Typology of Fashion Product Consumers:
Application of Mixture-model Segmentation Analysis

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Abstract
Proper consumer segmentation is receiving more attention from industry professionals as markets become more diverse and consumer-centered. Researchers have recognized the limitations of the traditional cluster analysis technique and this research study analyzes market segmentation using Mixture-model or latent-class segmentation. This study used a questionnaire to determine the characteristics of clothing shoppers using a new technique that proved its superiority over traditional techniques. Questions included items measuring fashion shopping behavior, store choice criteria, apparel consumption styles, price perception by product type, and demographic characteristics. Data were collected from 1074 males and females in their 20s and 30s through an online survey. SPSS 16.0 and Latent GOLD 4.0 were used to analyze the data. The ideal typology of clothing shoppers using the Mixture-model were: ‘brand loyalty orientated group’, ‘group of conservative late 30s’, ‘group of pleasure-emotion early 20s’, ‘value oriented consumer product with high-income group’, ‘group of eco/symbol oriented consumer’, and ‘group of utility/goal oriented male consumer’. This study showed differences in fashion product purchasing behavior by conducting market segmentation for clothing shoppers using the Mixture-model. 

Key words: Clothing shopper, Segmentation, Mixture-model

I. Introduction
In recent years, consumption spending has changed due to economic and social alterations, as well as changes in the quality of people's lives. The distribution industry is experiencing cutthroat competition because of the new business environment. Thus, the market is getting more competitive (Kim & Kwon, 2011). As society becomes more complicated and diversified, the consumption market gets more fragmented. In order to succeed in business, companies should perceive the consumers' needs and satisfy their demands (Kim & Choi, 2009). According to the heterogeneous nature of the consumer, companies should separate properties by conducting homogeneous differentiated marketing.

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The fashion market focuses on consumers and maximizing consumers' satisfaction. An increase in demand in the fashion market has gradually made consumers' demands diverse and more complicated. Therefore, fashion industries should move away from focusing on an increase in the trade only and exert every effort to establish an efficient marketing strategy satisfying individual consumers' demands (Kwak & Lee, 2002).

Many studies have focused on fashion market segmentation so apparel firms can better satisfy different consumer groups. Accordingly, researchers have analyzed market segmentation. However, this kind of traditional cluster analysis has limitations, according to prior studies. With the intention of solving the limitations of the existing cluster analysis, market segmentation through a Mixture-model (Latent-class; Latent-class Cluster Analysis; Mixture Likelihood Approach Clustering;
Mixture-model Clustering (Model-based Clustering) was brought out (Bhatnagar & Ghose, 2004; Cohen & Ramaswamy, 1998; Han & Kwak, 1997; Kim et al., 2007; Kim et al., 2003).

In recent years, there has been an online/offline switch to various products in consumer-oriented industries. In addition, there are more studies about consumer segmentation using potential models. This type of segmentation would suggest more in-depth efficient marketing strategies. After consumer market segmentation, segmentation variables’ validity verification is necessary. Consequently, defining the difference of fashion purchasing behavior based on market segmentation, it could clarify significant variables that segment fashion product consumers.

This study assumes that consumer segmentation should be dealt with more in-depth. The importance of that takes a huge part in the apparel and fashion business. Therefore, this study enforced market segmentation using a Mixture-model that may solve the limitations of the existing market segmentation method. It also examined which variable is significant for market segmentation, including consumers' demographic variables and fashion purchasing behavior that explains consumers' diverse shopping values and purchasing behaviors'. In addition, it comprehends that the characteristics of buying a fashion product depends on segmented groups of clothing shoppers. Likewise, this study would provide useful information to offer differentiated marketing strategies through market segmentation using a Mixture-model for fashion product consumers.

II. Literature Review

1. Market Segmentation in Fashion

Market segmentation became an important concept immediately after Smith (1956) introduced it. Segmentation is based upon developments on the demand side of the market and represents a rational and more precise adjustment of product and marketing effort to the consumer or user requirement (Smith, 1956). The process of the subdivision of consumers is based around what is the most important subdivision question.

Although market segmentation has been studied, the efficiency and effectiveness of market segmentation continues to bring problems, since the change of lifestyle, income, race, and age increases consumers' needs and the diversity of purchasing behavior. Also, problems of predictions about real consumer behavior, the existing market segmentation method, and the effectiveness and efficiency of the standards are pointed out (Lee Quinn & Bennison, 2007; Sheth et al., 2000).

