materials are emerging (Han et al, 2011). Leather can be thought of as one of the controversial materials for harmfulness to humans and the environment in the fashion industry. Leather is widely used as a material for making fashion products such as clothes, bags, and shoes with features such as excellent durability, luxurious texture, and soft touch. Fashion companies are constantly inducing the purchase of new leather products according to the trend. This is because it plays a symbolic role that satisfies not only functional and aesthetic elements, but also the desire to show off. However, despite the fact that leather is a natural, it causes air pollution and water pollution due to a large amount of chemicals used in the processing of leather, which adversely affects the environment and human health. It has a serious problem with ethical problems such as animal cruelty (Yoon & Lee, 2018).

Shoes and bags are products that are used more of leather than clothing due to their characteristics. It was difficult to find substitutes for shoes and bags because they can receive a lot of functional help by using leather material that has the property of softly wrapping the contents. However, recently, with the development of eco-friendly methods and biotechnology, textiles that minimize damage to the environment while reproducing the advantages of natural leather are being released.

This study examines the interests of fashion accessories consumers in Korea on environmental issues and their effects on the evaluation criteria of fashion accessories. In addition, it is statistically revealed how the proposed leather and its substitute materials affect the purchase intention of consumers of fashion accessories. In order to achieve this research purpose, this study investigated the types and characteristics of eco-friendly leather through prior research, internet news articles, and inquiries to fashion companies.

Based on the results of literature research, a model for this study was derived and a questionnaire for empirical research was produced. This study presents implications, limitations, and future research directions through analysis of the results. This study examines the degree of interest in environmental issues according to gender and age among demographic factors. Accordingly, it is intended to support efficient marketing activities of companies by identifying evaluation factors when purchasing fashion accessories. At the same time, it aims to provide basic data that can be used for the sustainability of the fashion accessories industry by finding out the types of eco-friendly leather materials that consumers prefer.

2. THEORETICAL BACKGROUND

2.1. Classification by processing method of leather material

Leather collected from animals is perishable, so it must undergo a processing procedure to convert it into a stable material that can be used in the production of products. Tanning plays the role of physically and chemically reacting the structure of collagen in the raw material to remove moisture between fibers and to bond fibers and fibers. This tanning method of processing raw hide and skin determines the characteristics and quality of the leather. In modern times, it can be classified into vegetable tanned leather processed using a material extracted from vegetable fibers and chrome tanned leather using a dye containing a metal called chrome.

Vegetable leather is a skin tanned using tannin, a material obtained by extracting astringent ingredients from the bark, branches, roots, and fruits of a tree. Compared

to chrome leather, the process is more complicated and requires a lot of labor, so labor and production costs are high. However, because it uses vegetable raw materials, it is eco-friendly, and the leather is less damaged, so the pattern of the leather is revealed. The scratches and wrinkles on the leather surface are noticeable, and the color expression is limited, making it difficult to implement a bright color like white. The amount of use has decreased due to a problem of price or time, but as environmental issues have emerged recently, it is attracting attention again with the image of high-quality leather, and it is called 'eco leather'.

Chrome leather is a method invented with the development of a new emulsion in the 19th century, and is a method of dipping leather in chrome and then transitioning to vat. As leather can be mass-produced by simplifying the cumbersome tanning process, it is used in most leather products (80% to 90%) around the world. However, chromium has been found to be a source of harmful heavy metal contamination. As considerable heavy metals remain in the leather, there is a concern that it may adversely affect the human body as well as the environment.

2.2. The impact of leather on the environment

Although leather is a natural, most of the chemicals used in leather processing cause great environmental pollution, and its toxicity harms the human body as well. Chrome is known to be one carcinogens that can cause dermatitis, genetic damage, and cancer when it comes into contact with the skin. It is highly irritating and can cause disorders of the respiratory mucosa. In addition, preservatives such as pentachlorophenol or form-aldehyde are used to prevent spoilage of the leather, and form-aldehyde is also classified as one carcinogens.

For example, in Kanpur, India, where tanning factories are concentrated, 50 million liters of highly toxic water is produced every day, about 80% being discharged untreated. It is said that chronic diseases such as heart disease, tuberculosis, asthma and skin discoloration are prevalent in residents near the factory. Because of these hazards, the government regulated that the amount of chromium in leather products should not exceed a certain level, classified as industrial waste, and designated that it cannot be landfilled or incinerated. Leather waste, which was mostly disposed of by sea dumping, was also banned from sea dumping after the London Convention in 2009, and it is urgent to take measures.

