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Contact Information of the Editorial Office
Editor, Yoh, Eunah
The Costume Culture Association
Dept. of Clothing & Textiles, Hanyang University, 222 Wangsimni-ro, Seongdong-gu, Seoul 04763, Korea
Tel.: +82-10-6668-9959
Fax: +82-2-2297-1190
E-mail: tfie2015@gmail.com

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(Tel.+82-10-6668-9959, Fax.+82-2-2297-1190, E-mail: tfie2015@gmail.com)

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Product Analysis and Development of Amblyopia Eye Patch for Children

Hosun Lim† and Juyoung Sung
Dept. of Clothing & Textiles, Sookmyung Women’s University, Korea

Abstract

In the present study, the materials, sizes, and designs of blind eye patch products of skin-adhesive type and glass-attachment type currently available in the market will be analyzed and ergonomically appropriate blind eye patches will be developed. Although these skin-adhesive type eye patches were easy to use, they had shortcomings such as skin troubles due to the adhesive used on the weak and sensitive skin of children and the fact that eyebrows are pulled out and the skin is irritated when the eye patches are detached after being attached. The non-adhesive type eye patches were blind patches to be worn by putting into glasses. These products were made using diverse materials such as neoprene, non-woven fabrics, and felt and showed differences in tactile impressions and irritation to the skin depending on material characteristics. In addition, most products were efficient in blocking light with three-dimensional oval designs comprising darts. In the present study, blind eye patches were designed to reduce skin troubles by using sweat-absorbing and quick-drying functional materials with soft tactile impressions. In addition, to increase the effect to block light and the degree of tight contact with the skin when the blind eye patches are worn compared to existing eye patch designs, the sides of the wings of the blind eye patches were widened, glass frame fixing plates were added, and the darts were made to be curved thereby making an ergonomic design reflecting the shape of the face. The non-adhesive type blind eye patches developed in the present study are considered to enhance the wearing sensation with the use of the material without skin irritation but with cushioning feelings and the ergonomic design reflecting the contour of the face.

Keywords: children, amblyopia, eyepatch, product development, product size

I. Introduction

Amblyopia is a disease with which visual acuity declines that appears on one eye or
both eyes at times when the vision is immature and shows incidence rates in a range of 0.5%~3.5% among preschool children and school age children (Oh & Lim, 2003; Yeom, Han, & Lee, 2004). Among amblyopia treatment methods, patching treatment that covers the normal eye with an eye patch is the most universally implemented and is known to be effective (Ahn, Lee, Park, & Choi, 2009; Yeom et al., 2004). Since amblyopia as such requires continuous and appropriate patching treatment, studies of blind eye patches are acutely required. Blind eye patches for amblyopia treatment currently available on the market are made as adhesive types and non-adhesive types. In the case of adhesive type eye patches for patching treatment, a tendency to avoid wearing may appear due to the problem of skin diseases in areas in contact with the eye patches that may occur when the eye patches are worn for a long period of time (Kim & Choi, 2008; Kim & Choi, 2015). As a countermeasure against the problem, non-adhesive type eye patches for patching treatment are worn. Therefore, the present study is intended to analyze adhesive type and non-adhesive type eye patch products currently available on the market and develop designs of such products.

II. Product Analysis

The materials, sizes, and designs of blind eye patch products of skin-adhesive type and glass-attachment type currently available in the market were analyzed. The blind eye patch products from 3M Co. and Tomato Glasses were analyzed as adhesive types. The blind eye patch products from Richmond Co. in the USA, products from China, and products from Kawamoto in Japan were analyzed as glass-attachment type blind patches which are non-adhesive types (Table 1).

Table 1. Amblyopia eye patch products in the market

<table>
<thead>
<tr>
<th>No</th>
<th>Company/ Product name</th>
<th>Type</th>
<th>Product design</th>
<th>Material</th>
<th>Product size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3M/ Eye Patch</td>
<td>Skin-adhesive type</td>
<td>Non-woven, adhesive</td>
<td>63mm*47mm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>KOREA TOMATO GLASSES CO./ Eye Patch</td>
<td>Skin-adhesive type</td>
<td>Non-woven, adhesive</td>
<td>88mm*70mm (Kids)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>USA RICHMOND CO./ Nonadhesive Eye Patch</td>
<td>Glass-attachment type</td>
<td>Polyester</td>
<td>102mm*80mm</td>
<td></td>
</tr>
</tbody>
</table>
1. 3M Eye Patch

The 3M eye patch is adhesive type blind patches in the form of paper plasters that can be attached to and detached from the skin. As shown in Figure 1, these blind patches are designed to be in an oval shape and to be attached so that the narrower end faces the nose. To review the structure, each blind patch has a pad for blocking light to protect the eye that has water absorption power but has no adhesive force in its lower part. A breathable adhesive paper plaster is above the pad. The full size of this blind patch is 50mm length * 65mm width and the size of the pad in its lower part is 25mm length * 38mm width. Although this 3M eye patch is an adhesive type patch that can be easily used, it has shortcomings such as skin troubles due to the adhesive used on the weak and sensitive skin of children and the fact that eyebrows are pulled out and the skin is irritated when the eye patches are detached after being attached.

Figure 1. 3M eye patch
http://www.gmarket.co.kr
2. TOMATO GLASSES CO. Eye Patch

The Tomato blind patch is in the form of sticking plasters made of non-woven fabrics, which are intended to be directly attached to and detached from the skin around the eyes. As shown in Figure 2, these blind patches are designed to be in an oval shape and to be attached so that the narrower end faces the nose. To review the structure, each blind patch has a pad for blocking light to protect the eye that has water absorption power but has no adhesive force in its lower part and a breathable non-woven fabric plaster with a cutting line for tight contact with the curved region of the face and with adhesive force above the pad. The full size of the kids product is 70mm length * 88mm width and the size of the pad in its lower part is 50mm length * 68mm width. These Tomato blind patches are relatively larger in size compared to 3M eye patches and are produced in diverse models according to target consumers. Tomato blind patches are also easy to use; however, they had shortcomings such as skin troubles due to the adhesive used on the weak and sensitive skin of children and the fact that eyebrows are pulled out and the skin is irritated when the eye patches are detached after being attached.

![Figure 2. TOMATO GLASSES CO. eye patch](http://www.gmarket.co.kr)

3. RICHMOND CO. Nonadhesive Eye Patch

The non-adhesive type eye patch is blind patch to be worn by putting into glasses. As shown in Figure 3, these blind patches are designed to be in an oval shape and are composed on three-dimensional shaped eye patches that cover the eyes and pieces to fix the blind patches to the lens part of eyeglasses. The material is a fabric which is also generally called neoprene made by inserting polyester sponge between two layers of a polyester material and laminating the materials to say accurately. To review the structure, a pad for blocking light to protect the eye is in the area that would come into contact with the skin around the eye and a piece for attachment to eyeglasses is sewn above the pad. The pattern size when the three-dimensional pad is spread to become a plane is 90mm length * 113mm width and the pad comprises three darts for its three-dimensional shape. The size of the piece for fixing to eyeglasses is 55mm length * 50mm. These non-adhesive type blind patches are less irritant to the skin compared to adhesive types that are attached to the skin because they are worn by fixing to eyeglasses. These blind patches seem to be products made to reduce skin irritation and improve wearing sensation by minimizing the area that comes into contact with the skin through three-dimensional designs utilizing light-blocking cushioning materials. However, the material that
comes into the skin does not have a soft surface touch; therefore, if these blind eye patches are worn for a long period of time, skin troubles may appear.

Figure 3. RICHMOND CO. nonadhesive eye patch
http://storefarm.naver.com/e-glasses/products/211001408

4. Children Amblyopia Nonadhesive Eye Patch

These non-adhesive type blind patches are made of non-woven fabric materials and are designed to be working by putting them on eyeglasses. As shown in Figure 4, their design consists of oval shaped eye patches and wing pieces for attachment to the glass frame. To review the structure of the blind patches, each of the blind patches has a flat oval shaped pad for blocking light to protect the eye and has side wings that play the role of blocking light from the sides and fixing the patch to the glass frame. These blind patches are manufactured in two sizes of small and big. The small size of these flat shaped blind patches is 50mm length * 82mm width and the big size is 50mm length * 100mm width. These patches are less irritant to the skin compared to adhesive type blind patches. Compared to the three-dimensional shaped products from Richmond Co. and Kawamoto Co., these blind patches may provide lower patching treatment effects because these blind patches are flat shaped and do not effectively block light due to the space between the eyeglasses and the eyes formed when they are attached to eyeglasses and the eyeglasses are worn.
5. KAWAMOTO CO. Nonadhesive Eye Patch

The non-adhesive type eye patch from Kawamoto Co. is blind patch to be worn by putting into glasses. These blind patches are designed to have oval three-dimensional shaped eye patches for covering the eyes, pieces for fixing the eye patches to glass lens, and pieces for the eye patches to the glass frame. They are made of felt materials with no cushioning and with a stiff feeling. As shown in Figure 5, each of these blind patches consists of a pad for blocking light to protect the eye which is in the area that would come into contact with the skin around the eye and a piece for attachment to eyeglasses added to the top of the pad. This piece is designed to have Velcro on one side for adjustment according to the size of the glass lens for attachment of the eye patch to the eyeglasses. In addition, a piece for fixing the blind eye patch to the glass frame was attached so that the blind eye patch can be stably fixed. The pattern size when the three-dimensional pad is spread to become a plane is 103mm length * 108mm width and the pad comprises two darts for its three-dimensional shape. The size of the piece for fixing the blind eye patch to the glass lens is 65mm length * 82mm width and the size of the piece for fixing the blind eye patch to the glass frame is 8mm length *
15mm width. These patches are less irritant to the skin compared to adhesive type blind patches. Compared to the three-dimensional shaped products from Richmond Co. made using cushioning materials, these blind patches made of felt materials do not have the cushioning of thick materials thereby having less effects for tight contact with the skin and may irritate the skin with the stiff feeling of felt.

![Pattern size and Wearing image](image)

**Figure 5.** KAWAMOTO CO. nonadhesive eye patch
http://www.gmarket.co.kr

### III. Product Development

The present study was intended to analyze blind eye patch products of skin-adhesive type and glass-attachment type for amblyopia treatment currently available in the market and develop blind eye patch products based on the results. Since non-adhesive type blind patches are relatively less irritant to the skin compared to adhesive type patches that are to be attached to and detached from the skin based on the results of product analyses, the blind eye patches of non-adhesive type were developed in the present study. In the present study, opinions on design plan, problems and matters that require improvement in the non-adhesive type blind eye patches currently available on the market were collected through interviews with an expert who currently has a career at least 7 years in the eyeglass industry in the form of questions and answers and the opinions were reflected when developing the product. According to the opinion of the expert, the blind eye patches have a weak material in the area that comes into contact with the skin and this material sometimes causes troubles to the weak and sensitive skin of children, a material suitable for the skin should be applied. The design in this study was developed based on the design of Richmond Co. having excellent tight fit according to the opinion of the expert. In addition, the size of the area for the side of the face should be adjusted to improve the tight contact of the blind eye patches with the skin.

Accordingly, in the present study, a fabric that is also generally called neoprene made by inserting sponge between two layers of the fabric and laminating the materials, which has cushioning feelings and gives soft feeling when it
comes into contact with the skin was used as a material of non-adhesive type blind eye patches. Since no appropriate fabric considering skin troubles could be obtained from among fabrics available on the market, a suitable functional fabric was custom-made. That is, the Cella Peach(Polyester 84%, Spandex 16%) fabric that has sweat-absorbing and quick-drying properties and with soft tactile impressions as with natural materials was used for the inside of the blind eye patches that would come into contact with the skin to reduce skin troubles. Coolmani(Nylon 18%, Polyester 76%, Spandex 6%) fabric which is a functional material with good breathability was used as a material of the outside surface. A fabric was custom-made by laminating the two fabrics with a sponge(0.5cm thick) inserted between the two fabrics. In addition, the side wings of the blind eye patches were widened by 2cm to enhance the degree of tight contact in the face region above that of existing eye patch designs in three-dimensional shapes and pieces to fix the blind eye patches to eyeglasses were attached to the eye patches so that the eye patches can come into tight contact with the face on the sides of the face.

As shown in Figure 6, to increase the degree of tight contact in the area for the side of the face, the blind eye patch was widened by 2cm from the side wing, the straight darts in the wing area was changed into curved darts to make the area convex to fit the curve of the contour of the face, and the end point of the darts was lengthened by 1cm. In addition, to reduce the pressure from the nose pads of eyeglasses, the width of the area in front of the face that would come into contact with the nose was modified so that the area entered 0.5cm to the inside. The piece for fixing the blind eye patch to the glass frame was designed to be 3.5cm length so that the blind eye patch can be put into this piece regardless of whether the blind eye patch is used on the left glass lens or the right glass lens and to have a stitch line on the center so that the glass frame would not move up and down when the blind eye patch is worn.

Figure 6. Design of the developed blind eye patch
IV. Conclusion

The present study was intended to analyze adhesive type and non-adhesive type blind eye patch products for amblyopia treatment and develop ergonomic blind eye patches efficient for amblyopia treatment based on the results of analysis. These blind eye patches were designed to reduce the skin troubles that may occur when the blind eye patches are used for a long period of time by using a functional material with high breathability and a low level of skin irritation laminated with cushioning sponge. In addition, to increase the effect to block light and the degree of tight contact with the skin when the blind eye patches are worn compared to existing eye patch designs, the sides of the wings of the blind eye patches were widened, glass frame fixing plates were added, and the darts were made to be curved thereby making an ergonomic design reflecting the shape of the face. The non-adhesive type blind eye patches developed in the present study are considered to enhance the wearing sensation with the use of the material without skin irritation but with cushioning feelings and the ergonomic design reflecting the contour of the face. The results of development in the present study are expected to be basic data for design of nonadhesive type blind eye patches. Follow-up studies should be conducted to evaluate the nonadhesive type blind eye patches by having them worn by consumers.

References


Matching Sourcing Destination with Fashion Brands’ Business Model: Comparative Advantages of Bangladesh and Vietnam Apparel Industries

Bertha Jacobs¹†, Leslie Simpson², Sara Nelson², and Elena Karpova²

¹Dept. of Consumer Science, University of Pretoria, South Africa
²Dept. of Apparel, Events, and Hospitality Management, Iowa State University, USA

Abstract

This study investigated the comparative advantages of the Bangladeshi and Vietnamese apparel industries using Global Value Chain (GVC) framework. In this study, the GVC framework was expanded to include social and environmental sustainability issues. Secondary data, for the 2012 - 2013 period, were collected and analyzed for each component of the apparel GVC. The findings indicated that while both countries have unique comparative advantages, Vietnam clearly emerged as a leader on many GVC components. Bangladesh’s comparative advantage lies in lower wages, producing high volume orders, and lean manufacturing. In spite of Vietnam’s higher labor costs, it has comparative advantages in higher productivity, skilled and trained workers, manufacturing of intricate styles of high quality, agility and flexible manufacturing, more developed infrastructure and logistic services as well as greater social and environmental compliances. This study contributes towards insight into best sourcing fit for fashion brand business models. Based on the findings, fashion driven companies offering more complex styles at a faster rate will benefit from choosing Vietnam. In contrast, Bangladesh might be a better choice for high volume driven companies that offer basic apparel and better value for their consumers. From theoretical perspective, the research makes an important contribution by expanding the GVC framework.

Keywords: sourcing, Bangladesh, global value chain, Vietnam

I. Introduction

In today’s highly competitive retail landscape, fashion companies are striving to better their financial performance. To keep up with the escalating competition, fashion brands are constantly refining their global sourcing practices in an attempt to lower production costs and delivery time (Rollins, Porter, & Little, 2013). One of the solutions is to better match suppliers’ resources and capabilities with the company’s business model: value basic apparel vs. fast delivery of fashionable styles (Ganesana, George, Jap, Palmatier, & Weitz, 2009).

Even though China has been the major apparel producer since the early 2000’s...
fashion brands have been increasingly using new locations for apparel assembly (Berg & Hedrich, 2014). Rising production costs and tightening environmental regulations in China as well as consumer demand for fast fashion at lower prices has become major motivations for firms to re-evaluate their sourcing strategies (Berg, Berlemann, & Hedrich, 2013). Finding new locations to produce fashion products requires a suitable match between customer needs and business operations with the capabilities of the sourcing location. “A poor match will limit the company’s ability to respond to market changes and is likely to inhibit company growth” (Rollins et al., 2013, p. 141).

Bangladesh and Vietnam have been recognized as the fastest growing and most promising apparel producing nations (Beron, 2014; Salmon, 2013). Yet, limited information exists about the respective strengths and weaknesses of Bangladesh and Vietnam’s apparel industries and their apparel industries will integrate with fashion companies’ business models. The purpose of this study was to examine comparative advantages of the Bangladeshi and Vietnamese apparel industries to provide important information for fashion companies. A comprehensive investigation and understanding of the two industries can be helpful in making informed decisions when choosing locations for sourcing fashion production.

First, this paper presents the Global Value Chain (GVC) framework to conceptualize this research. Second, the research methodology employed is discussed. Third, the results of the analysis of Bangladeshi and Vietnamese apparel industry comparative advantages are presented. The paper concludes with implications and recommendations for fashion brands considering sourcing apparel production from these two countries.

II. Literature Review

1. Comparative Advantage

Comparative advantage refers to location-specific advantage and impacts where to source from. “It is based on the lower cost of a factor (labor, for example) in one country relative to another, favoring industries that use this factor intensively” (Kogut, 1985, p. 15). The comparative advantage theory, proposed by Ricardo in 1816, has been applied to evaluate industries such as agriculture and automobiles, in addition to the textile and apparel sectors (Ruffin, 2002). The GVC framework has been utilized to assess comparative advantages of industries in different countries (Lu & Karpova, 2011).

2. Global Value Chain (GVC)

For this study the GVC was employed to analyze the comparative advantages of the apparel industries in Vietnam and Bangladesh. Global value chains refer to global systems that are producer-driven or buyer-driven (Gereffi & Memedovic, 2003). Producer-driven chains are capital and technology intensive industries such as automobiles, and computers. The apparel industry is a buyer-driven value chain, characterized by its labor-intensive nature and presence of large retailers and brands that play a pivotal role in specifying product requirements for a specific market (Gereffi & Frederick, 2010). Global sourcing is a crucial function for buyer-driven value chains (Gereffi & Memedovic, 2003) and is motivated by the need to reduce operational costs and increasing business flexibility to respond quickly to changing markets (Shelton & Wachter, 2005).

In order to choose most effective location for fashion production, companies need to prioritize their “procurement requirements” and then make trade-offs among important factors such as cost of manufacturing, quality, capacity,
speed, and possible risk involved (Berg & Hedrich, 2014, p. 63). The GVC provides apparel firms with a tool to prioritize their procurement requirements and to evaluate the strengths and weaknesses of various manufacturing locations. The GVC covers the following components: material supply; manufacturing capabilities; established transportation networks and export channels; and marketing and retail networks (Gereffi & Memedovic, 2003). Because Bangladesh and Vietnam are primarily export-oriented apparel producers, the last GVC stage was not included in this study. Instead, an expansion of the GVC framework to include social and environmental sustainability components was proposed because many apparel firms place increasing importance on these factors when evaluating potential apparel suppliers.

2.1 Material supply

Access to materials (fiber, yarn, fabric) is essential to producing apparel (Rivoli, 2014). According to Brown and Zukerman (2012), waiting for materials contributes to the longest part of the product cycle and is detrimental in terms of hidden costs. In this study, Bangladesh and Vietnam’s availability and access to a variety of materials were evaluated.

2.2 Manufacturing capabilities and capacity

In apparel industry, labor cost can account for up to two-thirds of the total production cost (Rivoli, 2014). A superior workforce is one that receives lower wages than other comparative countries, maintains steady yet increasing productivity, and has the necessary skills to complete the work. Quality and capacity have to be taken into consideration when assessing a country’s manufacturing capabilities (Lu & Karpova, 2011). Flexibility in offering customers lean or agile manufacturing can result in a national industry’s competitive advantage. Additionally, on the supply side, the performance and options offered such as full-package options versus CMT (cut, make, and trim) and adaptability (flexibility, lead time) will influence sourcing decisions (Gereffi & Memedovic, 2003).

2.3 Transportation networks and logistics services

It is important to consider “hard” dimension related to tangible infrastructure such as roads, ports, highways, and telecommunications, as well as “soft” dimension related to customs management, and other institutional aspects. In addition, electricity supply and communication infrastructure (internet and phone) are critical components in establishing efficient and effective supply chain in the highly fragmented apparel global industry. Final product cost and delivery time depend on these factors (Gereffi & Memedovic, 2003).