There are four primary problems. Firstly, geographic segmentation calls for dividing consumers into different geographical units. Even though Korea has small geographical units, capital areas display differences in clothing behavior due to the differences of traffic level, distribution-channel possession level, and the cultural level. Segmentation by geographical variables is simply established and the measurement and approach of the market is easy, but these segmentations using only geographical variables takes risks to explain consumer buying behavior (Park, 2006). Secondly, demographic segmentation divides a market based on age, gender, family size, occupation, education, religion, and race. It is essential to realize that the market size depends on the demographic variables, but using integrated demographic variables brings limitations to understanding consumer clothing behavior. Thirdly, Social psycho graphic segmentation divides consumers into groups based on social class, lifestyle, or personality characteristics. Today, lifestyle market segmentation is the formation of a consumer-driven market, where the market is becoming clearly more sensitive and targeting markets is more important to help in product positioning (Green et al., 2006). Fashion product buyers who seek value consumption would be segmented more in detail and their demands would be shown more specifically. Fourthly, behavioral segmentation divides a market based on consumer knowledge and responses; it is subdivided based on seeking benefits, brand loyalty, distribution channels, purchasing products, and the standard of store decisions, price sensitivity, and the fashion information source. Generally, existing fashion market segmentation selects variables. It then divides buyers based on a single variable and understand consumers' clothing behavior according to segmented groups. However, studies remain the same because the
existing method does not reflect the diverse aspects of consumer behavior.

Mentioned above, market segmentation variables could be used as standard for distinguishing consumers in fashion markets. Among them, behavioral variables are used as not only standard variables, but also dependent variables, to define a difference among the buying behaviors of the segmented consumers. After segmenting markets into groups, understanding each group’s clothing buying behavior proves how well each consumer group is defined. It demonstrates that the measurement tool is powerful enough by showing different behavioral variables with segmented groups through measuring the predictive validity (Nunnally & Bernstein, 1994).

Kim (1994) cites that a store decision criterion is different, depending on clothing shopping tendencies and hedonic-shopping tendencies. It considers brands or trends as important factors when selecting stores. Soo et al. (2008) conducted market segmentation through the Mixture-model based on the demographic characteristics of home-shopping users. Each segmented group showed a difference about the decision standard of home-shopping companies. Choi (2005) divided consumers using the Mixture-model based on shopping motives and defined that there was a difference in the store decision standard for each segmented group. Likewise, each segmented group’s store decision criteria of the fashion product showed significant differences.

Shim and Drake (1988) demonstrated that buyers’ characteristics in the fashion market have the largest explanatory power on information searching behavior. As a result, there was a difference between a group maintaining a fashionable lifestyle and a group not interested in fashion. Kim and Choi (2009) segmented consumers based on the clothing shopping tendency of male consumers who are the digital generation and investigated a difference among the segmented groups. It was determined that the independent shopping seeking model, shopping indifference model, and high shopping participation model used different fashion information sources.

Consumers’ preference to buy fashion products, according to the pay range and price level, is represented differently. Buyers who have a strong innovative tendency would be willing to pay more money for a new product (Goldsmith et al., 2005). Also, if consumers have a brand that they are loyal to, they would not sensitively react to the price of that brand (Choi et al., 2006). Fashion products show differences in price levels depending on product type. Buyers are likely to pay more money for suits, but less money for casuals (Shin et al., 2006). Likewise, there was a difference in terms of price level based on segmented groups’ characteristics of fashion markets.

Besides the previously mentioned behavior variables, fashion store visiting frequency, fashion product buying frequency, apparel expenditures, hours spent in a fashion store, and fashion store browsing showed differences in subdivision markets (Jung & Chung, 2004; Lee et al., 1999; Soo et al., 2008). This study attempts to segment the fashion market through the Mixture-model based on main market segmentation variables and verify differences among the many buying behavioral variables to prove the validity of the market segmentation. Accordingly, it could be confirmed that the Mixturemodel’s market segmentation of fashion product buyers has a prediction capability and strong confirmation of the measurement and segmented variables.