2.3. Examples of eco-friendly leather

2.3.1. Vegetable tanned leather

Vegetable tanned leather refers to the tannage, or method of tanning the cowhide into leather. It's called 'vegetable' because of the naturals used in the tanning process like tree bark. Vegetable tanning or veg tan as it's sometimes called, is one of the oldest methods of tanning known to man (Wayne, 2021). It has literally been around for centuries. But less than 10% of the world's leather is tanned this way today. What makes vegetable tanning so unique is it allows us to use thicker leather and results in more body and character - perfect for bag making. Vegetable tanned leather also tends to age better and develops a rich patina over time. And it has that awesome classic leather smell.

A representative production plant that insists on traditional vegetable tanning that requires time and care is the Italian Vegetable Leather Tenorie Association (Vera Pelle). It started in 1994 as an association of 11 factories working on vegetable tanning, but now it has grown to more than 20 tanneries. Here, strict production technology regulations are observed that do not use toxic substances such as azoic dyes, nickel, pentachlorophenol, and chromium, which are harmful to humans and the environment. Animals are not slaughtered for the purpose of obtaining skin, but only by-products left over from the food industry are used. It helps to make the most of various materials generated during processing

in areas such as fertilizers and reduced materials so that leather can be easily recycled even after the end of its life. It provides a quality guarantee that can only be used by manufacturers who purchase leather here, which can be verified by end consumers.

2.3.2. Recycled leather

Recycled leather is a composite of shredded discarded leather collected from the manufacturing of clothes, shoes, boots, handbags, furniture etc. These shreds are then mixed together with a binding agent and produced into sheets of different thicknesses and then coated into any given colour. Different textures can be added for a tactile smooth finish or an interesting textured look.

ATKO Planning, a recycled leather company, has developed eco-friendly dry processing technology. This complemented the existing wet recycled leather that required a large amount of water and equipment. The Recycled Leather Thread (ATKO 4000) developed in 2018 is a method of extracting leather fibers from waste leather. Since it does not contain heavy metals, it does not cause secondary soil pollution even when discarded.

2.3.3. Biodegradable leather

The leaves of plants such as mulberry, pineapple, and cactus are made of fibers and then specially processed to give a leather-like texture, making it a sustainable and eco-friendly vegan material. It does not require extra land, water, fertilizers or pesticides for the production of raw materials, and is biodegradable without releasing toxicity even when discarded. A different approach to waste utilization is to take the leaves of the plant and use this as fiber to create textiles (Wood, 2019).

Pinatex® uses this principle, taking waste pineapple leaves from food production in the Philippines and processing these into fiber via a manufacturing unit in Spain (Wood, 2019). Pinatex® uses this principle, taking waste pineapple leaves from food production in the Philippines and processing these into fiber via a manufacturing unit in Spain (Amalia et al., 2019). Pinatex is a durable and fashionable vegan leather made from pineapple fibers and it is light, breathable, uses waste, and is not toxic in the tanning process (Amalia et al., 2019).

At the same time, Pinatex is tested for the following indicators according to ISO international standards: tear strength, tensile strength, light and color fastness and wear resistance. Pinatex 1㎡ per 16 pineapples can be obtained, and more than 40,000 tons of leaves and stems a year discarded from pineapple harvest in the Philippines can be utilized. Global brands such as HUGO BOSS and Puma are using Pinatex instead of animal skins to create sustainable footwear.

2.3.4. Bio leather

Biofabrication, which uses natural molecular components to make materials from proteins, is a method of manufacturing materials that resemble natural leather. It does not sacrifice animals, but is essentially made of the same elements as real skin. Rather, it is possible to express various performances and textures, such as giving stronger or improved flexibility than conventional leather through technical manipulation. In addition, there are many parts that are discarded after cutting into an irregular shape in real leather, but bio-leather has the advantage of being able to use the material more efficiently because it can be produced in a specific shape according to an order.

The most representative one is ZOA leather of Modern Meadow, a biotech company based in New York. It was bioengineered by cultivating a yeast strain that produces collagen when sugar is supplied, and it reproduces the texture of the material so that it is difficult to distinguish it from real leather. However, bio-leather is in the research and development stage so far, and it was excluded from the design of this study because it is difficult for Korean fashion goods consumers to access it.

2.4. Sustainability in fashion

With the textile industry satisfying steadily increasing consumption levels, excessive usage of valuable natural resources provokes a major environmental footprint: 118 billion cubic meters of water are expected to be utilized for global clothing production in 2030 (Rausch & Kopplin, 2021). Therefore, the consumer's clothing consumption behavior needs to be converted to a more sustainable behavior.

In the context of clothing, sustainability means that negative ecological impacts as well as impairments of the living conditions of workers, users, and all parties affected in any manner are precluded, both now and in the future and for the entire textile chain, that is, in all phases of the production, use, reuse, and recycling of clothes as well as in the treatment and handling of clothing waste (Kleinhueckelkotten & Neitzke, 2019). In the pursuit of a sustainable fashion system (meaning ethically and ecologically sound production and consumption practices based on real demand), even more changes and actions are needed at different societal levels: legislation, infrastructure, technology, education, business, design and consumption (Karell, & Niinimäki, 2020).