2.4 Social and environmental sustainability

More apparel companies are taking a proactive approach to ensure that suppliers comply with regulations on safety, human rights, and environmental protection (Berg et al., 2013). Leading fashion retailers agreed that corporate social responsibility now ranks as the “most important factor when it comes to sourcing before production quality, reliability, and flexibility” (Berg et al., 2013, p. 6). Fashion companies contemplating moving production to countries with lower wages now also consider social and environmental risks. Social sustainability factors comprise “access to basic necessities, vulnerability to economic exclusion [and] social cohesion” (Corrogan, Crotti, Hanouz, & Serin,
and environmental sustainability factors include “environmental policy, use of renewable resources and degradation of the environment” (Corrigan et al., 2014, p.66).

3. Overview of Bangladeshi and Vietnamese Apparel Industries

In Table 1, the indicators related to the apparel industry performance in Bangladesh and Vietnam are summarized and compared with China, the world’s leader in apparel manufacturing. Apparel industry contributes 10% to the two countries’ gross domestic product (GDP), which is twice more than in China. Vietnam’s industry has higher annual growth rate of 21% (14% for Bangladesh). Vietnam also has twice greater growth in the world’s share exports. Vietnam and Bangladesh have a comparable number of factories, 4,500 and 6,000, respectively.

Table 1. Performance of Bangladeshi, Vietnamese and Chinese apparel industries, 2013

<table>
<thead>
<tr>
<th>Indicators</th>
<th>China</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>World ranking in apparel exports</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Apparel export (in USD millions)</td>
<td>96,810</td>
<td>13,115</td>
<td>8,454</td>
</tr>
<tr>
<td>Contribution to the national GDP (%)</td>
<td>5%</td>
<td>10%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Apparel export share in the total exports (%)</td>
<td>4.4%</td>
<td>80%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Apparel exports share in the world’s exports (%)</td>
<td>43.35%</td>
<td>5.87%</td>
<td>3.79%</td>
</tr>
<tr>
<td>Growth of apparel export in value (% p.a.)</td>
<td>16%</td>
<td>14%</td>
<td>21%</td>
</tr>
<tr>
<td>Growth of share in world exports (% p.a.)</td>
<td>7%</td>
<td>5%</td>
<td>12%</td>
</tr>
<tr>
<td>Number of apparel manufacturing companies</td>
<td>&gt;100,000</td>
<td>6,000</td>
<td>4,500</td>
</tr>
<tr>
<td>Population</td>
<td>1.4 bil</td>
<td>158.5 mil</td>
<td>90.6 mil</td>
</tr>
</tbody>
</table>

Sources: International Trade Centre, 2015; Schwab & Sala-i-Martin, 2014; WTO, 2014

3.1 Bangladeshi apparel industry

Bangladesh was traditionally known for its artisans who worked in small groups to produce textiles and apparel. In the early 1980’s, the Bangladeshi government privatized textile industry and apparel industry (Islam, Khan & Islam, 2013). In the 2000s, apparel exports have grown at an average annual rate of 8% (Berg et al, 2013). Its share of world clothing exports has grown from 2.6% in 2000 to 5.1% in 2013 (WTO, 2014).

3.2 Vietnamese apparel industry

North and South Vietnam united in 1975, when the Vietnamese government initiated an economic policy to encourage privatization and growth of local businesses as well as promoting relations with other countries. Vietnam exports apparel to over 180 countries and territories (WTO, 2014). The country has benefited from the ASEAN free trade agreements. If passed, the Trans-Pacific Partnership (TPP) agreement will allow duty free Vietnamese apparel exports to the US, Japan, and Australia.
III. Methodology

To analyze comparative advantages of Bangladesh and Vietnam’s apparel industries based on the GVC framework, secondary data were collected from world’s and governmental organizations for the 2012 - 2013 period. Export and import data were collected from the World Trade Organisation [WTO] (2014) and the United States Department of Agriculture [USDA] (2013). Labor costs, manufacturing capabilities, skills and added services data were collected from the International Labour Organization (2014) and International Trade Centre (2015).

The World Bank’s logistics performance index (LPI) was used to examine logistical services. Indicators from the Global Competitiveness Index (GCI) compiled by the World Economic Forum (Schwab & Sala-i-Martin, 2014) was used to analyse productivity, education, and on the job training of workers as well as compliance with social and environmental regulations. Specific indicators used from the GCI were: productivity and pay ratio, education level of workers, on-the-job training, employment, workers safety, basic human rights and compliance with environmental regulations. Other organization and industry reports were consulted, such as Organization of Economic Co-operation and Development [OECD] (2015) and CBI (2013/2015) to obtain data about working conditions, lead-times, and industrial integrations, etc. The GVC framework was used to structure descriptive analyses of all the data to examine and compare comparative advantages of the Bangladeshi and Vietnamese apparel industries.

IV. Results

1. Raw Materials and Textile Supply

For garment production, materials make up 50-70% of the total cost and determine product quality (Van Tot, 2014). Cost, quality, and availability of materials (fiber, yarns, fabrics, threads, findings, and packaging) are critical for timely and efficient apparel production (Berg et al., 2013; Rivoli, 2014).

1.1 Domestic production of materials

Table 2 presents Bangladesh and Vietnam’s fiber, yarn, and fabric productions. With a total output of 129,000 bales, Bangladesh produces six times more cotton than Vietnam (21,000 bales). Bangladesh’s yarn production also substantially exceeded that of Vietnam. Bangladesh has almost four times as many spinning mills as Vietnam and almost twice as much spindle capacity (Dao & Huong, 2013; Hussain, 2013). At 3.95 billion meters, Bangladesh also exceeds Vietnam in fabric production (Table 2). The two countries have similar capacity for dyeing and finishing fabric.
Table 2. Bangladesh and Vietnam’s fiber, yarn, and fabric production, 2012/2013

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fiber Production</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton (bales)</td>
<td>129,000</td>
<td>21,000</td>
</tr>
<tr>
<td><strong>Yarn production</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinning mills</td>
<td>394</td>
<td>100</td>
</tr>
<tr>
<td>Spindle capacity (kg)</td>
<td>9,600,000</td>
<td>5,100,000</td>
</tr>
<tr>
<td>Rotor/Open-End capacity (kg)</td>
<td>230,000</td>
<td>103,348</td>
</tr>
<tr>
<td>Production of yarn from cotton and polyester/rayon (tons)</td>
<td>688,000</td>
<td>680,000</td>
</tr>
<tr>
<td>(primarily cotton yarn production)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fabric production</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric production</td>
<td>3.95 (billion meters)</td>
<td>1.0 (billion meters)</td>
</tr>
<tr>
<td>Dyeing and finishing</td>
<td>240 mills</td>
<td>240 mills</td>
</tr>
<tr>
<td>Knitted and woven fabrics</td>
<td>780 weaving mills</td>
<td>1,000 knit and woven mills</td>
</tr>
</tbody>
</table>

Handwoven = 650 million meters

Knitted = 80,000 tons

Woven = 700 million meters

Sources: USDA (2013)

Bangladesh’s strength lies in woven fabrics, particularly, in hand-woven textiles (Hussain, 2013). However, the country still faces an escalating demand for textiles and a pressing need to upgrade capacities in spinning, weaving, knitting, dyeing, and integration of up-to-date technology to guarantee quality products at competitive prices (Islam et al., 2013).

Vietnam has been developing its knitting sector significantly (Islam et al., 2013). Yet, in 2013, only 20-25% of the woven fabric demand for apparel was produced domestically (Van Tot, 2014). Vietnamese fiber and yarn diversity and quality are not strong enough to meet the growing apparel industry’s needs.

1.2 Import of fiber, yarn, and fabric

Table 3 presents a summary of textile imports by the two countries. In 2013, the total world’s cotton import was 8.4 million tons (Van Tot, 2014). Of the total, Bangladesh imported 0.7 million tons and Vietnam imported 0.4 million tons of cotton. This is despite the fact that Bangladesh grows significantly more cotton than Vietnam (Tables 2). To support the fast growing apparel production, cotton use in the country has grown aggressively by over 1,000% in the 2010s (Emergingtextiles.com, 2015). Yet, Vietnam imports 70% more yarn and twice more fabric than Bangladesh (Table 3).

Table 3. Bangladesh and Vietnam’s material imports, 2012/2013

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton as input material (million tons)</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Yarn (thousand tons)</td>
<td>280.0</td>
<td>380.3</td>
</tr>
<tr>
<td>Fabric (billion meters)</td>
<td>2.4</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Source: USDA (2013)
2. Apparel Manufacturing Capabilities and Capacity

Bangladesh has more apparel factories (6,000) than Vietnam (4,500) (Table 1). However, the size and productivity must be taken into consideration. Major indicators for apparel manufacturing capabilities in Bangladesh and Vietnam are presented in Table 4.

Table 4. Bangladesh and Vietnam’s apparel manufacturing capabilities

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor costs (per month)</td>
<td>~$50</td>
<td>~$100-$150</td>
</tr>
<tr>
<td>Productivity</td>
<td>Lower productivity (103rd)</td>
<td>Higher productivity (23rd)</td>
</tr>
<tr>
<td>Workforce skills</td>
<td>98 rank (out of 144): Low level of skills and training</td>
<td>64 rank (out of 144) Skilled and trained workers (64th)</td>
</tr>
<tr>
<td>Quality</td>
<td>125th rank (out of 144) Inconsistent &amp; lower quality</td>
<td>96th rank (out of 144) Consistent and higher quality</td>
</tr>
<tr>
<td>Adaptability (flexible, lean, agile)</td>
<td>Strength – Lean manufacturing</td>
<td>Strength – Agile manufacturing</td>
</tr>
<tr>
<td>Type of production</td>
<td>Mostly CMT-based</td>
<td>Mostly CMT-based Early stages of value-added services / full-package production</td>
</tr>
</tbody>
</table>

Sources: International Labour Organization, 2014; Schwab & Sala-i-Martin, 2014

2.1 Workforce skills, productivity, and cost

In 2014, workers’ minimum monthly wages in Bangladesh’s apparel industry was a little over $50. In the same year, Vietnam’s monthly wages ranged from just under $100 to almost $150. The Global Competitiveness Index (GCI) evaluates the relationship between productivity and wages in a country’s overall labor market (Schwab & Sala-i-Martin, 2014). A score of 1 means that wages has no relationship to productivity, and a score of 7 means that wages have a strong association with productivity. Bangladesh is ranked 103rd, with a score of 3.5 indicating that wages are somewhat related to worker productivity. Vietnam is ranked 23rd and has a score of 4.6 indicating a stronger relationship between wages and worker productivity. This indicates that Vietnam’s productivity is superior over Bangladesh. The GCI measures workforce skills with education and job training indicators. Bangladesh is ranked 98th with a score of 4.5 in the primary education category, whereas Vietnam has a higher score of 5.3, and is ranked 64th out of 144 countries (Schwab & Sala-i-Martin, 2014).

2.2 Quality, adaptability, and technology

Although Bangladesh is efficient at managing high-volume orders (Berg & Hedrich, 2014), product quality is lower and inconsistent – ranked 125th out of 144 countries (Table 4). Vietnam’s apparel industry is capable of producing higher quality products: the country ranked 96th. Bangladesh demonstrates strengths in lean production, whereas Vietnam – in agile manufacturing (Berg et al., 2011; Vietnam trade promotion agency [Vietrade], 2012). In
Bangladesh, the average lead time is between 90 and 120 days; very few producers have the ability to push times below 30 days.

Bangladesh’s apparel industry is mostly CMT-based (Berg et al., 2011; Monsur & Yoshi, 2012). Similarly, Vietnam’s garment manufacturing has been primarily CMT-based, but newer firms have been steadily increasing their value-added service by providing full-package options (Van Tot, 2014). To summarize, Vietnam’s apparel industry has a definite comparative advantages in productivity, quality, skilled workforce, and agile production (Table 4). However, in the labor-intensive garment sector, Bangladesh’s low-cost workforce can still compensate for the lower productivity rates and can handle high-volume orders.

3. Infrastructure and Logistics Services

To support apparel manufacturing and trade, Vietnam has a superior transport infrastructure (roads, ports, airports, railroads) in comparison with Bangladesh (ranked 76 vs. 115; Table 5). The former is also almost twice ahead in terms of internet communication and technology use (scores 2.3 vs. 1.2; ranked 86 vs. 131) and electricity and phone infrastructure (scores 4.0 vs. 2.1; ranked 81 vs. 127). The data indicate faster and easier communication with Vietnamese factories, more reliable power supply, and faster deliveries.

Table 5. Bangladesh and Vietnam’s infrastructure and logistics performance, 2014

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Vietnam</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Ranking</td>
<td>Score</td>
</tr>
<tr>
<td>Overall LPI</td>
<td>2.56</td>
<td>108</td>
<td>3.15</td>
</tr>
<tr>
<td>Customs</td>
<td>2.09</td>
<td>138</td>
<td>2.81</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>2.11</td>
<td>138</td>
<td>3.11</td>
</tr>
<tr>
<td>International shipments</td>
<td>2.82</td>
<td>80</td>
<td>3.22</td>
</tr>
<tr>
<td>Logistics competence</td>
<td>2.64</td>
<td>93</td>
<td>3.09</td>
</tr>
<tr>
<td>Tracking and tracing</td>
<td>2.45</td>
<td>122</td>
<td>3.19</td>
</tr>
<tr>
<td>Timeliness</td>
<td>3.18</td>
<td>75</td>
<td>3.49</td>
</tr>
</tbody>
</table>

|                                  | Score      | Ranking | Score    | Ranking |
| Transport infrastructure         | 2.70       | 115     | 3.50     | 76      |
| Internet and communication technology use | 1.20       | 131     | 2.30     | 86      |
| Electricity and phone infrastructure | 2.10       | 127     | 4.00     | 81      |

Sources: Schwab & Sala-i-Martin, 2014; World Bank, 2014

The logistics performance index (LPI) is calculated based on six dimensions: 1) efficiency of clearance process by customs; 2) quality of trade and transport related infrastructure; 3) ease of arranging competitively priced shipments; 4) competence and quality of logistics services; 5) ability to track and trace consignments; and 6) timeliness of shipments in reaching destination within the scheduled or expected delivery time. Considering transportation and logistics services, Vietnam by far surpasses Bangladesh: all rankings are almost better (Table 5). Bangladesh is at a major disadvantage in terms of its infrastructure, logistics, and stable energy supply.

4. Social and Environmental Sustainability

Social indicators analyzed were workers safety and basic human rights. Environmental indicators included: renewable resources and eco-friendly practices. The factors for both countries are reported in Table 6.
Table 6. Bangladesh and Vietnam’s social and environmental sustainability indicators

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human rights</td>
<td>Massive violations</td>
<td>Isolated occurrence of violations</td>
</tr>
<tr>
<td>Safety</td>
<td>Poor safety</td>
<td>Acceptable safety</td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>3.35 (lower compliance)</td>
<td>3.67 (higher compliance)</td>
</tr>
</tbody>
</table>


4.1 Social sustainability

Bangladesh’s apparel industry employs about 4 million workers (Bangladesh Garment Manufacturers and Exporters Association [BGMEA], 2015), and in Vietnam about 2.2 million people are employed in the apparel industry (Vietrade, 2012). Bangladeshi apparel industry has suffered from numerous workplace tragedies that have damaged its global reputation, such as worst in the history fires and building collapses. In addition to poor workers safety, human right violations, low wages, and insufficient worker benefits have resulted into violent protests that forces factories to shut their operation. Vietnam, overall, has better safety regulations and compliance. Workers do have access to trade unions that play a supporting role in negotiations of pay, benefits and workers’ rights (Cox, 2015).

4.2 Environmental sustainability

The GCI measures countries compliance with environmental regulations such as use of renewable resources and environmental policy (Schwab & Sala-i-Martin, 2014). A score of 1 indicates no compliance, and a score of 7 means that there is high compliance. Bangladesh has an environmental sustainability score of 3.35, whereas Vietnam’s value is 3.67 indicating that Vietnam has stricter environmental regulations.

V. Conclusions and Implications

This research investigated the comparative advantages of the Bangladesh and Vietnam’s apparel industries based on the GVC framework by comparing the two countries in terms of material supply, apparel manufacturing, transportation and logistics, and social and environmental sustainability. In this study, for the first time, the authors proposed the social and environmental sustainability indicators to expand the GVC framework. The updated GVC framework better reflects the changing priorities in the global apparel industry when buyers evaluate sourcing locations.

The research findings indicate that while the two countries have different strengths and weaknesses, Vietnam clearly emerged as a leader on most of the GVC components. A summary of comparative advantages of Bangladesh and Vietnam is presented in Table 7. The bolded segments highlight the comparative advantages of each country.
Table 7. Comparison of the Bangladeshi and Vietnamese apparel industries’ GVC activities

<table>
<thead>
<tr>
<th>GVC components</th>
<th>Bangladesh</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import priorities</td>
<td>Import more cotton fiber</td>
<td>Import more yarn and fabric</td>
</tr>
<tr>
<td>Quality and diversity of domestic textiles</td>
<td>Higher volumes of cotton fiber, yarn, and fabric production</td>
<td>Specializes in knit fabrics</td>
</tr>
<tr>
<td>Apparel manufacturing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor cost</td>
<td>Very low labor cost ($50/month)</td>
<td>Higher labor cost ($100-$150/month)</td>
</tr>
<tr>
<td>Number of apparel factories</td>
<td>6,000</td>
<td>4,500</td>
</tr>
<tr>
<td>Productivity</td>
<td>Low (103)</td>
<td>High (23)</td>
</tr>
<tr>
<td>Workforce skills</td>
<td>Low workers’ skills and training</td>
<td>Skilled and trained workers</td>
</tr>
<tr>
<td>Manufacturing quality</td>
<td>Inconsistent and lower product quality</td>
<td>High quality products</td>
</tr>
<tr>
<td>Adaptability</td>
<td>Lean manufacturing</td>
<td>Agile manufacturing</td>
</tr>
<tr>
<td>Full-package production</td>
<td>Mostly CMT-based</td>
<td>Early stage of providing full-package production</td>
</tr>
<tr>
<td>Transportation/logistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Poor (138)</td>
<td>Acceptable (44)</td>
</tr>
<tr>
<td>Energy supply</td>
<td>Energy supply at risk (127)</td>
<td>Reliable energy supply (81)</td>
</tr>
<tr>
<td>Internet and technology use</td>
<td>Low (131)</td>
<td>Acceptable (86)</td>
</tr>
<tr>
<td>Custom services</td>
<td>Poor (138)</td>
<td>Average (61)</td>
</tr>
<tr>
<td>Shipment timeliness</td>
<td>Low (80)</td>
<td>Acceptable (42)</td>
</tr>
<tr>
<td>Social and environmental sustainability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social sustainability</td>
<td>Lower (3.65 out of 7)</td>
<td>Higher (4.11 out of 7)</td>
</tr>
<tr>
<td>Safety</td>
<td>High-profile problems of building and fire safety</td>
<td>Acceptable workers’ safety</td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>Lower compliance (3.35)</td>
<td>Higher compliance (3.67)</td>
</tr>
</tbody>
</table>

Bangladesh’s major comparative advantage lies in lower wages, ability to produce high volume orders, and lean manufacturing. The Bangladeshi apparel industry benefits from domestic cotton production and manufacturing yarn and fabric (mostly cotton). At the same time, domestic supply of raw materials is not sufficient to support the fast growing apparel industry. The country is dependent on importing high volumes of cotton and fabric. Low workers’ skills and training inhibit producing quality apparel. Bangladesh is clearly behind on infrastructure, communication, and logistics services, which substantially increase lead time and costs of doing business in the country.

Even though Vietnam’s labor cost is two-three times higher than in Bangladesh, it is compensated by higher productivity of skilled and better trained workers. As a result of proficient workforce, Vietnamese apparel industry’s comparative advantage lies in its ability to produce intricate styles, higher quality apparel as well as agile and flexible manufacturing. The country has significantly more developed infrastructure, communication, and logistics services, resulting in shorter lead times and a more conducive business environment. On the downside, Vietnam has insufficient domestic raw material supply and primarily relies on textile imports. Vietnam’s flexible and agile manufacturing practices are suited for companies with a just-in-time business model with lower inventory and
reduced time to market (Azmeh & Nadvi, 2014). Another important comparative advantage is a greater social and environmental compliance in Vietnam’s apparel industry, in comparison with Bangladesh. In addition, Vietnam is ahead of Bangladesh in offering full-package apparel manufacturing. This also contributes to the higher quality and shorter lead times in Vietnamese factories.