2. Market Segmentation Using the Mixture-model

The Mixture-model is a tool used to solve the limitation of the existing market segmentation method. It is also referred to as the Latent-class, Latent-class Cluster Analysis, Mixture Likelihood Approach Clustering, Mixture-model Clustering, or Model-based Clustering (Bhatnagar & Ghose, 2004; Cohen & Ramaswamy, 1998; Han & Kwak, 1997; Kim et al., 2007; Kim et al., 2003). Market segmentation using the Mixture-model has no limitation for measurement types and is the method used to verify the characteristics of the groups after they are tied based on characteristics of a particular segmented market. Its advantages are reflected in the various behaviors of consumers. This is noted by the fuzzy probability and identifying reasonable numbers of segmented markets statistically. Currently, both on-line and off-line diverse product line industries turn into consumer centered markets. There are many studies about consumer segmentation using
the Mixture-model. This suggests that efficient marketing strategies are important for the future. The Mixture-model could be used in fashion research for the effective division of market segmentation. Han and Kwak (1997) had used a Mixture-model to divide a market based on the marketing characteristics of the jeans market. Three groups are segmented by brand, price, design, and color of jeans. They represent clear differences of preferences between brands and prices. Kwak and Lee (2002) used the Mixture-model based on brand, price, design, and color in the jeans market for segmentation. The results came out with five groups and each group showed differences in preference of brand, design, color, and price level.

Choi (2008) proved that a number of segmented markets of shopping motives of men and women are different using the Mixture-model. Male consumers are segmented as enthusiastic shoppers, indifferent shoppers, and simple reason buying shoppers. Female consumers are segmented as enthusiastic shoppers, indifferent shoppers, buying with simple reason shoppers, and escaping daily life shoppers.

Recently, apparel industries are experiencing growing shares of internet or TV home-shopping purchases. Thus, besides the off-line market, a company should work on an effective marketing strategy by understanding the characteristics of each segmented market in the home-shopping area. Seo et al. (2008) used the Mixture-model to divide the market based on demographic variables, such as gender, age, education, occupation, and income. As a result, four segmented groups are segmented and each group has differences among buying hours, number of buying purchasers, price, place, product, motive, and overall satisfaction.

In spite of the advantages of the Mixture-model, which are more specific to divide a market, and providing efficient marketing strategies, not many researchers have been using it, until now. This study applies the existing variables, as well as variables that represent current consumers' characteristics, to segment the market by disparate buying behaviors using the Mixture-model.

III. Methods

1. Research Purpose

This study analyzes market segmentation using a Mixture-model based fashion shopping behavior (Hedonic/Sensitive Seeking; Personalized Seeking; Information Seeking; Eco Seeking; Innovative Seeking; Price Seeking; Brand Seeking; Symbolic Seeking). The purpose of this study was 1) to find for defining significant variable using stepwise method with sex, age, and income as covariate variables and also 2) to find differences in fashion shopping behavior between segmented groups. <Fig. 1> explains study model.

![Fig. 1. Research process & model.](image-url)
2. Measurement and Data Analysis

The questionnaire consists of 94 questions, based on fashion product shopping behavior of consumers (Arnold & Reynolds, 2003; Dawson et al., 1990; Dickerson & Gentry, 1983; Eastlick & Feinberg, 1999; Gutman & Mills, 1982; Jamal et al., 2006; Lysons et al., 1996). All statements were through the use of 5 point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). And criteria of store choice (Shim & Kotsiopulos, 1992), typical apparel consumption styles, price level by product type (suit, casual, luxury accessory), and demographic characteristics of them were composed for questionnaire as nominal scales.

Data were collected from male and female of 20s and 30s as purposive sampling. 20s consumers including college students and society beginners have a high interest in fashion and shopping and they emphasize their personality through apparel (Yoon & Hong, 2007). Consumers in 30s are the actual consumption level after a global depression in 2008 (“Consumer environment in 2009”, 2010), so understanding consumers in 30s’ demands and dividing segmentation market are required. Data collection was done through on-line questionnaire and prevent from repeated answers by using IP address and cookie. Total 1100 answered the questionnaire and used 1074 excluding inadequate questionnaires.

This study used SPSS 16.0 to analyze the data with frequency, \( \chi^2 \) test, Exploratory Factor Analysis (EFA), reliability analysis, and ANOVA. Evaluating validity of measurement, Confirmatory Factor Analysis (CFA) is used through AMOS 5.0. Latent GOLD 4.0 was used to scrutinize Mixture-model for practical market segmentation.