3. RESEARCH METHOD

3.1. Research problem

Hypothesis 1. The degree of interest in environmental issues differs according to demographics.

1-1. Women are more interested in environmental issues than men.

1-2. The younger the age, the higher the degree of interest in environmental issues.

Hypothesis 2. Depending on the degree of interest in environmental issues, the evaluation criteria for fashion accessories when purchasing is different.

Hypothesis 3. The purchase intention differs depending on the manufacturing method of eco-friendly leather presented in the product.

3.2. Research design

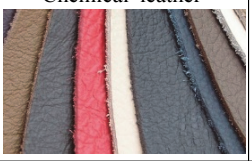
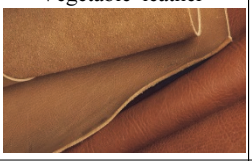
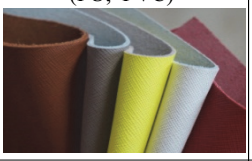
This is a study on the influence of the eco-friendliness of leather on the purchase intention of fashion accessory consumers in Korea. This study categorized consumers of Korean of fashion accessories according to demographic factors and environmental issues. In this study, an experiment was conducted to find out how it affects purchase intentions by suggesting various leathers and alternative materials used in fashion accessories. The photographs, simple features, and advantages and disadvantages of 7 types of leather and alternative materials selected through literature research are presented.

The main contents of the experiment are questions about consumers' interest in environmental issues and their purchase intentions for 7 types of textile materials. Through a prior study (Bang, 2003; Yoo & Kim, 2012) on shoes and bags 8 items were selected by referring to items on attributes or product evaluation criteria that are important to consider when purchasing each item. Based on the research related to the attribute evaluation of eco-friendly fashion products (Moon & Lee, 2013; Park 2015; Mainieri, 1997) a total of 9 items were measured on a 5-point Likert scale by adding one question related to eco-friendliness.

This study limited the target items to shoes and bags with a large market size among fashion accessories. Shoes were targeted for all types of shoes, such as sneakers, dress shoes, and sandals. The bag was intended for all bags used in everyday life such as handbags, backpacks, brief bags, and trunks. A wide range of samples were needed to understand the difference in product evaluation standards and interest in environmental issues according to demographic factors, so 227 men and women in their 20s to 50s were extracted for convenience regardless of where they lived.

The questionnaire was conducted for a total of 7 days from June 17 to June 24, 2020. In this study, out of the total 237 responses collected after the experiment, 227 copies were used for the analysis of the results, excluding 10 responses outside the period. This study used a questionnaire method to empirically investigate research problems. The questionnaire is composed of questions on the degree of interest in environmental issues, questions on purchase intentions for each material used in fashion accessories, questions on evaluation criteria for each item of shoes and bags, and questions to investigate demographic characteristics.

Table 1. Presented contents in the survey including the photos and the properties of leather

Textile	Definition	Positive point	Negative point	Property
Chemical leather 	Natural leather obtained from animals and processed with chemicals	Good elasticity and good dyeing for excellent aesthetics	Chemicals used in processing are classified as allergens and carcinogens and cannot be buried or incinerated.	-high price:●●●●○ -durability: ●●●○○ -weight: ●●●●●
Vegetable leather 	Natural leather collected from animals and processed with vegetable materials	Leather damage is reduced, so the pattern is natural and does not emit toxic substances.	The scratches and wrinkles that were originally in the leather are clearly visible, and the color changes over time, making it difficult to manage.	-high price:●●●●● -durability: ●●●○○ -weight: ●●●●●
Synthetic leather (PU, PVC) 	A leather-like pattern is engraved by applying heat and pressure by coating polyvinyl chloride on the fabric.	Various printing and dyeing possible, strong resistance to moisture and contamination	It is classified as industrial waste and must be incinerated without rot, and hazardous substances are detected in the process.	-high price:●○○○○ -durability: ●●●●● -weight: ●●○○○
Recycled leather 	After collecting scraps from the natural leather process, they are made in the form of leather again.	All leather shapes can be reproduced. It does not cause secondary pollution even if it is disposed of again due to the development of an eco-friendly process.	It can be stiff or cracked depending on the manufacturer.	-high price:●●●○○ -durability: ●●●○○ -weight: ●●●●○
Natural fabric (cotton, wool) 	Fabric made from fibers taken from cotton or wool	Thin, breathable and easy to wash	Weakness to pollution and moisture	-high price:●●●○○ -durability: ●○○○○ -weight: ●●○○○
Synthetic fabric (nylon, polyester) 	Synthetic polymers extracted from petroleum are processed to form fibers or other forms.	It is resistant to friction and has excellent tensile strength, making it suitable as a functional tech material.	During the manufacturing process, it emits more carbon than natural fibers, and when discarded, it causes marine and soil pollution.	-high price: ○○○○○ -durability: ●●●●○ -weight: ○○○○○
Biodegradable fabric (corn, milk, pineapple) 	It is made from the leaves of plants such as corn and pineapple to give the texture of fabric and leather.	It is a sustainable vegan material and does not require extra land, water or fertilizer. It is flexible and has excellent moisture resistance and breathability.	Depending on the manufacturer, an unnatural texture such as paper may be felt.	-high price: ●●●●● -durability: ○○○○○ -weight: ●○○○○