In conclusion, choosing between Bangladesh and Vietnam when sourcing apparel assembly will depend on the company’s business model and the type of product they want to manufacture. For fashion driven companies that need higher quality, faster delivery, greater overall efficiency in producing more complex styles, Vietnam might be a better choice. In contrast, Bangladesh might be a better choice for high volume driven companies that offer basic apparel and better value for their consumers. The findings demonstrate that Bangladesh and Vietnam are filling unique niches in the global apparel industry.

VI. Limitations of the Study and Recommendations for Future Studies

This study focused on the components of the GVC in the two fast growing apparel producing and exporting countries, Bangladesh and Vietnam. Future studies could focus on analyzing the stages of the industry life-cycle, ownership, and activities of apparel firms. Other emerging countries such as Cambodia, Myanmar, or some Sub-Saharan African countries could also be included in future analyses to form a holistic picture of future centers for apparel manufacturing.

References


Examination of Two Decades in Used Clothing Trade: The Case of the United States and Selected Developed Economies

Youngji Lee†, Ling Zhang, and Elena Karpova
Dept. of Apparel, Events, and Hospitality Management, Iowa State University, USA

Abstract

This research examined two decades of the U.S. used clothing exports to the world. All countries (209) were classified into four groups based on the level of economic development. Between 1996 and 2012, U.S. used clothing exports shifted away from low-income economies to high-income economies. For the first time, our research demonstrated that the majority of used clothing discarded by American consumers is exported to high-income economies instead of poorest nations of the world. Next, used clothing exports and imports by volume and value in seven high-income countries were analyzed. The high-income countries not only exported but also imported significant amount of used clothing, which indicates a growing demand for worn apparel in developed nations. The demand might be at least partially attributed to the popular vintage clothing trend and increasing consumer environmentalism. Implications regarding development and implementation of a new classification system of worn clothing and recommendations for future research are presented.

Keywords: second-hand clothing, used clothing trade, worn apparel

I. Introduction

With fast changing fashion trends, consumers have been buying and disposing more clothing every year (Allwood, Laursen, Rodriguez, & Bocken, 2006), throwing away more than 13 million tons of textiles per annum (U.S. Environmental Protection Agency, n.d.). Few consumers are changing their consumption practices to more sustainable, for example, by buying used clothing even when they can afford to buy new (Hustvedt & Dickson, 2009). Used clothing is apparel “that has been previously purchased and used” (Mhango & Niehm, 2005, p. 342). Many consumers donate no longer wanted clothing to charities such as Goodwill or Salvation Army (Ha & Hodges, 2008).

The United States (US) is the world’s top exporter of used clothing (Rivoli, 2009). It is a well-known fact that the country exports clothing to low-income nations. Interestingly, the US has also been exporting used clothing to many developed economies...
(Office of Textiles and Apparel[OTEXA], 2013). In fact, Canada, Germany, Japan, Italy, South Korea, and United Kingdom (UK) are among major importers of U.S. used clothing (OTEXA, 2013).

Very little research exists on used clothing trade. Several extant studies focused on used clothing trade in low-income countries (Brooks, 2013; Hansen, 2004; Mhango & Niehm, 2005). To our knowledge, no research has examined used clothing trade between developed economies. The purpose of this study was to analyze trends in the U.S. used clothing exports to countries at different levels of economic development. A special examination was conducted on used clothing trade between developed countries.

II. Literature Review

1. The U.S. Used Clothing Industry

In the 1990-2000s, used merchandise industry grew rapidly in the United States, with many newly opened stores selling second-hand clothing (HighBeam Business, n. d.). Between 1997 and 2007, used merchandise sales grew by 55%, and the industry employment increased by 13% (U.S. Census Bureau, 2007). In 2010, the industry consisted of 17,866 stores and employed 144,113 workers (U.S. Census Bureau, 2010). America’s Research Group (as cited in HighBeam Business, n. d.) reports that 12-15% of U.S. consumers visit resale and consignment stores in any given year. It is a fairly high number in comparison with 11.4% consumers who visit factory outlet malls, 19.6% visiting specialty apparel stores, and 21.3%—major department stores.

Used clothing businesses sort donated apparel into three groups: “for sale as clothing, wiping rags, and fiber” (Rivoli, 2009, p. 220). During the sorting process, some clothing is hand-picked for its special value such as famous brands or vintage clothing. The latter has become a popular trend, with steadily growing demand, and has had a positive impact on the growth of used clothing industry (Cervellon, Carey, & Harms, 2012).

2. Used Clothing Trade

The global used clothing trade is a multimillion dollar business (Mhango & Niehm, 2005) that creates thousands of jobs around the world (Hansen, 2004). For decades, the US has been the world’s leader in exporting used clothing (Rivoli, 2009). In 2012, $770 million worth of used clothing traveled from the US to practically every country in the world: 209 nations imported apparel disposed by U.S. consumers (OTEXA, 2013). Extant research on used clothing trade has focused on some of the poorest countries in the world such as Malawi, Tanzania, and Zambia (Hansen, 2000, 2004; Mhango & Niehm, 2005; Rivoli, 2009).

While a lot of U.S. used clothing is destined to low-income nations in Africa, a significant portion of it is exported to developed countries such as Canada, Germany, Japan, and Italy (OTEXA, 2013). However, no research has investigated U.S. used clothing exports to countries at different levels of economic development and how these export trends have evolved over time. Such investigation is important because it allows for a better understanding of supply and demand dynamics in the relatively young but fast growing used clothing industry and trade.

III. Method

To examine trends in the U.S. used clothing exports, secondary data were collected and analyzed. Based on the Harmonized Tariff Schedule (HTS) classification, trade data categorized as “worn clothing and other worn articles”
HTS 630900) were collected from government and trade statistic databases: OTEXA (2013) and United Nations (UN) Comtrade (2013). HTS 630900 is the only existing category that accounts for used clothing trade and no further subdivision by type of product, fiber content, or any other characteristic is currently available. Total U.S. exports of used clothing in volume (kg) were collected from OTEXA for the 1996-2012 period.

To examine patterns in the U.S. used clothing exports to countries at different levels of economic development, all 209 countries that imported used clothing from the US between 1996 and 2012 were classified into four groups by gross national income (GNI) per capita (World Bank, 2012). According to the World Bank, in 2012, all 214 world’s countries were divided into four groups as: (a) low-income economies with GNI per capita of $1,025 and less; (b) lower-middle-income economies with GNI per capita between $1,026 and $4,035; (c) upper-middle-income economies with GNI per capita between $4,036 and $12,475; and (d) high-income economies with GNI per capita of $12,476 and more. To compare U.S. used clothing exports to countries at different levels of economic development, all 209 countries that imported U.S. used clothing during the 1996-2012 period were classified into one of the four income groups.

For a more detailed examination of used clothing trade in high-income nations, in addition to the US, six other developed economies were selected: Canada, Germany, Japan, Italy, South Korea, and UK. These countries were selected because: (a) they are among the top ten high-income economies that import the U.S. used clothing; and (b) they are considered fully developed economies with sophisticated consumer markets and mature domestic apparel industries. For these seven high-income countries, used clothing import and export data were collected in both volume and value (UN Comtrade, 2013). The data were collected for the 1990-2011 period based on the availability of the data for the selected countries.

The goals of the analysis were: (a) to investigate 1996-2012 trends in the U.S. used clothing exports to the four groups of countries at different levels of economic development; and (b) to examine patterns in used clothing trade (export and import) in the seven high-income countries that are main importers of the U.S. used clothing.

IV. Results


Figure 1 and Table 1 display aggregated U.S. exports to all 209 countries grouped by the level of economic development. During the seventeen-year period, total U.S. export of used clothing increased 3.5 times: from 219 million kg in 1996 to 770 million kg in 2012. The exports remained relatively stable in the 1990s, whereas the 2000s saw sharp increases. With the exception of short-term declines (in 2001, 2003, and 2007), the overall 2000-2012 trend showed a strong growth. A significant increase in used clothing exports between 2007 and 2008 might be attributed to the global financial crisis that started in 2007 and resulted in demand for a less expensive substitute of new apparel.

Between 1996 and 2004, total U.S. used clothing exports more than doubled (130% overall increase), with the early 2000s accounting for the majority of the growth. Between 2004 and 2012, the growth trend continued and constituted another 53%. A total of 139 countries imported U.S. used clothing in 1996. In 2012, the number of countries that imported U.S. used clothing has increased to 159. Interestingly, the major growth in the number of countries was from the upper-middle- and high-income countries.
Figure 1. U.S. used clothing exports to countries at different levels of economic development

Table 1. U.S. used clothing exports to countries based on economic development level

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1996</td>
<td>2004</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>Low-income (n=34)</td>
<td>69,806,550</td>
<td>70,415,537</td>
<td>91,002,373</td>
<td>0.87%</td>
</tr>
<tr>
<td>Lower-middle-income (n=48)</td>
<td>65,502,893</td>
<td>136,924,373</td>
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<tr>
<td>Upper-middle-income (n=54)</td>
<td>38,428,312</td>
<td>75,283,837</td>
<td>143,834,243</td>
<td>95.91%</td>
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<tr>
<td>High-income (n=73)</td>
<td>44,757,002</td>
<td>220,824,109</td>
<td>247,723,213</td>
<td>393.38%</td>
</tr>
<tr>
<td>Total (n=209)</td>
<td>218,494,757</td>
<td>503,447,856</td>
<td>769,564,249</td>
<td>130.42%</td>
</tr>
</tbody>
</table>

Note. $n =$ total number of countries that imported used clothing from the US during 1996-2012.
1.1. US exports to low-income countries

The U.S. used clothing exports to low-income countries remained flat (Figure 1). In 1996, the country exported almost 70 million kg to 28 low-income nations. In 2004, the exports remained almost the same, 70.4 million kg, even though in the same period the total U.S. exports increased by 130%. Over the eight-year period, the share of the total U.S. used clothing exports to the poorest economies dropped by more than half: from 32% in 1996 to only 14% in 2004. In 2012, 27 low-income countries imported 91 million kg of used clothing, which was only 12% of the total U.S. used clothing exports.

In 1996, the top importers in the low-income group included Niger, Haiti, Benin, Tanzania, and Congo—all African countries with the exception of Haiti. In 2012, Tanzania and Congo remained among the top importers, with an addition of three other African countries: Kenya, Liberia, and Mozambique. Even though used clothing exports from the US to low-income countries increased by 30% between 1996 and 2012, the proportion in the total U.S. used clothing exports has dropped from one-third in 1996 (32%) to slightly more than one-tenth in 2012 (12%).

1.2. US exports to lower-middle-income countries

U.S. used clothing exports to lower-middle-income countries increased four times over the seventeen-year period, or a 338% overall growth: from 65.5 million kg in 1996 to 287 million kg in 2012 (Figure 1). The sharpest increase was in 2009-2010, which might be explained by the global economic crisis and a declined spending for new apparel. The share of the total U.S. exports to this group of countries increased during the period from 30% in 1996 to 37% in 2012. The total number of countries in this group remained relatively stable: 32 nations in 1996 and 37 nations in 2012. The countries in the lower-middle-income group were primarily from the Asian region, with several countries from Africa and South/Central America. By 2012, four of the top five importing nations remained the same as in 1996, with an addition of Honduras: India, Guatemala, Philippines, and Pakistan (Table 1).

1.3. US exports to upper-middle-income countries

U.S. used clothing exports to upper-middle-income countries recorded a gradual increase (Figure 1). In 1996, 35 countries imported 38 million kg, or almost 18% of the total U.S. used clothing exports. The top five importers were Mexico, Chile, Angola, Tunisia, and Jordan. In 2004, 39 countries imported almost doubled the amount: 75.3 million kg, or 15% of the total U.S. used clothing exports. The top five importers in 2004 were Chile, Dominican Republic, Angola, Malaysia, and Turkey. In 2012, the U.S. exports to this group of countries showed another double increase (144 million kg) and constituted 19% of the total U.S. exports. Chile, Dominican Republic, Angola, and Malaysia remained among the top five importers, with a return of Tunisia. Overall, between 1996 and 2012, U.S. exports to the upper-middle-income countries had a 274% growth, yet the increase was lower than in the lower-middle-income countries (338%). At the same time, the share of the upper-middle-income countries in the total U.S. used clothing exports remained stable: 18% in 1996 and 19% in 2012.

1.4. US exports to high-income countries

U.S. used clothing exports to high-income countries had the most dynamic change in comparison to the other three groups (Figure 1). In 1996, 44 high-income countries imported 45 million kg, or 21% of the total U.S. used clothing exports (Table 1). The top five importers were Canada, Netherlands, Singapore, Japan, and Germany. In 2004, the exports jumped more than four times to 220.8 million kg. The number of countries importing U.S. used clothing
increased to 50. The top five importers were Canada, United Arab Emirates, Japan, Poland, and Trinidad and Tobago. After 2006, the trend has flattened. In 2012, the exports to the high-income countries were 248 million kg, which was almost one-third (32%) of the total used clothing exported by the US. The top five importing countries were Canada, United Arab Emirates, Oman, Slovak Republic, and Germany.

Overall, U.S. exports to high-income countries increased from 45 million kg in 1996 to 248 million kg in 2012, a 453% growth. This was the highest growth among the four groups of countries by the level of economic development. Between 2001 and 2012, the high-income countries imported substantially more used clothing from the US than the low-income countries. In addition, this group imported more used clothing than any of the four groups between 2004 and 2008. The overall trend in the U.S. total exports repeats the export trend of the high-income countries, especially between 1996 and 2009 (Figure 1).

2. Used Clothing Trade in High-Income Countries, 1990-2011

2.1. Used clothing import values

To better understand used clothing trade in developed economies, trends in total used clothing imports and exports in both value (USD) and volume (kg) for seven high-income countries were examined between 1990 and 2011. The countries included Canada, Germany, Italy, Japan, South Korea, UK, and US. All countries, with the exception of the US and Japan, showed a continuing increase in used clothing import values during the past two decades (Figure 2). Overall, the values of U.S. used clothing imports remained relatively flat during the 20+ years and ranged between $3 and $9 million. The import values of used clothing in Japan increased sharply in the early 1990s from $9 million in 1990 to almost $120 million in 1995 almost a 1,230% increase, and then dipped in 1998 to slightly more than $40 million, which was likely due to the Asian economic crisis (Nanto, 1998). In 1995, Japan imported 1.6 times more

![Figure 2. Used clothing imports in value (USD) for seven high-income countries, 1990-2011](image-url)
used clothing, in value, than all other six high-income countries combined. Japan remained the top used clothing importer until 2005, when Canada became the leader. In 2011, Canada imported $87 million of used clothing from the world, followed by Germany ($69 million), Italy ($37 million), South Korea ($36 million), and UK ($29 million). In the 1990s, South Korea had the lowest used clothing imports among the seven countries (less than $2 million). However, it had a sharp increase, $36 million by 2011 (around 1,800% overall increase from 1990, surpassing UK, Japan, and the US.

2.2. Used clothing export values

Between 1990 and 2011, used clothing export values continually increased for all seven countries (Figure 3). The US was the top exporter during the entire period, whereas it had the lowest import numbers (Figure 2). In 2011, the country exported 100 times more of used clothing ($605 million) than it imported ($6 million).

In 2011, UK ($499 million) and Germany’s ($425 million) exports closely followed the US exports. The two countries also exported substantially more used clothing than they imported (6 to 20 times more). South Korea had a fast growth after 2006: its used clothing exports reached $310 million in 2011, 215% increase in comparison with 2006. Used clothing export values for Canada, Italy, and Japan remained relatively flat and did not exceed $100 million until the late 2000s. In 2011, the three countries exports of used clothing were just below $200 million.

Interestingly, Japanese import values were higher than its export values between 1993 and 2006. For example, in 1995, it imported almost three times more of used clothing ($118 million) than it exported ($44 million). Japan was the only high-income country examined in the study where used clothing import values were higher than export values, indicating a strong demand for used clothing in the market.

![Figure 3. Used clothing exports in value (USD) for seven high-income countries, 1990-2011.](image-url)
2.3. Used clothing import volume

In comparison with import values, there were quite different patterns in used clothing import volume (Figure 4). Between 2001 and 2006, Canada had a very sharp increase in import volume (648%), securing the top position in the group. In both 2005 and 2006, the country imported almost 260 million kg, which was roughly a double of the amount imported by all other six countries combined.

Japanese import volumes (between 1 and 8 million kg) and U.S. imports (between 5 and 15 million kg) had a relatively flat trend and were the lowest in the group. In contrast, Japanese used clothing import values were one of the highest (Figure 2), indicating high value of imported used clothing per kg. Between the late 1990s and throughout the 2000s, Italy also recorded quite stable but much higher imports of roughly 50 million kg a year. South Korea, Germany, and UK demonstrated steadily increasing imports during the 2000s. In 2011, they imported 57, 53, and 26 million kg of used clothing, respectively.

Figure 4. Used clothing imports in volume (kg) for seven high-income countries, 1990-2011

2.4. Used clothing export volume

In terms of used clothing export volume (kg), the US again was the undisputed leader with 762 million kg in 2011 (Figure 5). Between 1991 and 2011, the country recorded a 430% increase in used clothing export by weight. In 2011, the US was followed by Germany (453 million kg), UK and South Korea (both around 320 million kg). Japan, Canada, and Italy’s used clothing exports remained relatively flat and were under 100 million kg until 2004, and less than 200 million between 2005 and 2011. It should be noted that between 2002 and 2011, Canada imported more used clothing by weight than it exported. For example, in 2002 the country imported 2.8 times more of used clothing, 129 million kg, than it exported, 48 million kg (Figures 4 and 5). It was the only country in the group where used clothing import volume was higher than export volume.
V. Conclusions and Implications

This study examined trends in the U.S. used clothing exports to countries at different levels of economic development. In 2011, the US exported 762 million kg of used clothing worth of $605 million. The belief has always been that clothing disposed by U.S. consumers was primarily destined to low-income countries. Our study showed that in 2012 only 12% of the total US used clothing was exported to low-income countries, whereas 30% was exported to high-income countries, such as Canada, Germany, Japan, Italy, South Korea, and others.

Between 1996 and 2012, the amount of U.S. used clothing exports increased 3.5 times. Structural shifts in the distribution of the total exports to countries at different levels of economic development were discovered. At the turn of the 21st century, the U.S. used clothing exports shifted away from less developed economies to more developed countries. The share of the U.S. total used clothing exports destined to the low-income countries went down from 32% in 1996 to 12% in 2012. In contrast, the share of the U.S. total used clothing exports to high-income countries increased from 21% in 1996 to 32% in 2012.

This study examined used clothing trade in seven high-income countries: Canada, Germany Italy, Japan, South Korea, UK, and US. Between 1990 and 2011, all seven countries not only exported but also imported significant volumes and values of used clothing, which implies a growing demand for secondhand apparel in developed nations. Canada had consistently imported more clothing by volume than it exported. Japan had imported more worn clothing by value than it exported. This finding poses an important question—why developed nations import a lot of used clothing, given that all of them have huge excesses of disposed clothing that they export to the world? It is plausible to assume that U.S. used clothing exported to other developed nations must be different from the used clothing these countries themselves export in large volumes. Otherwise, exporting and at the same time importing large amounts of
used clothing would not make any economic sense. There is no trade data available that might have helped to distinguish between used clothing imports and exports in high-income countries, but it is reasonable to assume that at least some of used clothing that is traded between high-income countries should be for resell as apparel rather than for extracting fibers to use as raw materials.

It is not likely that the seven high-income countries in this study would be importing the same type of used clothing, which they already have excess in domestic markets. Used clothing imported by high-income countries must have some unique value and characteristics to meet domestic consumer demand. Given that, we attribute the increase of used clothing trade between high-income countries, at least partially, to the growing popularity of vintage clothing. Cervellon et al. (2012) found that high education level and high income are the most salient characteristics of consumers who buy vintage clothing. Both characteristics are very much applicable to consumers in the seven high-income countries examined in the current study. Many young consumers in developed economies cannot afford, or choose not to invest in high-end clothing (Wetherille, 2011). Yet, consumers look for unique ways to express themselves through appearance (Cervellon et al., 2012). Vintage clothing offers the uniqueness, character, charm, and individuality, so it is in demand in these mature markets that are overcrowded with low-quality, cookie-cutter apparel from mass retailers. In addition, vintage clothing is a sustainable choice of apparel consumption and might be appealing to some environmentally conscious consumers. Thus, the eco movement and vintage trend might contributed to increases in U.S. used clothing exports to high-income countries and growing worn clothing imports in these countries.