IV. Results and Discussion

1. Exploratory Factor Analysis of Fashion Shopping Behavior

In order to investigate fashion shopping behavior levels and whether shopping behavior’s range, drawn from literature review and qualitative research, exists when buyers shop apparel or fashion products or not, an exploratory factor analysis was enforced. The reliability was assessed through Cronbach’s alpha coefficients. Result of reliability analysis and factor loadings showed eight factors of 24 questions. Varimax method was used for factor analysis and number of factor is designated by Scree test; all eigen values were over one. These eight factors explained 74.35% of whole variables’ value and each factor’s reliability of composed question represented .73-.87.

Factor 1 was called “hedonic/sensitive seeking”, seeking enjoyment motives, emotions, and experiences rather buying fashion products only. The factor loadings ranged as from .61 to .87 with a high reliability \((\alpha=.87)\). Factor 2 was “personalized seeking” that reflects an individual’s taste about fashion product and was provided with information and services individually. Factor loadings ranged from .70 to .81 with Cronbach’s alpha of .77. “Information seeking” was Factor 3 which purchase products with adequate information by searching fashion information. The factor loadings of information seeking were between .69 and .84 with high Cronbach’s alpha of .84. Factor 4 was “eco seeking” that accentuates eco-friendly fashion shopping behavior and showed factor loading between .81 and .89 with high Cronbach’s alpha of .85. Factor 5 was “innovative seeking” which was sensitive and looks for new fashion and trends. The factor loadings ranged as from .68 to .82 with a high reliability \((\alpha=.83)\). “Price seeking”, Factor 6, was sensitive to price when buying apparel or fashion products. Factor loadings ranged from .70 to .83 with Cronbach’s alpha of .73. Factor 7, “brand seeking”, was habitually purchase same brand’s apparel due to a possession of preferred brand. The factor loadings of brand seeking were between .88 and .90 with high Cronbach’s alpha of .84. Factor 8 was “symbolic seeking” that considered symbolism through apparel very crucial and has high consciousness. It showed factor loading between .88 and .89 with Cronbach’s alpha of .74.

2. Confirmatory Factor Analysis of Fashion Shopping Behavior

To assess validity of fashion shopping behavior (eight factors: hedonic/sensitive seeking, personalized
seeking, information seeking, eco seeking, innovative seeking, price seeking, brand seeking, symbolic seeking), confirmatory factor analysis was conducted through AMOS 5.0. Their indicators were conducted to assess construct, convergent, and discriminate validity. First, the CFA model showed $\chi^2=950.880$ ($df=221$, $p=.000$), GFI=.93, AGFI=.90, CFI=.94, NFI=.92, and RMSEA=.06. Therefore, this CFA model used a standard that goodness-of-fit was desirable when it was over .90 (Bagozzi & Yi, 1988; Joreskog & Sorbom, 1996). Also, this CFA model used CFI (Comparative Fit Index) that Bentler (1990) suggested a standard. The more CFI was near “1”, the more goodness-of-fit was excellent; it was desirable when it was over .90. Less than .05 of RMSEA (Root Mean Square Error of Approximation) is desirable but, if sample was large, this CFA model is adequate even under .08 of RMSEA (Bagozzi & Yi, 1988).

Table 1 indicates the results of the CFA for construct correlation, convergent validity, Cronbach's alpha, construct reliability, and AVE (Average Variance Extracted). Construct reliability and AVE calculated directly and analyzed through standard that Dillon and Goldstein (1984) suggested. It is good enough to obtain when construct reliability was higher than 7, consistency among the variables of measurement (Hair et al., 1998). Since all values of AVE measured over 5, this CFA model was confirmed convergent validity that each factor measured exactly definition to do measurement (Dillon & Goldstein, 1984).

Next, analysis result of the CFA for discriminate validity identified each concept is different with the fact that 28 pairs were over threshold value, $\chi^2$($df=1$) = 7.88, based on all values of $\chi^2$ are over .001. The way to confirm these eight factors’ differences is pairing up two factors each, and then compare four groups that limited correlation as one and that did not.