3.2.1. Degree of interest in environmental issues and demographic characteristics

As for the degree of interest in environmental issues, two of the items that measured environmental attitudes in the study of Kim (2006) were selected. Three of the questions on environmental consciousness used in the study of Seok & Kim (2005) were selected, and a total of five items were measured on a Likert 5-point scale. The 227 responders were of 58 males (25.5%) and 169 females (74.5%). Ages were 20 to 29 years old (91persons, 38.4%), 30 to 39 years old (33persons, 13.9%), 40 to 49 years old (40persons, 16.9%), and more than 50 (73persons, 30.8%).

3.2.2. Textile materials used in fashion accessories and the questionnaire preparation

Leather were selected based on the types and properties of leather processing methods through a prior study on sustainable leather materials (Kim & Kim, 2017). A total of 7 materials were used for the study by comparing and reviewing alternative materials suggested by ATKO planning, a recycled leather company, and selecting 3 additional materials. The material names and properties used are shown in Table 1. The subjects for the survey read the proposed material name, photo, and description, and answered the questions on a 5-point Likert scale and to the questions of whether or not they would like to purchase if it is used in fashion accessories (bag or shoes).

3.3. Analysis of data

Statistical analysis was performed using SPSS 25.0 for data analysis. An independent sample *t*-test was conducted to find out whether there was a significant difference in the degree of interest in environmental issues according to gender. ANOVA and post-test were conducted to find out whether there was a significant difference in the degree of interest in environmental issues according to age. 2-way ANOVA was used to investigate the cross effect of age and gender. Correlation analysis was conducted to find out the relationship between interest in environmental issues and purchase intentions by textile materials. Correlation analysis was conducted to find out the effect of environmental concerns on the product evaluation criteria of shoes and bags. ANOVA and Duncan were conducted to find out what differences in consumers' purchasing intentions were made according to leather and alternative materials used in fashion accessories.

4. RESULTS

4.1. Environmental attitudes according to demographic variables

4.1.1. Consumer attitude in environmental Issues

For consumers' interest in environmental issues, 2 factors are the problem awareness and the environmental behavior. For the environmental attitude questionnaire, the average was calculated, and analysis of variance and *t*-test were used.

Table 2 shows the calculated means of consumers'

Table 2. Means of the questions on consumers' environmental awareness and behavior

Factors	Questions	Mean	SD	Group mean
Eco-conscious	Humans are seriously damaging nature.	4.41	.790	4.54±.656
	Humans are seriously damaging nature.	4.67	.706	
Green-behavior	After reading a newspaper or TV program on environmental issues, I inform the surroundings.	3.48	.984	3.77±.737
	When I buy something, I try to reduce the number of plastic bags or shopping bags as much as possible.	3.95	.918	
	Even though the price is a little expensive, I have to use products that pollute the environment less.	3.89	.881	

environmental awareness and behavior. Environmental awareness was relatively high with the range of 4.41-4.67, but environmental behavior had a relatively low of 3.48-3.95. The group average of environmental awareness was 4.54, and the group average of environmental attitude was 3.77 (Table 2).

4.1.2. Degree of interest in environmental issues by gender and age

In order to determine whether there is a significant difference in the degree of interest in environmental issues according to demographic variables, the data were analyzed through 2-way ANOVA of gender and age (Table 3).

Both attitude of consumers' environmental issue had significant differences according to gender. Eco-conscious was higher in female (4.60) than male (4.34) (t= -2.623**) and green behavior was higher in female (3.87) than male (3.48) (t= -3.650 ***). In other words, it was found that women showed higher levels of eco-friendly awareness and behavior than men, and this is consistent with the hypothesis1-1 of this study. It can be interpreted that this is because women tend to give more empathy and attention to others and society.

In Table 4, the ANOVA result and Duncan test are shown. The eco-friendly behavior factor was higher in consumers in their 50s than in consumers in their 20s, and this is the content that rejects the hypotheses 1-2 in this study. This result can be interpreted as being led to action with a deeper interest in the sustainable future and environmental issues of the children's generation, since Korea's 50s have more economic power than their 20s.