It is unknown whether used clothing exports to high-income countries are of the same type and quality as exports to low-income countries. Currently, all used clothing trade is classified under HTS 630900 Worn clothing and other worn articles (United State International Trade Commission, 2013). There are no subdivisions available that would allow some type of classification for this bi-product of the contemporary consumer market. It is not possible to obtain any data on what type of used clothing is traded in the world and more specifically, between developed economies. This calls for the US and world trade organization policy makers to develop a new classification system of worn clothing for trade purposes so real value of used clothing exports and imports can be assessed and documented. Specifically, used clothing classification system by value, fiber content, type of clothing, merchandise condition, etc. needs to be developed and implemented. The new classification system can facilitate a more effective and efficient trade as well as re-use and recycling and divert more textiles from landfills.

Used clothing industry and trade continues to remain in the shade of the global economy, with little knowledge of how the industry operates. Similarly, little is known about used clothing demand and supply patterns. Several studies have examined used clothing distribution and resell in African countries (Hansen, 2000/2004; Mhango & Niehm, 2005; Rivoli, 2009), but scarce information is available on the topic of retailing imported used or vintage clothing in mature markets. Future research on used clothing industry and trade, particularly in high-income countries, might increase understanding and fill the gap in the literature on used clothing business.

References


Female Consumers’ Attitudes and Purchase Intentions toward Intimate Apparel Brands

Jennifer Rose, Eunjoo Cho†, and Kathleen R. Smith
School of Human Environmental Sciences, University of Arkansas, USA

Abstract

The purpose of this study was to examine female consumers’ attitudes and purchase intentions toward intimate apparel brands. To understand female consumers’ shopping behaviors for intimate apparel products, this study examined interrelationships among brand familiarity, perceived risk, attitudes, and purchase intentions toward intimate apparel brands. A conceptual model was developed by adopting perceived risk theory (Cox, 1967) and theory of reasoned action (Ajzen & Fishbein, 1980). A pre-survey using a paper and pencil was conducted to identify the most familiar intimate apparel brand to young female consumers. The majority of pre-survey respondents (66 female college students) indicated Victoria’s Secret as the most prominent intimate apparel brand. Therefore, Victoria’s Secret was used to examine possible effects of brand familiarity on perceived risk and attitudinal and behavioral responses toward the brand. Using a web-based survey, 384 complete responses were collected from young female college students between the ages of 18-29 at a Mid-southern U.S. university. A structural equation modeling was employed to test the proposed research model and hypotheses. Results showed positive, statistically significant associations among the four variables (e.g., brand familiarity, perceived risk, attitudes, and purchase intentions). The findings suggested that young female consumers who are familiar with a particular intimate apparel brand are likely to perceive a low level of risk, leading to positive, strong attitudes with purchase intentions toward that particular intimate apparel brand. This suggests establishing brand familiarity through integrated marketing communication is crucial for risk reduction strategy in intimate apparel shopping.

Keywords: brand familiarity, risk, attitudes, purchase intentions, intimate apparel

I. Introduction

Intimate apparel is inevitable in daily life providing protection, comfort and support between the body and outerwear to enhance the physical appearance of body contours. Often synonymous with lingerie or underwear, most intimate apparel relates to
Female Consumers’ Attitudes and Purchase Intentions toward Intimate Apparel Brands

II. Literature Review

1. Theoretical Framework

Perceived risk theory and the TRA served as a theoretical framework of this study. These two theories are most relevant in exploring how brand familiarity relates to perceived risk in intimate apparel shopping, which in turn influences attitudes and purchase intentions toward intimate apparel brands as shown in the proposed model (see discrete or inconspicuous garments worn close to the skin such as bras, panties, and sleepwear (Filipe, Montagna, & Carvalho, 2011; Hume & Mills, 2013). Previous studies have revealed that most female consumers have difficulty in finding well-fitting as well as aesthetically pleasant intimate apparel products. For instance, national consumer surveys conducted in North America and the United Kingdom revealed that the vast majority of female consumers feel frustrated and frequently dissatisfied with intimate apparel purchases (Hart & Dewsnap, 2001).

Female consumers tend to perceive a high level of mis-purchase risk (e.g. financial loss and poor fit after washing) and to encounter certain unfavorable factors, such as inconsistent sizing and variation in fit across different brands and even within the same brand (Hart & Dewsnap, 2001). To avoid such mis-purchasing risk, female consumers are likely to remain faithful to previous choices and buy the same intimate apparel from the same brand from which they used to buy (Filipe et al., 2011; Hart & Dewsnap, 2001). This may suggest that the level of perceived risk is found to be greater for buying intimate apparel than buying other apparel products.

As noted above, female consumers tend to perceive greater risks in purchasing intimate apparel compared to other apparel products. When consumers perceive risk, they are likely to assess stored information to reduce the amount of risk in order to increase certainty (Bauer, 1960). Prior research has found that consumers are likely to purchase apparel from well-known brands because they feel confident in their ability to evaluate product value (Park & Stoel, 2005). Compared to unknown brand names, well-known brand names decrease a consumer’s perception of risk, thereby increasing positive perceptions of the brand and, in turn, increasing purchase intentions (Park & Lennon, 2009). These findings imply that brand familiarity may take a significant role in decreasing perceived risk when purchasing intimate apparel.

Most of the previous research focused on studying how to reduce perceived risk and to increase purchase intentions for outer apparel shopping, while few researchers have investigated factors influencing purchase intentions toward intimate apparel brands. For instance, one qualitative study (Hart & Dewsnap, 2001) has revealed the importance of risk reduction in intimate apparel shopping. A quantitative investigation is necessary to better understand intimate apparel purchase behaviors by exploring factors that might lower the perception of risk in intimate apparel shopping.

This study adopted perceived risk theory (Cox, 1967) and the theory of reasoned action (TRA; Ajzen & Fishbein, 1980). Perceived risk theory explains that consumers utilize stored information to reduce undesirable consequences in the purchase decision process. According to the TRA, beliefs about behaviors/objects affect the attitudes and subsequent intentions regarding the particular behaviors/objects. A well-known brand provides better recall (Kent & Allen, 1994) and lowers the level of risk perception, which may increase attitudes and purchase intentions toward the brand. Therefore, the purpose of this research was to examine the effects of brand familiarity on perceived risk of intimate apparel shopping, which would affect attitudinal and behavioral responses toward intimate apparel brands. A well-known U.S. intimate apparel brand, Victoria’s Secret, was used to explore consumers’ real intimate apparel shopping behavior.
Figure 1).

Perceived risk theory proposes that consumers encounter risk when they expect undesirable consequences due to uncertainty in the decision making process (Bauer, 1960). Consumer behavior is involved with risk taking because there are not only pleasant but unpleasant results from the decisions. According to Bauer (1960), consumers tend to develop a variety of risk reduction strategies in order to improve the consequences of their purchase decisions. In line with Bauer’s (1960) theory, Cox (1967) hypothesized that consumers cope with judgmental tasks by evaluating new or stored information in an attempt to reduce the expected negative consequences and to increase certainty. Cox (1967) explained that a level of risk is modifiable depending on a degree of certainty; consumers perceive a low level of risk when they feel confident in their decision based on stored information and past experience. As consumers’ desire to acquire satisfying consequences becomes greater, they search for internal information to improve the consequences from their decision. Internal information is prior brand-related indirect and/or direct experiences such as exposure to advertisements, shopping experiences in a store or online, and purchase or usage of the brand (Park & Stoel, 2005). Such prior brand-related experiences form brand familiarity, which influences confidence in brand evaluation (Laroche, Kim, & Zhou, 1996; Park & Stoel, 2005).

The TRA posits that intentions toward a particular behavior is determined by a person’s attitudes toward the behavior and subjective norms (Ajzen & Fishbein, 1980). Attitudes toward a behavior are comprised of beliefs used to evaluate positive or negative outcomes. Subjective norms refer to social pressures to perform or not perform the behavior. The TRA explains that intentions to purchase a product are formed by a combination of favorable attitudes toward a behavior and a strong social pressure from significant referents. This theory has been used in numerous studies to predict purchase intentions and purchase behavior for apparel products. (e.g., Belleau, Summers, Xu, & Pinel, 2007; Han & Chung, 2014; Kang & Kim, 2013). Ajzen and Fishbein (1980) also indicated that other variables might have some influence on behavioral intentions. Researchers have suggested that past behaviors and prior experiences could be included in the model to predict behavioral intentions (Bagozzi, Wong, Abe, & Bergami, 2000). Thus, it is possible to include brand familiarity and perceived risk in the model which would contribute to predicting attitudes and purchase intentions.

2. Brand Familiarity, Perceived Risk, Attitudes, and Purchase Intentions

Consumers become familiar with a brand through advertising and promotion exposures, in-store product display, trial, purchase, consumption, and online/offline referral communications (Alba & Hutchinson, 1987). These experiences with a brand contribute to building a high level of knowledge about the brand (Campbell & Keller, 2003), which increase consumers’ confidence in the brand. Researchers have consistently found that familiarity with a brand affects a level of perceived risk; consumers, who are familiar with the brand, feel confident in the product attributes and benefits so that they perceive less risk (Laroche et al., 1996; Park & Stoel, 2005).

Familiar brands are more highly recognized and preferred by consumers than unfamiliar brands (Colombo & Morrison, 1989; Kent & Allen, 1994). Previous studies have shown that consumers are more likely to have positive attitudes and purchase intentions toward purchasing products from familiar apparel brands (Chen & Liu, 2004; Laroche et al., 1996; Park & Stoel, 2005). A recent study of intimate apparel shopping in Portugal found that more than 65% of women purchased the same bra from familiar intimate apparel brands because of their known
expectations (Filipe et al., 2011). Likewise, well-known brands provide better recall (Kent & Allen, 1994), in turn, a low level of risk perception, which may increase attitudes and purchase intentions toward the brand. Based on the literature reviewed, the following three hypotheses are proposed:

**Hypothesis 1:** Brand familiarity will influence perceived risk toward intimate apparel brands.

**Hypothesis 2:** Brand familiarity will influence attitudes toward intimate apparel brands.

**Hypothesis 3:** Brand familiarity will influence purchase intentions toward intimate apparel brands.

### 3. Perceived Risk, Attitudes, and Purchase Intentions

Numerous studies have confirmed that perceived risk affects consumers’ attitudes (Featherman & Pavlou, 2003; Lee, Kim, & Fiore, 2010; Park & Kim, 2007; Verhagen, Meents, & Tan, 2006) and purchase intentions (Choi & Lee, 2003; Gaal & Burns, 2001; Han & Chung, 2014; Jin & Koh, 1999; Park, Lennon, & Stoel, 2005). For instance, two online shopping studies found that perceived risk negatively influenced attitudes toward online retailers (Lee et al., 2010; Verhagen et al., 2006). Those researchers also provided empirical results showing a negative relationship between perceived risk and purchase intentions. Han and Chung (2014) indicated the influence of perceived financial risk on the purchase of organic cotton apparel. Similarly, Park et al. (2005) confirmed that reduced perceived risk augment consumers’ intentions to purchase apparel from the internet. The following two hypotheses are proposed:

**Hypothesis 4:** Perceived risk will influence attitudes toward intimate apparel brands.

**Hypothesis 5:** Perceived risk will influence purchase intentions toward intimate apparel brands.

### 4. Attitudes and Purchase Intentions toward Intimate Apparel Brands

According to TRA, a person’s attitudes toward a behavior positively influence the behavior (Ajzen & Fishbein, 1980). The positive influence from attitudes on purchase intentions toward apparel shopping has been confirmed by numerous empirical research (Han & Chung, 2014; Kang & Kim, 2013; Lee, Fiore, & Kim, 2006; Park & Kim, 2007; Yoh, Damhorst, Sapp, & Lacznia, 2003). For instance, two studies (Park & Kim, 2007; Yoh et al., 2003) found that attitudes directly influenced purchase intentions for online apparel shopping. Han and Chung (2014) found attitudes had a significant effect on consumers’ intentions toward the purchase of organic cotton apparel. As the relationship among attitudes and purchase intentions was explored in an outer apparel shopping context, it may be plausible to suggest a positive relationship for intimate apparel shopping. The following proposed hypothesis is:

**Hypothesis 6:** Attitudes toward an intimate apparel brand will positively relate to purchase intentions toward intimate apparel brands.

### III. Method

#### 1. Sample

An online survey was conducted to female college students and alumni at a large Mid-southern U.S. university. With the approval for the use of human subjects from the University Institutional Review Board, the survey was distributed to 3,615 female college students and alumni. The inclusion of college students and alumni provided a wide range of ages and geographic locations, which enhanced the external validity of the analyses.
2. Survey Instrument

A pre-survey was conducted to identify the most familiar intimate apparel brand. A convenience sample of 73 female college students participated in a paper-pencil survey. Students were asked two questions: “What is the first brand that comes to mind when you think of purchasing intimate apparel?” and “What is the second brand that comes to mind when you think of purchasing intimate apparel?” The majority of respondents (90%) indicated Victoria’s Secret as the most prominent brand followed by Aerie. Therefore, the well-known Victoria’s Secret brand was used to examine possible effects of brand familiarity on perceived risk and attitudinal and behavioral responses toward the brand.

Reliable and valid measures from previous research were adopted and modified to assess the four variables. Brand familiarity was measured using Kent and Allen’s (1994) five-item scales (alpha = .85). Perceived risk was accessed with 12 items, including performance risk, psychological risk, financial risk, and time/convenience risk constructs adopted from previous studies (Han & Chung, 2014; Kim & Lennon, 2000; Park & Kim, 2007; Yu, Lee, & Damhorst, 2012; alpha = .71 - .92). Seven-item attitudes scales and five-item purchase intentions scales were adopted from Lee et al. (2006; alpha = .97 - .98). The survey included demographic items: gender, age, ethnicity, education attainment, occupation, and annual household income. A 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), was used for all variables, except demographic questionnaire.

IV. Results

1. Demographic Characteristics

A total of 384 responses were received that resulted in a response rate of 10.6%. Because 16 surveys had missing or irrelevant data (e.g. incomplete, male gender, undisclosed gender), 368 responses were usable for the statistical analysis. Ages ranged from 18 to 64 with the mean of 25 years. A majority of the respondents (85%) identified as highly-educated young Caucasian or European American women between 18 and 29 years. Most of the respondents (81.8%) indicated that they are currently working on Bachelor’s degrees or had already obtained the degree. Almost 32% of the respondents reported that their household income was $50,000 or less, 34% of respondents’ household income was between $50,000 and $75,000, and 34.3% of respondents stated their household income was over $100,000. Students without incomes reported their parents’ household income. Table 1 shows demographic characteristics of the sample.

2. Exploratory Factor Analysis and Reliability Analysis

An exploratory factor analysis (EFA) with varimax rotation extracted one factor for each construct with an Eigenvalue greater than 1.0 (see Table 2). Items were retained if standardized factor loadings were above .50 on the factor but below .30 on the other factors. Items were excluded for cross-loading on two or more factors (Nunnally & Bernstein, 1994). A Cronbach’s alpha value above .70 was acceptable for internal consistency (Nunnally & Bernstein, 1994). All factor loadings of the retained items were greater than .73. Reliability was supported for all four variables (≥ .85). The correlation coefficients between variables of the model ranged from .43 to .77 (see Table 3), which confirmed significant relationships among the variables.
Table 1. Demographic characteristics of sample (n = 368)

<table>
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<td>Two or more races</td>
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<td>Education</td>
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<td>Some college, no degree</td>
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<td>Bachelor’s degree</td>
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<td>(Student could indicate parents’ household income.)</td>
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<td>$50,000-74,999</td>
<td>67</td>
<td>18.4</td>
</tr>
<tr>
<td>$75,000-99,999</td>
<td>57</td>
<td>15.7</td>
</tr>
<tr>
<td>$100,000 or more</td>
<td>125</td>
<td>34.3</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture, forestry, fishing and hunting, etc.</td>
<td>19</td>
<td>5.2</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation, etc.</td>
<td>14</td>
<td>3.8</td>
</tr>
<tr>
<td>College student</td>
<td>229</td>
<td>62.2</td>
</tr>
<tr>
<td>Educational services, and health care, etc.</td>
<td>34</td>
<td>9.2</td>
</tr>
<tr>
<td>Finance and insurance, real estate, etc.</td>
<td>7</td>
<td>1.9</td>
</tr>
<tr>
<td>Information and technology</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Professional, scientific, and management, etc.</td>
<td>14</td>
<td>3.8</td>
</tr>
<tr>
<td>Retail trade</td>
<td>21</td>
<td>5.7</td>
</tr>
<tr>
<td>Transportation and warehousing, etc.</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>3</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Table 2. Results of exploratory factor analysis and reliability for variables (n=368)

<table>
<thead>
<tr>
<th>Constructs and items</th>
<th>Standardized factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand familiarity (α = .89)</td>
<td></td>
</tr>
<tr>
<td>Regarding this intimate apparel brand, I am:</td>
<td></td>
</tr>
<tr>
<td>1. Very inexperienced/very experienced</td>
<td>.80</td>
</tr>
<tr>
<td>2. Very unfamiliar/very familiar</td>
<td>.85</td>
</tr>
<tr>
<td>3. Very unknowledgeable/very knowledgeable</td>
<td>.93</td>
</tr>
<tr>
<td>Perceived risk (α = .84)</td>
<td></td>
</tr>
<tr>
<td>1. How much risk would you say would be involved with purchasing the intimate apparel from this brand?</td>
<td>- .55</td>
</tr>
<tr>
<td>2. The intimate apparel from this brand will not fit my style.</td>
<td>- .82</td>
</tr>
<tr>
<td>3. The intimate apparel from this brand will not look good on me.</td>
<td>- .74</td>
</tr>
<tr>
<td>4. I will not wear the intimate apparel from this brand.</td>
<td>- .81</td>
</tr>
<tr>
<td>Attitudes (α = .94)</td>
<td></td>
</tr>
<tr>
<td>If I were actually shopping for intimate apparel, this brand would be:</td>
<td></td>
</tr>
<tr>
<td>1. Excellent</td>
<td>.89</td>
</tr>
<tr>
<td>2. Good</td>
<td>.81</td>
</tr>
<tr>
<td>3. Interesting</td>
<td>.74</td>
</tr>
<tr>
<td>4. Pleasant</td>
<td>.84</td>
</tr>
<tr>
<td>5. Superior</td>
<td>.81</td>
</tr>
<tr>
<td>6. Useful</td>
<td>.82</td>
</tr>
<tr>
<td>7. Worthwhile</td>
<td>.91</td>
</tr>
<tr>
<td>Purchase intentions (α = .96)</td>
<td></td>
</tr>
<tr>
<td>1. I intend to buy the intimate apparel from this brand.</td>
<td>.93</td>
</tr>
<tr>
<td>2. I would be willing to buy the intimate apparel from this brand.</td>
<td>.87</td>
</tr>
<tr>
<td>3. I would be willing to recommend this brand to my friends.</td>
<td>.90</td>
</tr>
<tr>
<td>4. I would visit this brand again.</td>
<td>.95</td>
</tr>
<tr>
<td>5. In the future, I would likely shop at this brand.</td>
<td>.95</td>
</tr>
</tbody>
</table>

Table 3. Correlation results between the variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brand familiarity</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Perceived risk</td>
<td>.55**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Attitudes</td>
<td>.43**</td>
<td>.56**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Purchase intentions</td>
<td>.59**</td>
<td>.77**</td>
<td>.61**</td>
<td>1</td>
</tr>
<tr>
<td>Mean</td>
<td>3.92</td>
<td>2.00</td>
<td>3.84</td>
<td>4.10</td>
</tr>
<tr>
<td>SD</td>
<td>.85</td>
<td>.83</td>
<td>.85</td>
<td>.89</td>
</tr>
</tbody>
</table>

Note: significant; ** p ≤ .01
3. Measurement Model Testing

The measurement model which consisted of four variables was tested using structural equation modeling (SEM) in Mplus 7.0. The fit of the measurement model was examined by using maximum-likelihood estimation, which minimizes residuals between the observed and implied matrix. Three parcels were created for each latent variable by distributing standardized factor loadings evenly into the three parcels. Goodness-of-fit indices were reported: the comparative fit index (CFI; ≥ 0.95), root mean square error of approximation (RMSEA; ≤ 0.08), and standardized root mean square residual values (SRMR ≤ 0.08; Hu & Bentler, 1999). The measurement model fit the data well: \[ \chi^2 = 115.17 \ (df = 48), \ p \leq .001, \ CFI = .99, \ RMSEA = .06, \ SRMR = .03. \]