Likewise, a level of fashion shopping behavior, market segmentation variable resulted from Mixture-model, was identified through EFA and CFA. Therefore, this study will conduct consumer market segmentation using Mixture-model with use of eight levels of fashion shopping behavior as main variables, market segmentation variables.


In this study, as already discussed on market segmentation analysis, in order to properly understand the characteristics of clothing shoppers including the various parameters for market segmentation was performed. Segmentation variables for market segmentation were selected as "fashion shopping behavior" that many

<table>
<thead>
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<td>Average Variance Extracted (AVE)</td>
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$*p<.05$, $**p<.01$

$\text{Construct Reliability} = \left(\frac{\Sigma \text{Standardized Regression Weights}^2}{\Sigma \text{Standardized Regression Weights}^2 + \Sigma \text{error variance}}\right)$

$\text{Average Variance Extracted (AVE)} = \frac{\Sigma \text{Standardized Regression Weights}^2}{\Sigma \text{error variance}}$
finding from the measured values on the actual consumers through exploratory/confirmatory factor analysis. In previous research has indicated, demographic variables is the most basic and significant criteria. Therefore, this study conducted mixture-model analysis by utilizing sex, age, and income as covariates.

1) Stage 1: Market Segmentation Using Fashion Shopping Behavior

As a first stage, market segmentation executed for clothing shoppers using Mixture-model based on consumer fashion shopping behavior variables. Proper number of segmented groups was assessed through statistics showing in Table 2. In case of augment the market segments 6 to 7, the result shows that the most significant reduction of BIC. Also, $R^2$ value indicates the model fit to 0.84 which refers to model conformity. Therefore, 7 market segments were identified as the appropriate for market segmentation using Mixture-model based on consumer fashion shopping behavior variables.

The result of each market segments measurement indicated account for 20.4% of segment 1, 18.3% of segment 2, 17.7% of segment 3, 15.1% of 4, 9.1% of segment 5, 9.1% of segment 6, and 4.9% of segment 7. The first stage for market segmentation for clothing shoppers using Mixture-model is implementation of seven groups was found to be adequate. However, many consumers' groups were negative affected by characteristics of each segment groups. Also, this result only established fashion shopping behavior factors which could not find consumers' characteristic which this result has the limitation for usage in fashion industry. Accordingly, this study add consumers' basic characteristic of demographic variables of covariates to identify characteristics of each segment groups more specifically.

2) Stage 2: Market Segmentation Using Fashion Shopping Behavior and Covariate (sex)

Second stage of market segmentation for clothing shoppers using Mixture-model conducted on the base of consumers' fashion shopping behavior variables and to insert sex covariate for market segment. In general, many researchers conducted more than the interval/ratio scale cluster analysis, and then implement cross-analysis in order to investigate the characteristic between clusters. However, in Mixture-model of Latent Gold treat demographic variables as covariate to reveal the differences between segment groups (Vermunt & Magidson, 2002). Table 3 provided the result for goodness-of-fit analysis according to samples of market segments. In case of increase to five market segment from four market segment, the result identified most significant reduction of BIC. Additionally, $R^2$ value represents goodness-of-fit was .81 which attained highest level. Therefore, 5 market segments were identified as the appropriate for market segmentation using Mixture-model based on fashion shopping behavior variables and sex (covariate).

The result of each market segments size measurement indicated 26.5% of segment 1, 23.1% of segment 2, 18.7% of segment 3, 16.5% of segment 4, 15.2% of segment 5. Market segmentation analysis in the first stage was difficult to identify the characteristics of consumers besides main variables of fashion shopping behavior. In the second stage of market segmentation, the result established characteristic of each market segment.

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ment correlate with sex differences due to insert gender as a covariate. In the third stage, this study will additionally insert demographic variables of age as a covariate other than sex to look in more detail of characteristic of each segmented groups.

3) Stage 3: Market Segmentation Using by Fashion Shopping Behavior and Variables of Sex and Age as a Covariate

In order to conduct market segmentation on third stage using Mixture-model for clothing shoppers, this study was examined based on fashion shopping behavior variables of consumer and inserted variables of sex and age as a covariate. As identified on stage 2, this study executed to analyze the differences between each segment groups using demographic variables treat as a covariate in Mixture-model. <Table 4> provided the result of goodness-of-fit analysis according to samples of market segment. In case of increase the market segment to 5 market segments from 4 market segments, the significant decrease in BIC is found for analysis of five market segmentation. $R^2$-value represented goodness-of-fit also showed .77 which was highest rate and provides the strong result. Therefore, most appropriate for market segmentation using Mixture-model based on fashion shopping behavior variables and treated variable of sex and age as a covariate was indentified 5 market segments.