Eco-attitude of consumers are different according to the gender and age (Table 3 & Table 4), but their cross effects were now appeared statistically. There was no interaction between gender and age. The difference slope between men and women in their twenties in green behavior tended to be slightly steeper than those of other ages, but this difference was not statistically significant.

Table 3. Results of 2 way ANOVA by gender and age

Source	Dependent var.	Type III SS	*d.f.*	MS	*F*	*prob.*
Model	Eco-conscious	4681.376[a]	8	585.172	1429.899	***
	Green-behavior	3252.766[b]	8	406.596	864.411	***
Gender	Eco-conscious	2.073	1	2.073	5.065	*
	Green-behavior	3.993	1	3.993	8.489	**
Age	Eco-conscious	3.977	3	1.326	3.239	*
	Green-behavior	12.450	3	4.150	8.823	***
Gender × Age	Eco-conscious	.219	3	.073	.178	*N.S.*
	Green-behavior	1.848	3	.616	1.309	*N.S.*
Error	Eco-conscious	89.624	219	.409		
	Green-behavior	103.012	219	.470		
Total	Eco-conscious	4771.000	227			
	Green-behavior	3355.778	227			

* p< .05, ** p<.01, *** p<.001, *N.S.* not significant

Table 4. Post Hoc result of interest in environmental issues according to Age groups

Factors	20s (n=89)	30s (n=33)	40s (n=35)	50s (n=70)	*F*	*prob.*
Eco-conscious	4.39 B	4.47 AB	4.62 AB	4.71 A	2.282	*N.S.*
Green-behavior	3.51 B	3.78 AB	3.96 A	4.00 A	5.942	*N.S.*

N.S. not significant, same alphabet represents same group

4.1.3. Purchase intention of fashion accessories

In Table 5, the average value of naturals (cotton, wool) was the highest (4.18), and recycled leather had the second highest (3.77). The third was vegetable leather (3.63). The lowest purchase intention was chemical leather (2.84), and synthetic leather (PU, PVC) was the second lowest (3.02). The third lowest was synthetic fabrics (nylon, polyester) (3.32).

A *t*-test analysis was performed to investigate the purchase intention of fashion accessories according to demographic characteristics. It was found that there was little difference in the purchase intention according to the type of fashion accessory textile by gender. There was only one difference by gender in chemical leather. Males had a significantly higher purchase intention at 3.09 than females 2.75 (t= 2.29*).

In other textiles, there was no difference between men and women. For naturals (cotton, wool) and Biodegradables, women tended to have a somewhat higher purchase intention, and for other materials, men showed a somewhat higher tendency.

Multivariate ANOVA was conducted to see if there was a difference in the degree of purchase intention according to the textiles according to age (Table 6). As a result, there was a significant difference only in vegetable leather and biodegradable, but there was almost no difference in the other materials according to age.

The results of DUNCAN post-hoc were as follows.

Table 5. *t*-test results of purchasing intention by gender according to the material

	Mean	Gender	N	Sub-mean	SD	*prob.*
Chemical leather	2.84	male	58	3.09	.923	t= 2.29*
		female	169	2.75	1.068	
Vegetable leather	3.63	male	58	3.71	1.009	*N.S.*
		female	169	3.60	1.076	
Synthetic leather (PU, PVC)	3.02	male	58	3.19	.926	*N.S*
		female	169	2.96	1.120	
Recycled leather	3.77	male	58	3.71	.838	*N.S*
		female	169	3.79	.981	
Natural fabric (cotton, wool)	4.18	male	58	4.02	.868	*N.S*
		female	169	4.23	.893	
Synthetic fabric (nylon, polyester)	3.32	male	58	3.33	1.082	*N.S*
		female	169	3.32	1.093	
Biodegradable fabric (corn, Milk, Pineapple)	3.56	male	58	3.47	1.030	*N.S*
		female	169	3.59	1.142	

* p< .05, *N.S.* not significant

Table 6. Multivariate ANOVA of purchasing intention by gender according to the material

Independent variable	Dependent variable	Sum of squares	*d.f.*	Mean square	*F*	*prob.*
Age	Chemical leather	3.064[a]	3	1.021	.942	*N.S.*
	Vegetable leather	14.501[b]	3	4.834	4.521	**
	Synthetic leather (PU, PVC)	7.211[c]	3	2.404	2.104	*N.S.*
	Recycled leather	3.822[d]	3	1.274	1.433	*N.S.*
	Natural fabric (cotton, wool)	5.786[e]	3	1.929	2.484	*N.S.*
	Synthetic fabric (nylon, polyester)	8.160[f]	3	2.720	2.339	*N.S.*
	Biodegradable fabric (corn, Milk, Pineapple)	22.938[g]	3	7.646	6.631	***

** p<.01, *** p<.001, *N.S.* not significant

For vegetable leather (Table 7), those in their 30s and 40s had the highest purchase intention and those in their 20s had the lowest ($p<.05$). For biodegradable fabrics, the purchase intention was high among those in their 40s and 50s, and the lowest in their 20s and 30s ($p<.05$).