4. Structural Model and Hypotheses Testing

A structural equation model was estimated with Mplus 7.0 using the maximum-likelihood estimation procedure. Figure 1 provides path coefficients and t-values for each path as well as the fit indices of the model. The fit indices for the model showed that structural models fit the data well: \[ \chi^2 = 115.17 \ (df = 48), \ p \leq .001, \ CFI = .99, \ TLI = .98, \ RMSEA = .06, \ SRMR = .03, \] according to Hu and Bentler (1999). All hypothesized relationships in the SEM model were statistically significant (\( p \leq .001 \)), with the exception of the path from brand familiarity to attitudes. H1, predicting a positive relationship between brand familiarity and perceived risk was supported (\( \gamma = .65, \ t = 17.85, \ p \leq .001 \)). Conversely, H2, brand familiarity did not have a significant effect on attitudes toward an intimate apparel brand (\( \gamma = .07, \ t = 1.07 \)). H3, the effect of brand familiarity on purchase intentions toward an intimate apparel brand was statistically supported (\( \gamma = .10, \ t = 2.28, \ p \leq .05 \)). H4, the perceived risk had a significant influence on attitudes toward an intimate apparel (\( \gamma = .62, \ t = 11.16, \ p \leq .001 \)). H5, the effect of perceived risk on purchase intentions toward the intimate apparel brand was also supported (\( \gamma = .72, \ t = 14.67, \ p \leq .001 \)). Finally, H6, attitudes were found to have a significant effect on purchase intentions toward an intimate apparel brand (\( \gamma = .11, \ t = 2.57, \ p \leq .05 \)).

```
Note: \( \chi^2 = 115.17 \ (df = 48), \ p \leq .001, \ CFI = .99, \ TLI = .98, \ RMSEA = .06, \ SRMR = .03. \)
Path coefficients are indicated, t-values are in parentheses
- - - - - No effect, \( \longrightarrow \) Significant effect; * \( p \leq .05 \), *** \( p \leq .001 \)
```

Figure 1, Statistical results for structural model of brand familiarity, perceived risk, attitudes, and purchase intentions
V. Discussion and Conclusion

This study examined the effects of brand familiarity on perceived risk of intimate apparel shopping, which affects attitudinal and behavioral responses toward intimate apparel brands. The present study academically contributes to the body of research on intimate apparel shopping as few researchers have investigated factors influencing purchase intentions toward intimate apparel brands. The findings of the present study showed that female consumers who are familiar with a particular intimate apparel brand were likely to perceive a low level of risk, which would lead to positive and strong attitudes and purchase intentions toward an intimate apparel brand. The present findings indicated the importance of brand familiarity in decreasing perceived risk of intimate apparel brands. Specifically, findings indicated that a familiar intimate apparel brand helped female consumers reduce psychological risk and performance risk and increase positive attitudes and purchase intentions toward the familiar intimate apparel brand. The present findings indicated the importance of brand familiarity in decreasing perceived risk of intimate apparel brands.

Aligned with prior research (e.g., Laroche et al., 1996; Park & Stoel, 2005) that showed prior positive experiences with a brand lowered risk perceptions and enhanced attitudes and purchase intentions. However, our findings showed that brand familiarity had a non-significant direct effect on attitudes toward an intimate apparel brand. Brand familiarity may not have enough impact to lead to positive attitudes toward the intimate apparel brand. Female shoppers may use brand familiarity in reducing the level of risk perception when shopping for intimate apparel products. The lowered risk perception is likely to lead to positive attitudes toward the intimate apparel brand. This suggests a possible indirect effect of brand familiarity on attitudes toward an intimate apparel brand through perceived risk.

The present study found that female consumers’ perceived risk had a significant effect on attitudes and purchase intentions toward an intimate apparel brand. The effect of perceived risk was much stronger than the effect of brand familiarity on purchase intentions toward an intimate apparel brand (perceived risk: $\beta = .72, p \leq .001$; brand familiarity: $\beta = .10, p \leq .001$). These findings imply that a level of risk perception has a stronger impact than brand familiarity on purchase intentions when female consumers buy intimate apparel. Given the significant effect of perceived risk on attitudes and purchase intentions suggests that marketers should focus on alleviating risk perception through consumer experiences with intimate apparel brands. Emphasis on brand information through integrated marketing communication may be crucial for risk reduction strategy in intimate apparel shopping. Brand familiarity could be increased through interactions with consumers in a virtual brand community, which may help consumers feel confidence in intimate apparel shopping. Social media advertising may reduce psychological risks involved with intimate apparel shopping. Marketers should provide service-based strategies using specialists. Such personalized shopping experiences may reduce a level of performance risk by helping customers resolve fit and sizing issues. Additional labeling and hangtags should be considered for product performance information, including easy care, odor resistance and moisture management, which could decrease performance risks in intimate apparel shopping.

Several limitations should be noted in this study. The sample in this study was female consumers in the Mid-south, thus, the results may not represent females in the U.S. population in general. A majority of the sample was Caucasian or European Americans located primarily in the Mid-south; therefore, the results may not characterize women of diverse ethnicities and races or women living in different regions of the country. Future researchers should add
clarification for specific differences perceived by cultures located in various locations with more diverse ethnicities and races. Approximately 62% of the participants indicated they were college students. Thus, the results may not generalize to the U.S. population of women. A future study is needed to explore a more diverse sample with various age ranges and geographic locations.

This study examined the relationships among brand familiarity, perceived risk, attitudes, and purchase intentions in intimate apparel shopping context. The effect of subjective norms on attitudinal and behavioral intentions needs to be explored in future studies on intimate apparel shopping. Future studies need to investigate perceived risk and consumer behaviors related to other branding constructs such as brand image, trust, and loyalty. The use of Victoria’s Secret brand may influence their responses, which limits the generalizability of the findings. Future research could focus on more than one intimate apparel brand, or use a different research design to test a familiar brand compared to an unfamiliar brand of intimate apparel. Specifically, researchers could clarify if a specific brand as financially riskier for consumers than other intimate apparel brands. Furthermore, future research may need to investigate the perceived risk measure encompassing multiple dimensions (i.e. performance risk, psychological risk, financial risk, time/convenience risk, social risk, and physical risk). Additional research might also expand this study to encompass consumers’ satisfaction toward fit and sizing of intimate apparel products and how those may influence risk perceptions and consumer behaviors.

References


Consumer Income and Expenditure Influenced by Business Cycles: A Comparison of Korea and the US

Seo Jeong Kim1, Michael Hann2, Chorong Youn3, and Kyu-Hye Lee1†
1Dept. of Clothing and Textiles, Hanyang University, Korea
2School of Design, University of Leeds, UK
3David F. Miller Center for Retailing Education & Research, University of Florida, USA

Abstract
This research is concerned with comparing fluctuation in the Korean and the US economies in order to ascertain the degree to which the former is influenced by changes in the latter. The aim of this research is to explore business cycles, to examine consumer expenditure in Korea and the US, and to discover the relationships between business fluctuation indexes and overall expenditure. Statistical data from the national statistics of Korea and the US during period from 1990 to 2015 were used. The instrument included a measure of GDP, unemployment rates, GDP deflator rate (inflation rates), and household income and expenditure. For the average annual household expenditures, food, apparel and transportation expenditure data were compared across the two countries. Data were collected separately from different (though comparable) sources and were analyzed using relatively straightforward statistical techniques. It was found that Korean and the US consumers’ income and expenditure were greatly affected by economic fluctuations. Total expenditure and the expenditures for food and transportation were much influenced by business fluctuation in the US, whereas, the expenditures for apparel were much influenced by business fluctuation in Korea.

Keywords: business cycle, business fluctuation index, consumer expenditure, household income

I. Introduction

Most countries experience a different economic condition. It becomes significance, especially, when they face a recession. In order to prevent from confronting any kind of economic depressions, countries must be prepared for future incidents by analyzing their economic histories. Gross Domestic Product (GDP), the market value of goods and services produced by labor and property in the country, regardless of nationality (U.S. Bureau of Economic Analysis, 2010), is the most representative economic indicator for understanding the standard of living. GDP also influences the business cycle and helps to comprehend characteristics and reasons for certain economic situations.
It is essential to understand overall economic conditions by examining business cycles, GDP, income and expenditure within the period from 1990 to 2015 in order to better inform Korean decision makers in their challenge to guide the Korean economy in the future.

Invariably, nations suffer from business fluctuations and the majority face each recession unprepared and with trepidation. The IMF-related incident of late 1997 brought Korean companies into substantial debt and alarmed foreign investors. With cuts in budgets, much unemployment followed across the country. After recovering from the IMF crisis, Korea confronted the recession of 2009, which was of course a global phenomenon affecting other economies worldwide, including the US. Under the prevailing conditions of this global recession, general income and expenditure in both Korea and the US declined severely (as shown in the national statistical data for each nation). The downturn experienced by the US, the world’s largest economy, brought considerable impact across the world. With this in mind, it would appear to be beneficial for Korea to prepare in advance for the next economic crisis rather than sit patiently, unprepared, waiting for it to happen. So it is of importance to ascertain to what degree economic fluctuations in the US may generate fluctuations in the Korean economy. With this perspective in mind, some consideration is given in this study to comparing the dynamics of consumer expenditure in the US and Korea, as well as associated business cycles.

As the world’s economies are intimately connected with each other, overseas financial disturbance may give much more of an impact on the domestic economy compared to even a decade ago. Throughout the years, many researchers stated that opening international trade may affect a trade partner’s business fluctuations (Canova, 1993; Clark, 2001; Frankel, 1998; Gruben, 2002). This may be particularly true of business fluctuation associated with the US which is the leading global economy. Consumer income has a direct influence on consumption and in turn is related to business fluctuations and this may alter the demand for certain products (Lee, 1998). Thus, it is very crucial to understand the flow of overall income and expenditure on economic fluctuations. Changes in expenditure by consumers, in comparison with business fluctuations, would seem to offer a means of understanding the dynamics of consumer expenditure in Korea during the period 1990 to 2015. Since IMF management incident and Global depression of 2008 are discussed as major financial recessions for Koreans, it is meaningful to scrutinize 25 years from 1990 to the latest data including these economic events. The aim of this research is to explore business cycles, to examine consumer expenditure in Korea and the US, and to discover the relationships between business fluctuation indexes and overall expenditure.

II. Literature

1. The Business Cycle

1.1 Definition of the business cycle

For the landmark study of economic time series, most researchers turn to Burns and Mitchell (1946) who defined business cycles as follows:

“Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions,
contractions and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own”

(Burns & Mitchell, 1946, p. 3)

Mankiw, the author of the* Principles of Economics*, defined the business cycle as “… the irregular and largely unpredictable fluctuations in economic activity, as measured by the production of goods and services or the number of people employed” (2007, p. 13). Business cycles are also described as fluctuations in the economy. Economic activities fluctuate by random increase and decrease of economic conditions. When the business cycle is at a peak, economic conditions are most favorable, high employment prevails and, when in a dip or downturn, economic conditions are deteriorating and numbers unemployed increases. As production increases it invariably increases employment and income although it should be noted the effects of technological change and adoption of new forms of processing may lead to a status quo of neither increase nor decrease. On the other hand as production decreases it invariably leads to increased unemployment and lowering of income. Growth of total demand leads that of supply. Yet, an overheating, booming economy may cause rises in prices, and excessive expenditure creates side effects by distorting allocation of resources.

Sometimes the economy goes into a state of ill health. The early stage of a bad economy reduces business sales and profits so sales drop and stocks accumulate. Then firms cut back on production, workers are fired, unemployment increases, personal income drops, and this suppresses consumption ultimately. The period in which the economy is growing at a rate significantly below normal is called a recession or a contraction (Frank & Bernanke, 2007, p. 701). A depression is significantly more severe than a recession economically and may cause political insecurity and even bring serious damage to the society.

Solmon (1980, p. 179) stated that the term “business cycle” is somewhat misleading because it implies regularity in length and frequency, whereas the fluctuations have been erratic in occurrence and varying in size and duration. Some literature may consider economic fluctuations as a regular and predictable pattern; in fact, economic fluctuations display irregularity and they are particularly difficult to use in predicting the future accurately.


1.2 Studies of the business cycle

Milton Friedman is the economist who claimed that it is disturbances, such as abrupt and drastic change in the money supply and bank credit that initiate business cycles (cited by Solmon, 1980, p. 177). Especially in Korea, there was a long-term reduction of household consumption expenditure due to the credit-card event and sharp rise in numbers of people with bad credit in the period between the fourth quarter of 2002 and the second quarter of 2004. A British economist of an earlier period, R. G. Hawtrey also believed that sudden changes in the money supply caused

According to previous researchers, business cycles are caused by random events, such as wars or important political developments. For instance, the Great Depression from 1929 to 1933 had an impact on all the world’s developed economies. The Arab states’ oil embargo in 1973 brought a sharp rise in fuel prices and had extensive ramification across many areas of international economic activity (Solmon, 1980, p. 180); and the effects of the Global Depression of 2008 were felt across the world. Kim and Ahn (2005) studied external shocks, such as the terms of trade and world real interest rate shocks that can affect business cycles in Korea. They focused on the main macroeconomic variables of business cycles in Korea: volatility, persistence, and co-movement with output. According to their result, as Korea becomes more integrated with the world’s financial markets, changes in world interest rates will have significant effects on the Korean economy.

2. Business Fluctuation Index

In order to have a clear understanding of an economy’s dynamics, it is necessary to appreciate the role played by income and expenditure. The status of a nation’s overall economy can be judged by the total income that people in the economy are earning. For example, a person with a high income enjoys higher standards of living while a person with a low income has a lower standard of living. In short, the quality of lives of people are measured largely based on their total income. Mankiw (2007, p. 508), professor of economics at Harvard University, dictated that GDP measures two things at once: the total income of everyone in the economy and the total expenditure on the economy’s output of goods and services.

GDP uses the market prices to compute many different kinds of products into a single measure of the value of economic activity because market prices measure the amount people are willing to pay for different goods and they reflect the value of those goods (Mankiw, 2007, p. 508). For instance, if an apple is twice as expensive as an orange, an apple contributes twice as much to the GDP as an orange. GDP includes both tangible goods, such as automobiles, food, and apparel and intangible services, such as medical care, housecleaning, and haircuts. If one buys his or her favorite designer brand’s clothes which are considered as hard goods, the price of that good is part of GDP. In the same context, if one purchases a ticket to his or her favorite designer’s fashion show, he or she is buying a service, and the ticket fee is also part of GDP.

GDP measures the value of production within the geographic restrictions of a country (Mankiw, 2007, p. 509). The contribution to production of a Chinese citizen working temporarily in Korea is part of Korea’s GDP, not of China’s GDP. Even when a Korean citizen runs a factory in Vietnam, the production is not part of Korea’s GDP but of Vietnam’s GDP. Thus, the GDP of each nation includes only the production made domestically, regardless of the nationality of the produces. Also, GDP measures the economy’s flow of income and expenditure annually or quarterly. These GDP data are always seasonally adjusted to take out the seasonal cycle; for example, the fourth quarter shows a high point of the GDP because holiday shopping including Christmas and New Year are included (Wagner & Mokhatari, 2000).

These aspects of GDP can thus be taken into account in the definition: “Gross domestic product (GDP) is the market value of all final goods and services produced within a country in a given period of time” (Mankiw, 2007, p. 508).
In the past, several pieces of research have used Gross National Product (GNP) in general as a method for understanding the overall economy. Jung and Rhee (1997) used a GNP deflator, widely used in macroeconomics, to calculate the price level from 1965 to 1992. Ji and Rhee (1999) also adopted GNP to analyze the business fluctuations in the period between the first quarter of 1979 and the second quarter of 1998. In Korea, GNP was more extensively used in the past compared to more recently in the twenty-first century, since Korea did not have many active international exchanges. During the first decade of the twenty-first century, the resident population of foreigners in Korea increased and many Koreans left the country to work or live abroad. Thus, GDP is more appropriate as an indicator of business fluctuation due to the freedom of international exchange of capital. Also, according to Slavin (1996, p. 157), the Bureau of Economic Analysis of the US Department of Commerce decided that GDP more accurately measured the nation’s output than did GNP. He stated that GDP offers more advantages than GNP: GDP corresponds more closely than GNP to some important series of economic data, such as employment and industrial production; it is also more useful for making international comparisons, because most other nations use their output in terms of GDP too (Slavin, 1996, p. 157).

Kim and Lee (2004) used quarterly data of real GDP to analyze the influence of social classes’ income and expenditure based on big and small economic fluctuations. Meanwhile Oh (2005) considered structural changes in economic growth and business cycles, using potential growth rates and GDP gap data of Korea.

III. Methodology

1. Data Collection

This research aims to explore business cycles, to examine consumer expenditure in Korea and the US, and to discover the relationships between business fluctuation indexes and overall expenditure. As shown in literature review, real GDP is good index to analyze the relationship between business fluctuation and expenditure. GDP change rate is a good index to trace business cycle (Sichel, 1994). Inflation indexes such as GDP deflator, unemployment rate are also important to understand business fluctuation (Atkeson & Ohanian, 2001; Staiger et al., 1997). Besides, household disposable income is an index to reflect consumers’ experiential business cycle. Therefore we used GDP change rate, real GDP, GDP deflator, unemployment rate and household disposable income for business fluctuation indexes. For consumer expenditure data, we used household expenditure.

For national accounts, data provided by international organizations were used. GDP and other inflation indexes were collected from ‘International Monetary Fund (IMF)’. Data of annual expenditure and income of Korea were collected from the ‘Monthly income and expenditure per urban household’ provided by the Korean Statistical Information Service (KOSIS) of Statistics Korea (KOSTAT). Annual expenditure and income of the US was collected from ‘average annual expenditures and characteristics of all consumer units’ based on consumer expenditure survey provided by U.S. Bureau of Labor Statistics. We collected annual data from 1990 to 2015 which are commonly available to get from both of Korea and the US. The details of the data are presented in Table 1.
Table 1. Data source

<table>
<thead>
<tr>
<th>Data</th>
<th>Note</th>
<th>Unit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Change</td>
<td>Calculated with Gross domestic product (output approach) measured by domestic currency</td>
<td>%</td>
<td>IMF</td>
</tr>
<tr>
<td>GDP Real</td>
<td>Gross Domestic Product, Real</td>
<td>compared to base year(2010: 100)</td>
<td></td>
</tr>
<tr>
<td>GDP Deflator</td>
<td>measure of inflation and is derived by dividing nominal GDP by real GDP</td>
<td>compared to base year(2010: 100); % change, corresponding period previous year</td>
<td></td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>The number of unemployed people as a percentage of the labor force</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Household Disposable Income</td>
<td>The combined incomes of all people sharing a particular household including every form of income (e.g., salaries and wages, retirement income, and investment gains)</td>
<td>Domestic currency</td>
<td>Korean Statistical Information Service (KOSIS) of Statistics Korea (KOSTAT); U.S. Department of Labor, Bureau of Labor Statistics</td>
</tr>
<tr>
<td>Household Expenditure</td>
<td>The amount of final consumption expenditure made by resident households to meet their everyday needs such as food, clothing, housing, energy and transport</td>
<td>Domestic currency</td>
<td></td>
</tr>
</tbody>
</table>

IV. Results

1. Business Cycles of Korea and the US

Based on the Figure 1, it is evident that Korea GDP decreased suddenly around 1998 when the IMF management system episode occurred. In contrast, GDP change of 1999 represent the highest score over the full duration represented by the data in Figure 1. The US GDP did not show any high level of changes during the period from 1997 to 1999 when Korea had a significant fluctuation. However, the US GDP from 2008 to 2009 dropped the most during the period due to the financial crisis that became the great recession in global economy. Another remarkable decline appeared in 2001 when the US had a financial bubble and faced the economic aftermath of the 9/11 terrorist attack. The similarity between Korea and the US GDP change were found after the mid-2000s.

![Figure 1. Korea and the US GDP change year-on year](image)

Figure 1. Korea and the US GDP change year-on year
GDP deflator which is a measure of inflation and unemployment rate show business cycle clearly in Figure 2. Korea’s unemployment rate and changes in GDP deflator increased sharply in 1998 after the IMF management incident. A drastic decrease in GDP deflator in 1999 reflects the Korean recession and high unemployment rates. Due to the global depression in 2009, the US experienced the highest rates of unemployment and lowest GDP deflator in 2009. Within the period from 1990 to 2015 being considered, the IMF management incident of 1999 coincided with the worst recession experienced by Korea and the financial crisis of 2009 coincided with the worst recession experienced by the US. From this figure, it can be seen that each nation shows different economic fluctuations and thus different business cycles and an irregular pattern rather than a repeated pattern is evident. In effect, it is not apparently possible with confidence to predict future business cycles or recessions, but it is possible to be prepared to handle the next recession based on the experience and perception as well as knowledge of prior recessions.

![Figure 2, Inflation rate (GDP deflator% change) and unemployment rate of Korea and the US](image)

2. Income and Expenditure of Korea and the US

Expenditure as a proportion of the total income was examined based on the household data (Figure 3). In Korea, at the end of 1998, after the IMF management system incident, expenditure inclined sharply compared to total income, contrary to expectations. We expected that after 1998, expenditure to income would decline sharply. We can find the reason of this incline in the decline of disposal income in 1999. As seen in Table 2, expenditure in 1999 was declined by 7% compared to that of 1997, however income in 1999 was declined by 17% compared to that of 1997. That is the reason why rates of expenditure to income show the highest numbers during recession in the early 2000s. It took 7 years for total income to catch up that in 1997 when the income was highest before the IMF management system incident.

As shown in Figure 3, US’s expenditure to income gradually decreased as years went by until 2010. Although economic and political influences initiated the rise in income, consumers didn’t increase their expenditure as much as income increase. Compare to the case of Korea, expenditure and income were recovered quickly after global financial crisis in 2009. Income in 2009 declined by 2% compared to that of 2008. But in 2011, income turned to incline again and caught up the amount of income in 2008 when the annual income was highest before the financial crisis.
Figure 3. Annual expenditure to annual disposable income

Table 2. Average annual household expenditures of Korea

(Unit: won)

<table>
<thead>
<tr>
<th>Year</th>
<th>Disposal income</th>
<th>Expenditure</th>
<th>Expenditure /Income</th>
<th>Food at home</th>
<th>Apparel</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1,777,382</td>
<td>1,354,032</td>
<td>76%</td>
<td>433,440</td>
<td>102,850</td>
<td>149,743</td>
</tr>
<tr>
<td>1991</td>
<td>2,007,076</td>
<td>1,476,784</td>
<td>74%</td>
<td>453,521</td>
<td>113,715</td>
<td>166,520</td>
</tr>
<tr>
<td>1992</td>
<td>2,184,626</td>
<td>1,597,652</td>
<td>73%</td>
<td>465,416</td>
<td>121,095</td>
<td>180,838</td>
</tr>
<tr>
<td>1993</td>
<td>2,253,216</td>
<td>1,653,708</td>
<td>73%</td>
<td>458,665</td>
<td>121,540</td>
<td>203,197</td>
</tr>
<tr>
<td>1994</td>
<td>2,425,971</td>
<td>1,751,593</td>
<td>72%</td>
<td>457,565</td>
<td>132,897</td>
<td>235,038</td>
</tr>
<tr>
<td>1995</td>
<td>2,622,333</td>
<td>1,869,417</td>
<td>71%</td>
<td>458,960</td>
<td>149,160</td>
<td>257,181</td>
</tr>
<tr>
<td>1996</td>
<td>2,802,691</td>
<td>2,009,727</td>
<td>72%</td>
<td>482,097</td>
<td>159,058</td>
<td>275,823</td>
</tr>
<tr>
<td>1997</td>
<td>2,820,418</td>
<td>2,016,935</td>
<td>72%</td>
<td>463,839</td>
<td>147,065</td>
<td>278,638</td>
</tr>
<tr>
<td>1998</td>
<td>2,284,074</td>
<td>1,659,515</td>
<td>73%</td>
<td>378,136</td>
<td>102,338</td>
<td>207,315</td>
</tr>
<tr>
<td>1999</td>
<td>2,328,112</td>
<td>1,866,520</td>
<td>80%</td>
<td>392,890</td>
<td>115,997</td>
<td>247,197</td>
</tr>
<tr>
<td>2000</td>
<td>2,519,076</td>
<td>2,029,838</td>
<td>81%</td>
<td>395,541</td>
<td>130,533</td>
<td>263,099</td>
</tr>
<tr>
<td>2001</td>
<td>2,644,976</td>
<td>2,103,700</td>
<td>80%</td>
<td>379,241</td>
<td>135,761</td>
<td>261,917</td>
</tr>
<tr>
<td>2002</td>
<td>2,766,804</td>
<td>2,135,773</td>
<td>77%</td>
<td>369,809</td>
<td>137,984</td>
<td>272,613</td>
</tr>
<tr>
<td>2003</td>
<td>2,783,872</td>
<td>2,171,240</td>
<td>78%</td>
<td>357,629</td>
<td>139,796</td>
<td>263,160</td>
</tr>
<tr>
<td>2004</td>
<td>2,835,740</td>
<td>2,205,306</td>
<td>78%</td>
<td>349,327</td>
<td>138,136</td>
<td>268,042</td>
</tr>
<tr>
<td>2005</td>
<td>2,862,786</td>
<td>2,235,458</td>
<td>78%</td>
<td>342,741</td>
<td>144,148</td>
<td>273,119</td>
</tr>
<tr>
<td>2006</td>
<td>2,921,979</td>
<td>2,268,024</td>
<td>78%</td>
<td>344,532</td>
<td>145,616</td>
<td>280,117</td>
</tr>
<tr>
<td>2007</td>
<td>2,991,279</td>
<td>2,295,175</td>
<td>77%</td>
<td>339,294</td>
<td>147,687</td>
<td>278,728</td>
</tr>
<tr>
<td>2008</td>
<td>3,031,955</td>
<td>2,305,908</td>
<td>76%</td>
<td>348,681</td>
<td>147,710</td>
<td>269,210</td>
</tr>
<tr>
<td>2009</td>
<td>2,917,058</td>
<td>2,244,309</td>
<td>77%</td>
<td>320,730</td>
<td>137,952</td>
<td>278,620</td>
</tr>
<tr>
<td>2010</td>
<td>2,983,795</td>
<td>2,312,540</td>
<td>78%</td>
<td>319,704</td>
<td>148,221</td>
<td>268,660</td>
</tr>
<tr>
<td>2011</td>
<td>3,037,069</td>
<td>2,311,788</td>
<td>76%</td>
<td>315,520</td>
<td>153,742</td>
<td>265,125</td>
</tr>
<tr>
<td>2012</td>
<td>3,154,581</td>
<td>2,338,394</td>
<td>74%</td>
<td>312,423</td>
<td>155,774</td>
<td>270,358</td>
</tr>
<tr>
<td>2013</td>
<td>3,167,998</td>
<td>2,328,419</td>
<td>73%</td>
<td>309,134</td>
<td>153,875</td>
<td>278,961</td>
</tr>
<tr>
<td>2014</td>
<td>3,230,432</td>
<td>2,354,087</td>
<td>73%</td>
<td>309,472</td>
<td>146,757</td>
<td>306,525</td>
</tr>
<tr>
<td>2015</td>
<td>3,260,795</td>
<td>2,347,126</td>
<td>72%</td>
<td>306,442</td>
<td>138,792</td>
<td>318,676</td>
</tr>
</tbody>
</table>
Table 3. Average annual household expenditures of the US (Unit: US dollar)

<table>
<thead>
<tr>
<th>Year</th>
<th>Disposal income</th>
<th>Expenditure</th>
<th>Expenditure /Income</th>
<th>Food</th>
<th>Food at home</th>
<th>Apparel</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>28,937</td>
<td>28,381</td>
<td>98%</td>
<td>4,296</td>
<td>2,485</td>
<td>1,618</td>
<td>5,120</td>
</tr>
<tr>
<td>1991</td>
<td>30,729</td>
<td>29,614</td>
<td>96%</td>
<td>4,271</td>
<td>2,651</td>
<td>1,735</td>
<td>5,151</td>
</tr>
<tr>
<td>1992</td>
<td>30,786</td>
<td>29,846</td>
<td>97%</td>
<td>4,273</td>
<td>2,643</td>
<td>1,710</td>
<td>5,228</td>
</tr>
<tr>
<td>1993</td>
<td>31,890</td>
<td>30,692</td>
<td>96%</td>
<td>4,399</td>
<td>2,735</td>
<td>1,676</td>
<td>5,453</td>
</tr>
<tr>
<td>1994</td>
<td>33,098</td>
<td>31,731</td>
<td>96%</td>
<td>4,411</td>
<td>2,712</td>
<td>1,644</td>
<td>6,044</td>
</tr>
<tr>
<td>1995</td>
<td>33,864</td>
<td>32,264</td>
<td>95%</td>
<td>4,505</td>
<td>2,803</td>
<td>1,704</td>
<td>6,014</td>
</tr>
<tr>
<td>1996</td>
<td>34,864</td>
<td>33,797</td>
<td>97%</td>
<td>4,698</td>
<td>2,876</td>
<td>1,752</td>
<td>6,382</td>
</tr>
<tr>
<td>1997</td>
<td>36,684</td>
<td>34,819</td>
<td>95%</td>
<td>4,801</td>
<td>2,880</td>
<td>1,729</td>
<td>6,457</td>
</tr>
<tr>
<td>1998</td>
<td>38,358</td>
<td>35,535</td>
<td>93%</td>
<td>4,810</td>
<td>2,780</td>
<td>1,674</td>
<td>6,616</td>
</tr>
<tr>
<td>1999</td>
<td>40,652</td>
<td>36,995</td>
<td>91%</td>
<td>5,031</td>
<td>2,915</td>
<td>1,743</td>
<td>7,011</td>
</tr>
<tr>
<td>2000</td>
<td>41,532</td>
<td>38,045</td>
<td>92%</td>
<td>5,158</td>
<td>3,021</td>
<td>1,856</td>
<td>7,417</td>
</tr>
<tr>
<td>2001</td>
<td>44,587</td>
<td>39,518</td>
<td>89%</td>
<td>5,321</td>
<td>3,086</td>
<td>1,743</td>
<td>7,633</td>
</tr>
<tr>
<td>2002</td>
<td>46,934</td>
<td>40,677</td>
<td>87%</td>
<td>5,375</td>
<td>3,099</td>
<td>1,749</td>
<td>7,759</td>
</tr>
<tr>
<td>2003</td>
<td>48,596</td>
<td>40,817</td>
<td>84%</td>
<td>5,340</td>
<td>3,129</td>
<td>1,640</td>
<td>7,781</td>
</tr>
<tr>
<td>2004</td>
<td>52,287</td>
<td>43,395</td>
<td>83%</td>
<td>5,781</td>
<td>3,347</td>
<td>1,816</td>
<td>7,801</td>
</tr>
<tr>
<td>2005</td>
<td>56,304</td>
<td>46,409</td>
<td>82%</td>
<td>5,931</td>
<td>3,297</td>
<td>1,886</td>
<td>8,344</td>
</tr>
<tr>
<td>2006</td>
<td>58,101</td>
<td>48,400</td>
<td>83%</td>
<td>6,111</td>
<td>3,417</td>
<td>1,874</td>
<td>8,508</td>
</tr>
<tr>
<td>2007</td>
<td>60,858</td>
<td>49,638</td>
<td>82%</td>
<td>6,133</td>
<td>3,465</td>
<td>1,881</td>
<td>8,758</td>
</tr>
<tr>
<td>2008</td>
<td>61,774</td>
<td>50,486</td>
<td>82%</td>
<td>6,443</td>
<td>3,744</td>
<td>1,801</td>
<td>8,604</td>
</tr>
<tr>
<td>2009</td>
<td>60,753</td>
<td>49,067</td>
<td>81%</td>
<td>6,372</td>
<td>3,753</td>
<td>1,725</td>
<td>7,658</td>
</tr>
<tr>
<td>2010</td>
<td>60,712</td>
<td>48,109</td>
<td>79%</td>
<td>6,129</td>
<td>3,624</td>
<td>1,700</td>
<td>7,677</td>
</tr>
<tr>
<td>2011</td>
<td>61,673</td>
<td>49,705</td>
<td>81%</td>
<td>6,458</td>
<td>3,838</td>
<td>1,740</td>
<td>8,293</td>
</tr>
<tr>
<td>2012</td>
<td>63,370</td>
<td>51,442</td>
<td>81%</td>
<td>6,599</td>
<td>3,921</td>
<td>1,736</td>
<td>8,998</td>
</tr>
<tr>
<td>2013</td>
<td>56,352</td>
<td>51,100</td>
<td>91%</td>
<td>6,602</td>
<td>3,977</td>
<td>1,604</td>
<td>9,004</td>
</tr>
<tr>
<td>2014</td>
<td>58,364</td>
<td>53,495</td>
<td>92%</td>
<td>6,759</td>
<td>3,970</td>
<td>1,786</td>
<td>9,073</td>
</tr>
<tr>
<td>2015</td>
<td>60,448</td>
<td>55,978</td>
<td>93%</td>
<td>7,023</td>
<td>4,015</td>
<td>1,846</td>
<td>9,503</td>
</tr>
</tbody>
</table>

To identify relationships between business fluctuations and expenditure, bivariate correlation analysis using Pearson correlation coefficients was conducted. Table 4 shows the results of correlation analysis. As shown in Table 4, in Korea, the correlations of total expenditure and business fluctuation indexes including GDP real, consumer price and expenditure were very high ($r > .92$). However, interestingly, the correlations between business fluctuation indexes and the expenditure for food at home were negative. We expected that the negative relationship came from the incline of dining out. We also expected that correlation coefficient would be positive, if expenditure for dining out was included. Korean Statistical Information Service (KOSIS) provided only the expenditure for food at home and sum of the expenditure for dining out and accommodation. However, the expenditure for apparel and transportation had positive relationships with business fluctuation indexes such as real GDP, GDP deflator and disposal income.
Compare to total expenditure and the expenditure for transportation, the expenditure for apparel was less influenced by business fluctuation.

Table 4. Correlation coefficient (Pearson $r^2$) between business fluctuation indexes and expenditure of Korea

<table>
<thead>
<tr>
<th></th>
<th>Real GDP</th>
<th>GDP deflator</th>
<th>Unemployment rate</th>
<th>Disposal income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure</td>
<td>.925***</td>
<td>.920***</td>
<td>.107 (n.s.)</td>
<td>.967***</td>
</tr>
<tr>
<td>Food at home</td>
<td>-.926***</td>
<td>-.935***</td>
<td>-.387 (n.s.)</td>
<td>-.735***</td>
</tr>
<tr>
<td>Apparel</td>
<td>.655***</td>
<td>.631**</td>
<td>-.361 (n.s.)</td>
<td>.861***</td>
</tr>
<tr>
<td>Transportation</td>
<td>.793***</td>
<td>.789***</td>
<td>.108 (n.s.)</td>
<td>.927***</td>
</tr>
</tbody>
</table>

As shown in Table 5, in the US, the correlations of total expenditure and business fluctuation indexes including GDP real, consumer price and expenditure were very high as well as Korea ($r > .97$). Unlike the case of Korea, the correlations between business fluctuation indexes and expenditure for food at home were positive as well as expenditure for total food including both of food at home and dining out. Considering that expenditure for food at home become to decline according to the increase of GDP after 2000s, these results are very interesting.

The expenditure for apparel and transportation had also positive relationships with business fluctuation indexes such as real GDP, GDP deflator and disposal income. Expenditure for transportation includes public transportation costs such as fares for buses, subways, taxis, rail, and air transportation and personal transportation costs including costs for vehicle purchase, fuel, and repair. Considering that price change of fuel have strong influence on expenditure for transportation (Kim & Chun, 2009), the results that the correlation coefficients are lower than these in the US indicate that fuel price in Korea has been less affected by business cycle than in the US. That means price change of fuel in Korea is less sensitive than that in the US. Compare to total expenditure, expenditures for food and transportation were influenced by business fluctuation as much as total expenditure. However, the expenditure for apparel was much less influenced by business fluctuation.

Table 5. Correlation coefficient (Pearson $r^2$) between business fluctuation indexes and expenditure of the US

<table>
<thead>
<tr>
<th></th>
<th>Real GDP</th>
<th>GDP deflator</th>
<th>Unemployment rate</th>
<th>Disposal income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure</td>
<td>.983***</td>
<td>.989***</td>
<td>.238 (n.s.)</td>
<td>.977***</td>
</tr>
<tr>
<td>Food</td>
<td>.983***</td>
<td>.983***</td>
<td>.270 (n.s.)</td>
<td>.970***</td>
</tr>
<tr>
<td>Food at home</td>
<td>.953***</td>
<td>.990***</td>
<td>.381 (n.s.)</td>
<td>.942***</td>
</tr>
<tr>
<td>Apparel</td>
<td>.455*</td>
<td>.035 (n.s.)</td>
<td>-.394*</td>
<td>.455*</td>
</tr>
<tr>
<td>Transportation</td>
<td>.980***</td>
<td>.944***</td>
<td>.033 (n.s.)</td>
<td>.929***</td>
</tr>
</tbody>
</table>
By comparing two different countries, we found that total expenditure and the expenditures for food and transportation were much influenced by business fluctuation in the US. On the contrary, the expenditures for apparel were much influenced by business fluctuation in Korea. In the US, the ratio of the expenditure for apparel to total expenditure declined constantly from 5.7% in 1990 to 3.3% in 2015. In Korea, the ratio of the expenditure for apparel to total expenditure fluctuated according to business cycles. In 1995, the ratio was highest (8.0%), in 1998 and 1999 when the IMF management system incident occurred, the ratio was low (6.2%), and the ratio became low again (6.1%) in 2008 when global financial crisis occurred.

V. Summary and Conclusions

Examination of the business cycles of Korea and the US helped to develop an understanding of their relative financial difficulties. Especially, applying exchange rate variations to compare income and expenditure in the Korean and the US context, provided a broader perspective of Korea’s economy. Thus, data or figures interpreted in the US context offered an objective basis on which to analyze Korea’s economy.

Not surprisingly it was found that Korean and the US consumers’ income and expenditure, during the period from 1990 to 2015, were greatly affected by economic fluctuations, as were GDP, unemployment rates and inflation. All in all it is felt that the comparison between the two economies and consumer expenditure in each, was valid during the global crisis (2008), but not valid during other fluctuating times. Further to this, it would appear to be the case that the two economies are substantially different in terms of the factors influencing each economy. It must be recognized also that a vast range of inter-related factors influence GDP and thus there is the danger in analysis to assume that particular changes have been influenced by certain factors when, in reality, other ignored factors may have played a contribution also. So it must be concluded that, in terms of global difficulties, economic fluctuations can indeed be seen to affect both the US and Korea simultaneously, but it appears that this would be the case with all developed economies worldwide due to the economic inter-relationships operating globally. With respect to GDP fluctuations of a non-global nature, occurring in each economy, it was found that no real correlation was apparent from the data considered.

This study focused on the changes in consumers’ general income and consumption during the period from 1990 to 2015, comparing Korea and the US. Past researchers studied similar issues but they mostly focused on periods before and after the IMF management system episode. Following the global financial crisis of 2008, much research has been directed to explaining the conditions surrounding this crisis.

In order to recognize overall business fluctuations in Korea and the US, GDP data were mainly used for this study. However, there certainly are more influential factors, such as political, cultural, and socio-demographical factors to measure business cycles rather than GDP data. In order to more fully understand business cycles, in addition to considering statistical data, further political and social factors should be incorporated into any future worthwhile analysis. Despite the importance of exchange rates, there were still limitations to consider. Thus, it would be useful to adopt the purchasing power parities (PPPs) to convert statistics such as income and expenditure in terms of its national currency units for future research. In that way, not only Korea’s general income and expenditure can be compared, but also the income and expenditure of other nations.
Often industries and component companies, when confronted by sudden economic crisis, are damaged severely due to the lack of preparedness and with no real knowledge of the dynamics of the situation. Companies, industries and economies in general need to be able to read the signs in advance if possible and, most importantly, need to be able to adjust their strategy in order to avoid a future disastrous outcome following recession. For example, since two countries have different results on apparel expenditure for the same period, this study suggests that apparel industries, focusing mainly on exporting or importing, should be flexible in responding for each country’s business crisis. One thing is certain (it seems) and that is every financial boom is followed by a financial slump.