4.2. Relationship between interest in environmental issues and evaluation criteria for fashion accessories

4.2.1. Important attributes of product when purchasing shoes

The correlation analysis of Pearson Correlation Coefficient was conducted to reveal the relationship between environmental concerns and evaluation criteria of shoes (Table 8). Consumer's interest of eco-friendly correlated with eco-friendliness of shoes, and people who do a lot of eco-friendly behavior consider eco-friendliness of shoe product more when purchasing shoes than people with high eco-consciousness.

Consumers' interest in eco-friendliness showed a high positive correlation with characteristics such as eco- friendliness, comfort, material and service of footwear products, but not with characteristics such as fashion trend, brand and price of footwear products. In other words, consumers with high interest in eco-friendliness placed importance on eco-friendliness, comfort and serviceability of shoes. In addition, when examining in detail, the product evaluation criteria, which are important depending on the interest of eco-friendliness of consumers, were different.

Green behavior showed a high positive correlation with the material and durability characteristics of shoes, while Eco-consciousness showed a high correlation with the design characteristics of shoes. In other words, consumers who do not remain conscious and practice eco-friendly behaviors placed importance on the material and durability of shoes rather than shoe design, and consumers staying in eco-friendly consciousness placed importance on the design characteristics of shoes.

4.2.2. Important attributes of product when purchasing bags

Like the shoes case, there are higher correlations between environmental concerns of consumers and eco-friendliness of bag product compared to other evaluation criteria of bags (Table 9).

Consumers' interest in eco-friendliness showed a high positive correlation with the eco-friendliness importance

Table 7. Duncan's post-test of purchasing intention by gender (Vegetable leather & Biodegradable fabric)

Vegetable leather			
Duncan[a,b,c]			
age	N	subset	
		1	2
20s	89	3.34 B	
50s	70	3.71 B	3.71 A
30s	33		3.85 A
40s	35		4.00 A

Biodegradable fabric (corn, milk, pineapple)			
Duncan[a,b,c]			
age	N	subset	
		1	2
30s	33	3.24 B	
20s	89	3.28 B	
50s	70		3.80 A
40s	35		4.06 A

same alphabet represents same group

Table 8. Correlation between important criteria for shoes buying and interest in environmental issues

Factors	Importance when buying shoes product								
	Design	Materials	Trend	Durability	Comfort	Eco	Brand	Price	Services
Eco-conscious	.190**	.138*	N.S.	N.S.	.244**	.325**	N.S.	N.S.	.232**
Green-behavior	.162*	.235**	N.S.	.298**	.352**	.585**	N.S.	N.S.	.239**

*$p<.05$ **$p<.01$ *N.S.* not significant

of bag products and importance such as service, but not with criteria such as material, trend, brand and price of bag products. In other words, consumers with high interest in eco-friendliness placed importance on eco-friendliness and serviceability of bags.

In detail, the product criteria of bag, which are important depending on the interest of eco-friendliness of consumers, were different.

Green behavior showed a high positive correlation with the durability and comfort characteristics of the bag, while eco-friendly consciousness showed a high correlation with the design characteristics of the bag. In other words, consumers who do not stay in level of consciousness and practice eco-friendly behaviors placed importance on the durability of bags rather than the design of bags, and consumers staying in eco-consciousness placed importance on the design criteria of bags.

Therefore, we can say the hypothesis 2 is found true, for purchasing criteria of durability is important to the consumers of high eco behavior, only.

4.3. Purchase Intention according to the materials of fashion accessories

4.3.1. Relationship between interest in environmental issues of consumers and preferred materials

The Pearson Correlation Coefficient was conducted to reveal the relationship between environmental concerns and the preferred materials in fashion accessories (Table 10). As a result, Eco-consciousness factors were found to have a positive correlation with vegetable leather and recycled leather, and green behavior factors have a positive correlation with vegetable leather, recycled leather, natural fabric, and biodegradable fabric and a negative correlation with synthetic fabric. In other words, consumers who engage in green attitude most prefer products made of Biodegradables and vegetable leather when purchasing shoes and bags. All significant results are shown without any difference between green behavior and eco-consciousness, except a negative correlation in synthetic fabric material. There was no correlation in the eco-consciousness, but in the green behavior, there was a negative correlation with the synthetic fiber material. These results generally mean that the higher the degree of interest in environmental issues, the more eco-friendly leather is preferred. This is consistent with the research results of Mainieri, et al.(1997) and Minton & Rose (1997) that the higher interest in the environment is, the higher the purchase intention for eco-friendly products.