References


Identity Formation and Self-Reflection Strategies in the Development of Apparel Design ePortfolios

Christin Seifert† and Veena Chattaraman
Dept. of Consumer and Design Sciences, Auburn University, USA

Abstract

Visual literacy, a key element of a design portfolio, is achieved by communicating a consistent visual aesthetic with respect to design elements, design principles and individual style. Yet, students often feel challenged in articulating their personal aesthetic or design philosophy in order to create a unifying design identity within a body of artifacts. This paper shares some best practices on overcoming this challenge through students’ engagement in self-reflection and identity formation processes. The implemented innovative strategy in a senior-level portfolio development course for apparel designers involved four different phases: 1) one-on-one meetings to self-reflect on previous design work, 2) selection and revision of artifacts, 3) peer-review and critiques of revised portfolio artifacts, and 4) development of a final ePortfolio to showcase a unified design identity. It was evident that recording students’ initial self-reflection in the form of a metacognitive oral report encouraged and motivated identity development in their portfolio. Further, students expressed their satisfaction in the ability to participate in the selection process of artifacts by self-reflecting about what they wanted to highlight about themselves and why. Overall, student outcomes from this strategy exceeded expectations and the portfolios developed were successful in creating a cohesive design identity.

Keywords: apparel design, identity, portfolio, self-reflection

I. Introduction

The design industry is becoming increasingly competitive, especially for entry-level positions. When fashion design students graduate from college and start looking for a job, they have to prove that they possess the ability to perform the job at a satisfactory level. The most compelling tool to impress potential employers and to differentiate from competing graduates–is a professional Portfolio. An apparel design portfolio is a purposeful collection of artifacts and serves as a communication tool that reflects a comprehensive skill set including visual, technical, and analytical skills. It is a portrayal of the designer’s creativity and expression of personality that exhibits the
development of work and ideas, while simultaneously conveying the designer’s personal aesthetic and style (Tain, 2010). As technology permeates through every facet of our lives, many companies now require a link to an electronic Portfolio (ePortfolio) when filling out an online application on the company’s career portal. According to Workfolio, an innovative leader in professional visibility applications, “56% of all hiring managers are more impressed by a candidate’s personal website than any other personal branding tool -however, only 7% of job seekers actually have a personal website” as reported in a Forbes magazine (Smith, 2013). Therefore, the senior-level portfolio development course for apparel designers is fundamental in preparing students for future professional careers and bridging the gap for design disciplines in the digital age.

In order for students to successfully market themselves to a professional audience, visual literacy is a key element of a portfolio which is achieved by communicating a consistent and strong visual brand aesthetic with respect to design elements (typeface, color etc.), design principles (complexity, novelty, unity etc.) and individual style. Yet, students often feel challenged in articulating their personal aesthetic or design philosophy in order to create a holistic pattern of artifacts and a unifying design identity for their portfolio. This paper shares an innovative strategy on overcoming this challenge through student’s engagement in self-reflection and identity formation processes.

II. Background

1. Purpose of a Portfolio

Current literature points to three types of ePortfolios: learning, assessment, and professional showcase (e.g., Barrett, 2010; Matthews-Denatale, 2014). The learning portfolio, also known as the process or development portfolio, focuses on capturing the learning involved in creating a portfolio (Aalderink, 2007). It engages students to develop skills to gauge their own learning and create connections between different educational environments, whereas, the assessment portfolio is geared towards an end-evaluation of student work (Aalderink, 2007). According to Aalderink (2007), assessment portfolios are less preferred by both students and teachers since they do not attain the holistic goals of ePortfolios and evaluate students’ skills and competencies in specific areas, which are determined by program standards or outcomes (Balaban, Divjak, & Kopic, 2010). On the other hand, the professional portfolio holistically displays the best artifacts of a student’s collection in a logical and professional manner to appeal to a particular employer. A fashion design Portfolio created with the intent of seeking entry-level design positions can be viewed as a professional showcase, which demonstrates a relevant set of skills, and a variety of educational and professional experiences expressed through unique visual and narrative artifacts. The word artifact is used to describe all text-based work, designs, and videos or other digital media, such as blogs which a student uses to articulate a sense of self (Bryan & Chittum, 2013). Professional portfolios are never static, but rather reflect an on-going process that promotes new acquired skills and industry experience.

2. The Fashion Design Portfolio

A traditional fashion portfolio incorporates four to six design concepts that each include the following components: 1) Mood/Theme/Concept boards, 2) Fabric/Color board, 3) Figure Design Spreads, and 4) Flats/Specs. A design portfolio acts as a conversation piece that tells a story through the showcase of a chronological design process with
respect to how the designer transforms his/her idea to arrive at the final artifact (“Hire me!? The portfolio handbook,” n.d.). Tain (2010) points out that each design story starts with the concept board, which includes dramatic and significant photographic images to communicate a design theme along with a short written description and a coordinated color story. Fabric/color swatches are often included in a mood theme board but can be separate. The fabric/color board aids in conveying trim design, colorways, original textile designs, recolored prints, and garment details that will be incorporated into the final collection (Tain, 2010). The board displaying the figure design spreads serves as a selling tool since it visualizes a designer’s idea, displays design coordination within a collection, and communicates the proportion and look of each design (Tain, 2010). The figure design spread follows the flats/specs board with technical front and back drawings and sample spec sheets along with accurate measurements to communicate important technical skills (Tain, 2010).

While incorporating the design concepts into the fashion portfolio, the designer should never lose sight of the portfolio’s focus by targeting a consistent target market and price point (Tain, 2010). To achieve a unified body of work, the designer needs to objectively edit out irrelevant pieces that take away from the focus of the portfolio since “the mark of a professional portfolio is its focus” (Tain, 2010, p.31). Developing the design portfolio to align with a specific target market, while maintaining a consistent design style from the first to the last piece, ensures a greater chance of landing the dream job.

3. Design Identity Challenge

The objective of the portfolio course is to develop a design portfolio in print, PDF, web, and mobile formats that reflect a focused range of skills, and convey fashion ideas through an individual style which is mirrored in design communication, logo, layout, and presentation. Only the very best work goes into the fashion design portfolio. Most of the time the design student has to rework and edit pieces or make adjustments to his or her design concepts in order to meet professional standards. This process requires critical thinking, self-reflection and being aware of one’s own identity and design philosophy. However, as observed in previous portfolio development classes for apparel designers, students do not know how to articulate their identity as a fashion designer, what target market they want to design for, and what their design philosophy is prior to enrolling for this course. This insight is imperative since creative design bases its success on the ability of the designer to differentiate oneself from other designers through infusing their own perspectives, experiences, culture, and personality into their final work. Thus, the lack of a clearly articulated design identity and focus challenges students during the editing and reworking processes of their work toward a cohesive final portfolio. In this paper, we propose some best practices on overcoming this challenge through students’ engagement in self-reflection and identity formation processes, which provide a critical starting point to the portfolio development process. Once students’ cognitive processes are stimulated and their design identity is articulated, they are then able to achieve each of the course objectives successfully.

4. Identity and Self-Reflection

The fashion design portfolio can be grounded in a multitude of self-reflection processes, which can create a gateway for the evolution of a collection or design identity (Keane, 2014). Various authors (Jenson, 2011; Nguyen, 2013) have highlighted the interrelated roles of identity and self-reflection within an ePortfolio. Personal identity formation is “a self-reflective process of turning thought inward to analyze and reflect on intrapersonal views, values,
and convictions” (Berzonsky & Barclay, 1981, p. 207). Nguyen (2013) emphasizes that identity is crucial for analyzing ePortfolios since they become a “living portal” and provide a means to uncover previously unknown perceptions of self, and allow for modifying the past and imagining one’s future (p. 143). Jenson (2011) points out that students’ self-reflection is an important aspect of reviewing their own work and modifying it.

Wang (2009) defines reflection in ePortfolios as “a thinking process more than simple memorization and comprehension, and involves a variety of cognitive processes, such as summarization, identifying general principles, exploring various situations, reconciling options, monitoring progress, and so on” (p. 422). Eynon, Gambino, and Török, (2014) argue that when proper reflective pedagogy is implemented in the ePortfolio process, it becomes more than a standard technology by beginning to display engaging connections, integrative academic learning, life experiences, and a process of personal growth. Reflection, in turn, becomes an intriguing aspect of ePortfolio development in design disciplines.

Exploring identity also provides design students with a platform for personal branding. Aruda (2003) points out that personal branding is a tool for creative professionals to distinguish themselves from their competitors in the same field, and the best personal brand strategy is to be authentic and true to oneself. The ePortfolio process can, in turn, be seen as a medium to share one’s own story and identity (Delacruz & Bales 2010). Thus, analyzing one’s intrinsic design aesthetic through reflection enhances students’ ability to form a personal brand, which then influences their professional identity. One of the strengths of the ePortfolio is its ability to allow the student designer to identify, develop, and articulate the common themes coursing through their artifacts and experience as an emerging designer (Graves & Epstein, 2011).

There are two established models of reflection which are categorized as either the procedural or dominant model. Procedural models typically follow four basic stages of reflection: experience, analyzing the situation and learned outcomes, and subsequently using this learning experience for use in the future (Wang, 2009). The dominant model, on the other hand, promotes instructor-led pedagogy to guide teaching and self-reflection (Wang, 2009). Brammer (2011) supports this dominant model by suggesting that students struggle with forming a critical reflection of their work, hence, the process should be aided by a structured pedagogy enhancing the reflective process. In addition, Keane (2014) found that students do not always fully reflect on their artifacts or have the capacity to reflect on their own, thus without an instructor questioning their choices the student may never reflect on why the artifacts were originally included. Identity and self-reflection strategies that implement the dominant model, hence, provide the valuable rationale for the analysis and selection of artifacts to be included in the design Portfolio, and what these mean for shaping the designer’s personal brand.

III. Methodology

1. E-portfolio Development Phases

The innovative strategy in the portfolio development course for apparel designers involved four different phases. As part of the first phase, related to discovery and expression of design identity, students reflected on the following questions in a narrative form in the first class of this course: Who am I as a designer? What defines me? Where do I get my inspiration from? What are the unique aspects of my work? Additionally, they were asked to reflect on their
preferred price point and target consumer, so that the design portfolio aligns with a specific target market and demonstrates clear intent. This is important since most companies are interested in seeing the same apparel category in the portfolios that they specialize in for their business. The students then collected all relevant existing design artifacts, which were outcomes of various design courses taken during their apparel design program. Through one-on-one meetings, the instructor and students viewed their body of produced artifacts holistically and compared it to their narrative descriptions from the first class. This process enabled students to identify the underlying connections and common themes across the body of artifacts. This effort also resulted in observing visual similarities related to design principles (e.g. contrast, complexity, rhythm) and elements (e.g. colors, line, shape, texture) in the final design outcomes, which allowed students to tease out the underlying design elements and principles that they could apply in their personal branding. The interaction with the instructor and engagement in these cognitive process enabled students to cultivate self-awareness and left many students with an “aha moment”. For example, one student realized that all of her portfolio artifacts reflect a common theme related to the rich history of the American South and that her collections possess a high level of design complexity due to incorporated floral prints, ruffles, lace, and beading that are inspired from Antebellum heirlooms. Following this realization, she consciously applied these design elements in her portfolio branding.

Following the first phases of the design identity formation and self-reflection, students participated in carefully selecting the artifacts that best exemplify what defines and characterizes them as an apparel designer. This selection process helped students identify which artifacts required: a) screening out, b) slight revisions, and c) considerable reworking; as well as, what additional design concepts were needed to fill gaps and strengthen the portfolio focus. Based on this selection process, students revised their artifacts to create a focused design identity in their work and consistent personal branding communicated through their logo and other elements of personal style, such as layout, background, color, and typeface.

The third phase involved a peer-review and critique of students’ revised portfolio artifacts and their constructed design identity. Student peers were encouraged to provide constructive, objective and analytic feedback of each others work. For example, students provided feedback on the arrangement of images, font size and readability, logo placement, color palette, consistency of design style and target market, and overall flow of the artifacts. They also provided valuable recommendations on which designers would be a good fit for the constructed design identity in each portfolio. The use of a peer audience helped students to develop professional attitudes and fostered a healthy environment of self- and peer-evaluation. Overall, this phase validated the intent the student desired to communicate and ensured collective growth for the entire portfolio development class. After the constructive feedback, the students further revised and strengthened their artifacts to achieve effective communication in their design aesthetic and visual identity.

In the fourth and final phase of their portfolio development, students developed their ePortfolio including an introductory page to their portfolio website with a personal brand identity, a professional summary highlighting their statement of design philosophy, career goals, accomplishments, a resume, as well as their visual design artifacts. In addition to visual artifacts, students also provided relevant professionally focused written descriptions to contextualize each artifact for an industry audience. The written statements enabled students to express their inspiration and purpose of each artifact in a narrative manner and aided in tying their design artifacts together to create a cohesive story.
The Portfolio, in web and mobile formats, was developed by using the website builder Adobe® Muse, a dedicated design software that does not require code writing. Adobe® Muse was the chosen ePortfolio platform as it is more effective in integrating stylized imagery, typography, and other graphic elements in creating a distinct identity, in comparison to other platforms that offer free templates for building websites. ePortfolios created on Adobe® Muse can also be shared effectively on mobile devices through the design of mobile (tablet and smartphone) versions of the ePortfolio.

2. An ePortfolio Illustration

Figures 1 and 2 showcase the artifacts of an Apparel design student who was enrolled in the course. After completing the four phases of self-reflection and identity formation processes, the student successfully identified her personal aesthetic as “dark and mysterious with luxurious garments inspired from art, music and literature.” The underlying commonality lies in themes that focus on Couture evening collections featuring unconventional and innovative silhouettes. In order to create a cohesive visual identity across artifacts, the student included her logo on each page as a unifying personal branding element. The student achieved consistent layouts within and across design concepts through a similar presentation and arrangement of photographs and figure design spreads as well as through

Figure 1. A portfolio artifact including concept board, process board, and figure design spread
a uniform use of negative space. She created immediate visual unity by using a specific palette of colors, while employing a constant white background for all the artifacts. Another personal branding element, the typeface, reflects the consistent use of a distinguished font for the title and a complimenting easy-to-read font for the written descriptions.

IV. Discussion and Conclusion

The four phases of the innovative strategy related to self-reflection and identity formation, coupled with structured pedagogy, enabled apparel design students to a) develop metacognitive skills and critical thinking, b) to articulate their personal aesthetic and design philosophy, and c) to create a cohesive design identity within a body of artifacts. It was evident that recording students’ self-reflection in the form of a metacognitive oral report encouraged and motivated their identity development in their portfolio. Learning to critically and objectively analyze and contemplate on their own work was significant for the students during their senior year prior to the start of their professional careers as fashion designers. Our observation during the one-on-one meetings confirm Brammer (2011) and Keane’s (2014) argument that the process of a student’s self-reflection can only be initiated with the guidance of an intentional and consistent instructor led pedagogy. We found that if the instructor did not ask relevant and thought-provoking questions to trigger the self-reflection and identity formation processes, the design students would have limited success in this first phase.

Further, students expressed their satisfaction in the ability to participate in the selection process of artifacts by self-reflecting about what they want to showcase about themselves and more importantly, why. It was important for
students to feel that they had control over the selection of their artifacts and experienced a sense of accomplishment when deciding what design pieces should be included. Many students felt relieved after the selection phase since they were initially uncertain about the appropriateness of their artifacts prior to formulating a cohesive design identity. Commitment to their selected artifacts was the first step towards creating a successful portfolio showcasing their unique design identity.

Observations during the peer review phase revealed that constructive criticism was a cornerstone to effectively fortify the creative process. This phase also helped students to strengthen their communication skills through continuous inquiry to articulate ideas and thought processes (Carpenter, Apostel, & Hyndman, 2012). Offering feedback was an essential tool for learning and allowed students to develop the skills necessary to effectively reflect on their own work (Keane, 2014; Stevenson, 2006). Subsequently, this pedagogical strategy gave students the opportunity to reach an even deeper level of reflection. It aided in teaching young designers the value of accepting objective criticism and realizing that it is necessary to grow, so that their skills can mature.

In the fourth phase of the strategy, our experience confirmed that the use of an open web space ePortfolio system, such as Adobe® Muse, gave design students more freedom to communicate and express in a way that most symbolizes their true self, thus resulting in the intensification of the reflection process (Johnson, Hsieh, & Kidwai, 2007). The free display of artifacts allows for a sense of ownership of the space to take place, which Barret (2004) describes as motivation for meaningful learning. By allowing students to explore their own work, ePortfolios foster engagement with technology and promote the emergence of the student’s identity. Subsequently, the analysis of identity provides students with a platform to investigate and continue learning through reflection (Rowley & Bennett, 2013).

Overall, student outcomes from this class exceeded expectations and several students’ Print and ePortfolios are being used to promote the apparel design department at various events. Students have repeatedly let us know that they are able to distinguish themselves from their competitors due to the clearly articulated design identity in their portfolios since it signified a level of reflection that employers truly appreciate. In comparison to ePortfolios developed in previous terms, the outcomes produced from the innovative strategy discussed in this paper, reflected a more mature design identity, and personal style. Hence, we will continue to implement it in subsequent terms by placing more emphasis on self-reflection during each phase since it provides students with a well-refined direction for creating a successful ePortfolio.

References


THE COSTUME CULTURE ASSOCIATION

Instructions for Authors
Fashion, Industry and Education

(Enacted in 1998, most recently revised in April 2015)

Articles published by the Costume Culture Association (CCA) with the aim of accelerating the global exchange of ideas and theories in the field of fashion and textiles. The journal has its major focus on the cultural, aesthetic, historic and psychological aspects of clothing as well as on other areas such as marketing or textile science. The manuscript categories suitable for the journal include the following: (1) original research articles, (2) invited review articles of an authoritative and critical nature on a topic of major importance, (3) editorial articles, and (4) case reports. Submission can be made at any time by the email (tfie2015@gmail.com) or the manuscript submission website.

Submission of Articles

1) Manuscripts should be submitted through the email (tfie2015@gmail.com) or the manuscript submission website.

2) Other correspondences can be e-mailed to Dr. Eunah Yoh, Chief Editor, Fashion, Industry and Education, c/o Dept. of Clothing & Textiles, Hanyang University, 222 Wangsimni-ro, Seongdong-gu, Seoul 04763, Korea (e-mail: tfie2015@gmail.com, Tel: +82-10-6668-9959, Fax: +82-2-2297-1190)

4) Submit only manuscripts that have not been published elsewhere. The Costume Culture Association holds copyright for papers accepted for publication. Permission should be obtained from the Association for reproduction.

5) Author check list and Copyright transfer form can be found during the submission process via submission website.

Submission Guidelines

The following three documents should be included in the initial submission packet sent to the editorial board of the Costume Culture Association via the submission website.

1) The corresponding author can submit manuscripts in PDF file format. Confirmation of submission will be notified to the corresponding author via e-mail.

2) The Research Article Submission Form (including the manuscript title, name(s) and institutional affiliation(s) of all authors, contact information of the corresponding author) must be prepared and has to be sent with the research article manuscript.

3) Transfer of Copyright agreement must be completed, signed and sent along with the research manuscript.

4) For the policies on the research and publication ethics not indicated in this instructions, International standards for editors and authors (http://publicationethics.org/international-standards-editors-and-authors) can be applied.

Manuscript Preparation

Fashion, Industry and Education follows the guidelines of the Publication Manual of the American Psychological Association (Latest edition). All of the manuscript must be typed, double-spaced, including abstract, quotes, references, and tables. Use Times New Roman, font size 12 for all of the text in the manuscript, headings, figures, and tables. All paragraphs should be indented at the beginning of the paragraph by five spaces. Margins of one inch should be used on all four sides. The manuscript should be written in English with no longer than 4000 words in length. This includes all text including references and appendices. We follow the double blind review process.

1) Title page: In the title page, author information and manuscript title should be included, Manuscript title around 10-12 words and complete contact information (i.e., address, phone, fax, e-mail) of all authors should
be included. A corresponding author should be indicated and any acknowledgement notes should be presented in this page if applicable.

2) **Abstracts:** In the abstract page of the manuscript, title should be indicated and an abstract including objective, method, results, and conclusion should be presented with about 200-250 words. No indication of author information should be included in this page for blind review.

3) **Keywords:** Identify up to five key words by which the article may be indexed. Key words should be in alphabetical order.

4) **Table:** Follow SI units and SI units. Units of the data such as “cm” should be included in the upper right hand of the table in parentheses. Above the table, the title should appear.

5) **Figures:** All visual images other than tables should be listed as figures. Below the figure image, the title should appear. Consider proper resolution for printing images. Figures should be submitted either as photographs of sharp, black-and-white glossy prints or as camera-ready illustrations done professionally. The author(s) are responsible for securing permission to reproduce all copyrighted figures or materials before they are published in this journal.