4.3.2. Purchase intention according to leather and alternative materials

When consumers purchase fashion accessories, the difference between groups was examined through

Table 9. Correlation coefficients between purchasing evaluation for bag product and interest in environmental issues

Factors	Importance when buying bag product								
	Design	Materials	Trend	Durability.	Comfort	Eco	Brand	Price	Services
Eco-conscious	.188**	N.S.	N.S.	N.S.	N.S.	.283**	N.S.	N.S.	.255**
Green-behavior	N.S.	N.S.	N.S.	.273**	.172**	.509**	N.S.	N.S.	.226**

*p<.05 **p<.01 N.S. not significant

Table 10. Correlation coefficients between the interest of eco-friendliness of consumers and preference of materials

	Chemical leather	Vegetable leather	Synthetic leather	Recycled leather	Natural fabric	Synthetic fabric	Biodegradable fabric
Eco-conscious	N.S.	.233**	N.S.	.203**	.136*	N.S.	.183**
Green-behavior	N.S.	.202**	N.S.	.188**	.191**	-.155*	.337**

*p<.05 **p<.01 N.S. not significant

ANOVA in order to find out whether there is a difference in purchase intention according to the leather and substitute materials used in the product, and Duncan-test was conducted as a post-test. As a result of ANOVA according to the types of main materials for bags and shoes (Table 11), it was found that consumers' purchase intentions were different according to the types of materials, and there was a statistically significant difference (F = 44.290 ****). Thus hypothesis 3 found to be true.

Table 12 is the average value of the purchase intention of each material and the Duncan test result. As a result of examining the difference in purchase intention according to the type of leather and substitute material, it was found that there was a significant difference. Fashion accessories consumers in Korea are most willing to purchase fashion accessories made of natural fabrics (cotton, wool), followed by recycled leather, vegetable leather, Biodegradable fabric, synthetic material fabric, synthetic leather, and chemical leather.

Natural fabrics were not classified as eco-friendly materials in this study because their impact on the environment differs depending on the process of production, such as organic methods. However, it seems that it is highly appreciated by consumers for its low toxic emission when discarded and its ease of washing and management. Excluding naturals, it can be seen that the purchase intention of eco-friendly leather was higher than that of non-eco-friendly leather.

This result means that consumers are increasingly aware of the seriousness of environmental problems and are trying to purchase fashion accessories made of eco-friendly leather. It can be seen as statistical data supporting prior literature studies that show that interest in sustainable fashion is increasing. Therefore, it seems that the preference for eco-friendly or eco-material clothing revealed in Park (2011) and many other studies also appears in fashion accessories such as shoes and bags and leather products.

In order to analyze the correlation between consumers' purchasing standards and the degree of purchase intention of each leather substitute, the results of spearman correlation analysis (n = 227) are shown in Table 13. Consumers who value design preferred two leathers and natural fabrics. Consumers who value trends and brands are also more likely to purchase leather than other materials, and they show similar characteristics to each other.

Consumers who value the quality of the material have

Table 11. ANOVA result according to the types of main materials of fashion accessories

Dependant varible: Purchase Intention					
Source	Type III SS	*d.f.*	MS	*F*	*Prob.*
Model	283.619[a]	6	47.270	44.290	.000
Type of materials	283.619	6	47.270	44.290	.000
Error	1688.441	1582	1.067		
Total	21134.000	1589			

a. R^2 = .144 (corrected R^2 = .141)

Table 12. Purchase intention according to leather and alternative materials used in fashion accessories

	Chemical leather	Vegetable leather	Synthetic leather (PU, PVC)	Recycled leather	Natural fabric (cotton, wool)	Synthetic fabric	Biodegradable fabric	*F*
Purchase intention	2.84 E	3.63 BC	3.02 E	3.77 B	4.18 A	3.32 D	3.56 C	44.29***

***p<.001 same letter means same grouping

Table 13. Correlation between consumer's purchasing criteria for shoes and types of textiles

Purchasing criteria (Shoes)	Chemical leather	Vegetable leather	Synthetic leather (PU, PVC)	Recycled leather	Natural fabric (cotton, wool)	Synthetic fabric (nylon, polyester)	Biodegradable fabric (corn, milk, pineapple)
Design	.169*	.166*			.197**		
Materials		.214**					
Trend	.166*	.151*					
Durability					.193**		.140*
Comfort					.156*		.216**
Eco	-.132*	.203**	-.228**	.157*		-.354**	.395**
Brand		.144*					
Price						.133*	
Services		.185**	-.153*			-.146*	

* p< .05, ** p<.01, *** p<.001

Table 14. Correlation between consumer's purchasing criteria for bag and types of textiles