6) **Subheadings:** Should have roman characters such as I. Introduction, II. Background, III. Methods, IV. Results, and V. Conclusion. In 12 point Fonts, The subheadings should follow numeric format as follows. 1. Data collection, 1.1. Questionnaire, etc.

7) **Reference Citations:** All manuscripts must follow the Reference Style Guide. The journal would accept the latest version of APA (The Publication Manual of the American Psychological Association) style as its standard reference citation method.

8) **Footnotes:** Should not be used in the manuscript.

9) **SI units:** Use the metric system of units followed by The International System of Units.

10) **Appendix:** If authors wish to use appendix, locate those before the reference list. Use numbering when needed such as Appendix 1, Appendix 2, etc.

**Peer review process**

All manuscripts are treated as confidential. They are peer-reviewed by at least two anonymous reviewers selected by the editor and associate editors. Letters to the Editor are reviewed and published on decision of the editor. The corresponding author is notified as soon as possible of the editor’s decision to accept, reject, or request revision of manuscripts. When the final version of revised manuscript is completely acceptable according to the CCA format and criteria, it is scheduled for publication in the next available issue. Rejected papers will not be peer-reviewed again.
THE COSTUME CULTURE ASSOCIATION

Code for reviewing papers submitted to Fashion, Industry and Education

Revised on June 23, 2011

1. This code regulates matters regarding the reviewing of papers submitted to Fashion, Industry and Education.

2. Each paper submitted to Fashion, Industry and Education is evaluated by a minimum of three reviewers. Publication is prohibited for papers ‘rejected’ by two or more reviewers.

3. The criteria for selecting reviewers are as follows: that are prominent scholars in the field of clothing and textiles and are serving either as an assistant professor or a higher position at a university or as a researcher director in a research institution are selected by the editing committee or the director of the editing committee. Reviewers are selected in consideration of the relation between their area of specialty and the submitted paper, as well as their research achievements and position. Reviewers are appointed by the president. However, special reviewers can be appointed for consultation on certain fields related to clothing or textiles.

4. The criteria for reviewing submitted papers are as follows: 1) creativity of thesis topic; 2) credibility and accuracy of data; 3) validity of research method; 4) thesis composition and coherence of description; 5) academic contribution; and 6) appropriateness of reference/English abstract form.

5. Manuscripts can be ‘accepted’, ‘denied’, or evaluated as ‘publishable after revision’ by reviewers. The results are reported to the director of the editing committee.

1) Manuscripts accepted or evaluated as publishable after revision by reviewers must be revised and complemented by the authors and are published after being verified by the editing committee.

2) Manuscripts that are ‘to be reconsidered after revision’ must be revised according to the reviewers’ comments and orders. The revised paper must be submitted with the ‘manuscript revision report’ and re-evaluated by reviewers.

3) If a paper is ‘denied’ by one of the reviewers, another reviewer is selected for the secondary review process.

4) Papers ‘denied’ by two or more reviewers in the first and secondary review processes cannot be published or re-submitted under the same title and content.

5) Submitted papers ‘accepted’ by reviewers can be ‘denied’ by the editing committee regardless of the results of the review, as publication may be denied for other reasons, such as violation of research ethics.

6) If an author fails to revise or complement a paper within six months after revision orders are given without a valid reason, the publication of the paper can be decided by the editing committee.

6. Reviewers must provide specific reasons to support their evaluation of manuscripts. The results of the review, along with the manuscript, must be returned to the association within 20 days. Reviewers that fail to return the results and the manuscript to the association within 30 days can be replaced.

7. The entire review process, from paper submission to publication, must be carried out anonymously. Reviewers must not disclose or misuse any information gained during the review process.

8. Any disagreements regarding the results of the review are resolved by the editing committee.

9. Decisions regarding paper publication are made by the editing committee in consideration of the application order of reviewed manuscripts.

※ Issues unspecified in this code are subject to decisions by the editing committee.
1. Purpose

This code organizes the “rules for operating the editing committee of the research journal” specified in Chapter 5 Article 19 of the Rules of The Costume Culture Association. The purpose of this code is to decide matters regarding the operation of the association editing committee and determine the editing duties related to the publications of this association.

2. Publication of journal

The following matters relate to the journal published by the Costume Culture Association.

1) The title of the journal is Fashion, Industry and Education.
2) The journal is issued twice a year.
3) The journal is issued by the president of the association (issuer) and edited by the director of the editing committee (editor).
4) The rights to the management of issued journals are held by the issuer.

3. Composition

1) The editing committee is composed of one director and editors.
2) The director of the editing committee is appointed by the president, in cooperation with the presidential body and operation committee, and must be approved by the board of directors.
3) Editors are recommended by the editor selection committee, which is composed of the presidential body, operation committee, and the director of the editing committee. Editors are appointed by the president and must be approved by the board of directors.
4) The director of the editing committee and editors are appointed to three-year terms and can serve consecutive terms.
5) The following matters must be considered in the selection of editors by the editor selection committee:
   (1) Editors must be professional scholars or experts with a Ph.D. in fashion and textiles.
   (2) Editors must be scholars who have participated recently in academic activities in fields of fashion and textiles and must possess an outstanding research record.
   (3) Editors must be appointed and evenly assigned to all fields related to fashion and textiles.
   (4) Editors must be selected in consideration of regional distribution and position.

4. Main duties

1) Review application and publication of manuscripts submitted to the Fashion, Industry and Education
2) Duties related to the editing and publication of Fashion, Industry and Education
3) Other editing and publishing duties related to academic books published by the Costume Culture Association

5. Operation

1) The editing committee is composed of both a temporary editing committee and a regular editing committee for publishing Fashion, Industry and Education
2) The temporary editing committee convenes at the request of the director of the editing committee or more than a third of the editing committee.
3) Matters concerning the editing committee are decided when a majority of the editors are present and when two thirds of the editing committee give their approval.

※ Issues unspecified in this code are subject to decisions by the editing committee.
Citing References in Text

1. Citing one work by multiple authors in text

The surname of the author and the year of publication should be inserted in the text using 「Surname(year)」format at the appropriate point.

1) Cite all names of authors when there are less than three authors

Lee and Kim(2011) found …
Characteristics of subcultures are … (Lee & Kim, 2011).

2) When a work has three, four, or five authors, cite all authors in the first time of citation; in subsequent citations, include only the surname of the first author which is followed by et al.

Hong, Johns, Smith, and Branden(2008) found…
Characteristics of subcultures are… (Hong et al., 2008).

3) When a work has six or more authors, cite only the surname of the first author which is followed by et al.

Hong et al. (2008) found…
Characteristics of subcultures are… (Hong et al., 2008).

2. Two or more works within the same parentheses

Order the citations alphabetically in the same order they appear in which they appear in the reference list.

Prior researches (Albert & Kolins, 2006; Edwin, 1998; Pepperberg et al., 1990) reported…

3. Groups as authors

The name of groups that serve as authors (e.g., corporation, associations) are usually spelled out in alphabetical order. The names of some group authors are spelled out in the first citation and abbreviated thereafter.

First citation: National Institute of Retailing (NIS) reported…
Second citation: Fashion industry is known to be… (NIS, 1999).

4. Translate works

List names of the original authors, and list both publication years of original work and translated work.

Fashion business is… (Frings, 2003/2011).

5. Newspaper/magazine articles without authors

List the title of the article as an author. When the title is too long, cite the few keywords of the title. Use double quotation marks around the title.
... are in fashion (“New style comes”, 2004).

6. Books without authors (reports, catalogs…)

List the title of the book in italics,

... are in fashion (Complete guide to sewing, 1987).

7. Secondary sources

Name the original work and give a citation for the secondary source in parenthesis. Give the secondary source in the reference.

Seidenberg and Mc Clelland’s research (as cited in Coltheart, 1993) …

8. Legal materials

Name of the legislation in 「」.

…「Mental Health Systems Act」(1988) …
… (「Mental Health Systems Act」, 1988) …

9. Patent

Give number, name and year(in parenthesis).


10. Pictures and images

Any pictures or images should be cited. In text these sources are introduced as Figures. Below the figures, give authors’ name, publication year (in parenthesis), page, URL if possible as the following format.

Fig. Title
From. authors.(year).p. http://www.costumeculture.or.kr

<Reference List>

- Arrange entries in alphabetical order by the surname of the first author followed by initials of the author’s given name.
- Include only the sources that you used in the article.
- Entries have to be a hanging indent.

1. Journal articles

1) Two authors


2) More than three authors


3) Journal article with DOI

**4) Online publication (DOI or URL)**


**5) Non-English article**


**2. Magazine article**

**1) Magazine article**


**2) Online magazine article**


**3. Newspaper article: Precede page number with p. or pp. (e.g., p. A1 or pp. B1, B3, B5-B7)**

**1) With authors**


**2) Without authors**


**3) Online newspaper article**


**4. Books**

**1) Authors as individuals: Authors, (year). Title of the book. Location: Publisher.**


**2) Authors as organizations: Name of the organization, (year). Title of the book. Location: Publisher.**


3) No author: *Title of the book*, (year). Location: Publisher.


4) Translated books: List the authors of the original work followed by the publication year of the translated work in parentheses. Give the English title followed by the translator’s name in parentheses.


5) Edited books


6) Non-English reference book: Give the title in the original language and, in bracket, the English translation


5. Conference papers

1) Proceedings published: Authors, (year). Title of the work, *Title of the Proceedings, volume, pages*.


2) Proceedings not published: Authors, (year, month). *Title of the work, Name of the Conference, City*.


6. Dissertations and Theses

1) Doctoral Dissertation


2) Master’s Theses


7. Secondary sources: Give the citation of the secondary sources only in the reference list.

8. Internet sources: Give the URL of the cited works.

9. Legal materials

1) Court decisions


2) Legislative materials


10. Patents: Include inventor(s) to whom the patent is issued and the official source from which the patent information can be retrieved.


11. Audiovisual Media

THE COSTUME CULTURE ASSOCIATION

「Fashion, Industry and Education」Code of Ethics

Revised on June 18, 2016

Preamble

The role of individual members of The Costume Culture Association is to expand their knowledge and to provide their knowledge and ability for the well-being of individuals and society through professional and scientific activities.

This Research Ethics Charter stipulates the principles and standards that members of The Costume Culture Association are required to follow in the course of their research and academic activities.

Its members’ duty is to always endeavor to act with the highest standard of ethical responsibilities. Members have an obligation to recognize the scope of their knowledge and ability on the basis of professional and scientific activities and to try to escape from the personal, social, economic, and political influence that may make them exploit or abuse their knowledge and ability.

Chapter 1. General Ethics

Article 1 Basic Obligations of Members

1. Members shall strive for the development of individuals and society,
2. Members shall carry out tasks truthfully, honestly, and accurately in the fields of academic research, teaching, and assessment,
3. Members should be aware that their work could have an impact on society and humanity and, therefore, perform their responsibilities as experts based on trust,
4. Members shall use their best efforts to ensure that the results of their research and services can be provided fairly to everyone who needs them,
5. Members respect the dignity and value of people, as well as individuals’ rights to privacy and self-determination,

Article 2 Expertise

1. Members’ efforts should be continued to develop and maintain their skills and expertise,
2. Members shall pursue scientific knowledge in their professional fields and should constantly strive to deliver it accurately,

Article 3 Work-related Relationships

1. Members shall respect fellow members and shall not give criticism that is not based on facts in regard to the work-related activities of fellow members,
2. Members will work collaboratively with professionals in other fields of expertise while maintaining integrity and patience,

Chapter 2. Research-related Ethics

Article 1 Academic Freedom and Social Responsibilities

Members engaged in research have the fundamental right to academic freedom and the social obligations and responsibilities that it entails,

1. Members should not discriminate on the basis of ideology, religion, age, gender, social class, or cultural group and should accept and recognize academic achievements in their own rights,
2. Members shall endeavor to correct their errors if convincing evidence has been found to refute their claims,
3. Members shall review new research issues, system of thought, and approaches without prejudice,
4. For research including experiments on humans or animal testing, the approval, permission, and enrollment conditions must be disclosed. Additionally, manuscripts should be written in a way that protects the research subjects as much as possible.

**Article 2 Research-related misconduct**

1. Members shall not commit plagiarism, fabrication, falsification, unjustified authorship, or other acts that deviate from the acceptable range in each academic field. Fabrication is the act of inventing data or results without actually measuring them or acquiring them through investigation. Data falsification is manipulating research procedures or changing or omitting data without reasonable justification. Unjustified authorship is defined as the act of not attributing authorship to an individual who has made scientific contributions or attributing authorship to an individual who has not made scientific contributions, which is prohibited on the grounds of treating others with honor.

2. When Members discover critical errors from the published data, members shall take measures to rectify the errors using appropriate publication means, such as correction, cancellation, and errata. If a publication is suspected of research misconduct, the manuscript’s original view service through the journal homepage is temporarily suspended until a verdict has been reached. If the manuscript is cleared of suspension, the service is resumed.

**Article 3 Publishing Credits**

1. Members are only responsible and accredited as an author for studies they have conducted or contributed to.

2. With regard to the order of author names in an article, the order shall accurately reflect authors’ relative contribution to the study, regardless of hierarchical position.

3. All people who contributed to the manuscript have authorship. When members request to add or remove an author or to rearrange the author names, the following regulations are followed.
   1) An authorship change is only possible when all authors agree with the change.
   2) An authorship change follows the decision by the editorial committee after the submission of a statement of reason for change signed by all authors.
   3) If the editorial committee approves the authorship change, the author(s) have to send the submission form, copyright transfer agreement, and declaration of ethical conduct form, explicitly stating the full author list.
   4) All authorship changes are only possible before publication.

4. When an article stems from a master’s thesis or a doctoral dissertation, the relevant student shall be the first author. The author has to indicate that the manuscript is condensed from the author’s master’s thesis (doctoral dissertation).

**Chapter 3. Review-related Ethics**

**Article 1 Review**

1. Reviewers should respect the confidentiality of the review process. It is important to recognize that the manuscript is confidential. Reviewers should not cite the manuscript before publishing without permission.

2. Reviewers should be prompt with their reviews unless a reason is given.

3. Reviewers should evaluate manuscripts according to objective standards, regardless of personal relationships with the authors or personal beliefs.

4. When research misconduct or redundant publication is discovered during the review process, the reviewer should inform the editorial board of the result and return it. If the misconduct is proven to be true by the ethics committee, the committee retracts journal publication and reports to the author(s), affiliated institution, and other related institutions.

**Chapter 4. Guidelines for the Implementation of the Code of Ethics**

**Article 1 Pledge to Code of Ethics**

And individual must pledge to the Code of Ethics to become a member of The Costume Culture Association. Those who were already members when this Code of Ethics took effect are deemed to have pledged to it.
Article 2 Research Ethics Committee Establishment and Operation
1. The Costume Culture Association establishes a research ethics committee in order to reach a verdict on code of ethics violations. The Ethics committee constitutes the president, vice president, editor in chief, advisers, and external specialists. The president is in charge of the committee chairperson, and a chairperson can appoint an expert at the committee meeting.
2. The function of the committee is to reach a verdict on claimed issues of research ethics in papers or reports with regard to the association, investigation of research misconduct in the association, and other claimed issues of research ethics.
3. When the committee reaches a verdict of misconduct, the committee requires over half of the committee members to attend and makes a decision with the agreement of two thirds of the attendees.
4. A chairperson reports the results of the investigation to whistleblowers, respondents, and other related persons promptly.
5. When the respondents or whistleblowers protest against a committee’s decision, they can request reinvestigation in writing within fourteen (14) days from the date on which they receive the notification.

Article 3 Cooperating with ethics committee and guaranteeing the opportunity to explain themselves
1. The members reported for violation of the Code of Ethics shall cooperate with the investigations conducted by the Ethics Committee.
2. Members who have been reported for violation of the Code of Ethics should be given sufficient opportunity to explain themselves.

Article 4 Protecting the rights of respondents
The society shall permit no release of information about individual persons that have been accused as offenders until the final declaration of a violation is made.

Article 5 Result of Research Ethics violation
The research ethics committee shall impose a sanction against the author who is determined to have carried out research misconduct as well as against their research paper based on the seriousness of the misconduct and according to the regulations of the National Research Foundation of Korea.
1. Retraction of journal publication, deletion of the research paper from the corresponding issue of the academic journal
2. Banned from submitting an article to the journal for a certain period of time (at least three years)
3. Notify readers of the journal publication retraction officially through the journal homepage
4. Suspension and disqualification of membership
5. Notification to the related institution and the National Research Foundation of Korea providing detailed information about the author’s misconduct.
6. Other disciplinary action

Article 6 Amendments of the Code of Ethics
The procedure of amending the Code of Ethics is consistent with the amendment procedures of The Costume Culture Association. If the Code of Ethics is amended, it shall be deemed that The Costume Culture Association-affiliated members will have automatically pledged to the new Code of Ethics without a further pledge insofar as they have already pledged to the existing Code before the amendment.

By law
For the policies on the research and publication ethics not indicated in these instructions, international standards for editors and authors (http://publicationethics.org/international-standards-editors-and-authors) can be applied.

The CCA Code of Ethics has been in effect since June 2016 under the approval of the board councils,
# THE COSTUME CULTURE ASSOCIATION (CCA)

## Fashion, Industry and Education

### Research Article Submission Form

**Title of the research**

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**Name and contacts of the Corresponding Author**

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**Funds that supported the research (if applicable)**

**Has this research been presented at the Costume Culture Association Annual Conference?**

If yes, when was the conference? (For example, Spring 2016)

**Is this research a part of the author’s thesis or dissertation?**

If yes, indicate the degree issue date. (For example, August 2016)

(For official use only)

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Authors are asked to check the following items for the research review.

1. General

   (  ) This research article is original and has never been published in any other journals.

   (  ) This research article is not in the review process of any other journals.

   (  ) The research meets the ethic rules of Fashion, Industry and Education Culture(http://www.costumeculture.or.kr).

   (  ) The Ethic Confirmation Form is included with the submission of the research.

   (  ) The research paper prepared in pdf file format does not contain any information of authors.

   (  ) The research paper does not exceed 18 pages of A4 size paper including all figures and tables(except references).

   (  ) The article submission fee is paid to the Costume Culture Association(KB Kookmin Bank 097601-04-198182). 
     (For now, submission fee is waived for research articles submitted from outside of Korea)

2. Abstract and Keywords

   (  ) The abstract is written in English, including study objectives, methods, results, and conclusions with about 200-250 words.

   (  ) Keywords are maximum five major words listed under the abstract.

3. Main text and References

   (  ) All figures and tables are written in English.

   (  ) All references are written in English.

   (  ) Follows the reference style of Fashion, Industry and Education (APA style manual; http://www.costumeculture.or.kr).
**Title of the research**

| English |

All authors would like this research article to be published in “Fashion, Industry and Education” and agree to the following:

1. All authors confirm that the research article does not violate any others' copyrights and confirm its originality.

2. All authors have made a real and intellectual contribution to this research article and share the whole responsibility to its contents.

3. All authors confirm that this research article is not involved in any ethical issues such as plagiarism, fabrication, falsification, unreasonable authorship including duplicate publication and self-plagiarism or any other violations of academic misconducts. By signing this form, I declare that the information provided in this form is true to the best of my knowledge and judgment.

4. This research article has not been published and has not or will not be submitted to another journal for publication.

5. “Fashion, Industry and Education” has rights in legal action against the infringement of copyright of this research article without authors' sanction.

6. In consideration of the The Costume Culture Association taking action in reviewing and editing my submission, the author(s) undersigned hereby transfer(s), assign(s) and otherwise convey(s) all copyright ownership to The Costume Culture Association in the event that such work is published by The Costume Culture Association.

* Transfer of Copyright Agreement Form should be included in the initial submission packet sent to the Fashion, Industry and Education Editorial Board.

* A signed and scanned form (pdf or jpg format) is acceptable.

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Declaration of Ethical Conduct in Research

I declare that I have abided by the following Code of Research Ethics while writing this paper.

“First, I have strived to be honest in my conduct, to produce valid and reliable research conforming with the guidance of ethical regulations for Fashion, Industry and Education, and I affirm that my paper contains honest, fair and reasonable conclusions based on my own careful research under the guidance of ethical regulations for Fashion, Industry and Education.

Second, I have not committed any acts that may discredit or damage the credibility of my research. These include, but are not limited to: falsification, distortion of research findings or plagiarism and false authorship.”

Date ____________________

Paper Title :

(Corresponding) Author : (Signature)

Institute :