Textiles / Purchasing criteria (Bag)	Chemical leather	Vegetable leather	Synthetic leather (PU, PVC)	Recycled leather	Natural Fabric (cotton, wool)	Synthetic fabric (nylon, polyester)	Biodegradable fabric (corn, milk, pineapple)
Design							
Materials		.140*					
Trend	.230**						
Durability							
Comfort					.138*		
Eco		.197**	-.205**			-.284**	.318**
Brand	.189**	.169*					
Price							
Service		.217**	-.179**			-.143*	.242**

* p< .05, ** p<.01, *** p<.001

a high purchase intention to purchase vegetable leather. Consumers who set eco-friendliness as their purchasing criteria had a negative correlation with their purchase intentions for synthetic leather, chemical leather, and synthetic material fabrics, and a positive correlation for biodegradable fabrics, recycled leather, and vegetable leather were positively correlated. By the way, consumers who valued the price were more likely to purchase synthetic materials. Consumers who value after-sales service preferred vegetable leather and were negative about synthetic leather or synthetic fabrics. (The red mark indicates that it appears repeatedly in the case of bag). It can be seen that consumers with high purchase intention of chemical leather place importance on design and trend and do not value eco-friendliness. The purchase intention of vegetable leather has a high positive correlation with most of the purchase criteria, so it has high potential for future development. This also applies to natural fabrics and biodegradable fabrics.

5. CONCLUSION

The purpose of this study was to investigate the effect of the eco-friendliness of leather on the purchase intentions of fashion accessories consumers in Korea. First, there were significant differences in environmentally friendly attitude factors according to gender and age. There were significant differences in eco-consciousness and eco-friendly behavior according to demographic factors. Women showed higher scores for eco-friendly attitude than men, and the eco-friendly attitude was higher among those in their 50s than in their 20s.

There was a significant difference only in vegetable leather and Biodegradable according to age, for vegetable leather, those in their 30s and 40s had the highest purchase intention and those in their 20s had the lowest (p<.05). For biodegradable fabrics, the purchase intention was high among those in their 40s and 50s, and the lowest in their 20s and 30s (p<.05).

Second, consumers' interest in environmental issues has the high correlation with "eco-friendliness and service" among the evaluation criteria for fashion accessories. Consumers of high eco- consciousness are placing importance on design among the characteristics of bags and shoes. The higher the eco-friendly behavior of consumers, the more important material and durability and comfort were when purchasing shoes and bag.

Those who practice eco-friendly activities by item considered the importance of eco-friendliness> comfort> sturdy> materials> service in the order of shoes. In bags, eco-friendliness >durability >service> comfort were considered important in the order. There was little difference in evaluation criteria between shoes and bags, but there was a tendency to evaluate materials and comfort a little more importantly in shoes than in bags.

Third, there was a significant difference in consumers' purchase intentions according to the materials used in fashion accessories. Specifically, the order of purchase intentions of fashion accessories consumers is as follows. Natural fabric (cotton, wool) > recycled leather > vegetable leather > biodegradable fabric (corn, pineapple) > synthetic fabric (nylon, polyester) > synthetic leather (PU, PVC) > chemical leather.

It was found that consumers of fashion accessories prefer bio-degradable fabric and vegetable leather over non-eco-friendly leather when purchasing shoes and bags. According to the degree of interest in environmental issues, the preferred materials of fashion accessories appeared differently. The higher the degree of interest in environmental issues, the higher the probability of purchasing vegetable leather, biodegradable fabric and recycled leather. Consumers who value design, trends and brands of fashion accessary are more likely to purchase leather than other materials. Based on the results of this study, this study attempts to present marketing implications in the fashion miscellaneous field according to demographic variables and environmental issues. Women rather than men and older people than younger ages do more eco-friendly behavior, and accordingly, they are more willing to purchase fashion accessories made of eco-friendly leather. Consumers who are interested in environmental issues consider "eco-friendliness" most important when purchasing fashion accessories, so when operating eco-friendly brands, eco-friendliness should be the most important among product attributes. In the case of shoes, it is necessary to pay more attention to the comfort of the shoe, and in the case of a bag, the durability is more important. In addition, 'service' is also a part that is commonly regarded by eco-friendly consumers in shoes and bags, so it is desirable to provide appropriate follow-up management such as salesperson training and A/S.

This suggests that not only clothing but also fashion accessory companies need to consider planning products using eco-friendly materials. This study has only dealt with the types of leather and alternative materials that are cur-

rently on the market. However, as studies on eco-friendly materials and alternative leathers are continuously being conducted, follow-up studies considering new materials to be developed in the future will be needed.

Acknowledgement

This work was supported by Inha university fund 2021.

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원고접수: 2021.07.06
수정접수: 2021.09.29
게재확정: 2021.11.01.