The result of measurement for size of each market segments, market segment 1 rate indicated 27.2%, 21.6% on market segment 2, 21.3% on market segment 3, 19.4% on market segment 4, and 10.6% on market segment 5.

In second stage, this study conducted a market segmentation to only insert sex variables treating as a covariate, in third stage, adding a covariate variable of age to implement market segmentation. The result from the market segmentation analysis on stage 3 indicated that characteristics of each segment groups were possessed differentiated characteristic to some degree. To insert 'income' for the additional covariates in favor of revealing the income level differences on each segment groups in order to find more specifically differences on stage 4 which did not show on stage 3.

4) Stage 4: Market Segmentation Using Fashion Shopping Behavior and Covariate (sex, age, income)

In order to conduct market segmentation on forth stage using Mixture-model for clothing shoppers, this study was examined based on fashion shopping behavior variables of consumer and inserted variables of sex, age, and income as a covariate. As identified on stage 3, this study executed to analyze the differences between each segment groups using demographic variables treat as a covariate in Mixture-model. <Table 5> provided the result of goodness-of-fit analysis according to samples of market segment. In case of increase the market segment to 6 market segment from 5 market segment, the significant decrease in BIC was found. $R^2$-value represented goodness-of-fit also showed .78 which was highest rate and provides the strong result. Therefore, most appropriate for market segmentation using Mixture-model based on fashion shopping behavior variables and treated variable of sex, age, and income as a covariate was indentified six market segments. The result of measurement for size of each market segments, market segment 1 rate indicated 24.1%, 19.7% on market segment 2, 16.3% on market segment 3,16.1% on market segment 4, 13.3% on market segment 5, and 10.3% on market segment 6.

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<Table 3> Stage 3: Goodness-of-fit according to number of market segmentation (covariate: sex)
tation analysis using Mixture-model based on fashion shopping behavior variables and inserting variable of sex, age, and income as a covariate. Wald statistics were used to determine the significant differences of explanatory variables among segment groups. From the result, all the Wald statistic variables of p-value were less than .05 which represents that all the predictive variables had a significant difference between segment groups.

Most of the first segment group consists of late 20s to early 30s consumers and highest proportion for monthly income of this group was 2 million to 6 million won. This group particularly appears the great influence on brand loyalty orientation. From that result, we expected consumers in this group have a fashion brand and they are very loyal to it. Hence we can name this group for ‘brand loyalty orientated group’.

The second segment group consisted of the largest percentage (30%) among the total of male consumers, the majority proportion of this group was consumers of late 30s (31%). This group showed dramatically inappropriate influence on hedonic/sensitive seeking and innovative seeking. This group was composed of consumers with conservative oriented when purchasing apparel and fashion products. Accordingly, this group was named as ‘group of conservative late 30s’.

The third segment group consisted of the largest percentage (27%) of female consumers, the majority proportion of this group was consumers in their early 20s (26%). This group had positive influence on hedonic/sensitive seeking, and negative influence on eco seeking, brand seeking, and symbolic seeking. Therefore, we named this group as ‘group of pleasure-emotion early 20s’.

The majority of forth group (32%) was high-income earner that their monthly average income was more than 6 million won. This group showed positive influence on hedonic/sensitive seeking, information seeking, eco seeking, and symbolic seeking. Especially, this group particularly showed higher scores on eco seeking and symbolic seeking than other groups. This group considered clothing shopping as pleasure behavior to release the stress and refresh themselves and this group preferred to purchase environmental friendly product and premium fashion products at the same time. They also carefully considered when searching the information for possibly expected brands before they purchase clothing as well as fashion products. Therefore, this group named as ‘group of eco/symbol oriented cultural orientation’.

Table 4. Stage 3: Goodness-of-fit according to number of market segmentation (covariate: sex, age)

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<tbody>
<tr>
<td>2</td>
<td>-9474.11</td>
<td>19206.46</td>
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<td>.72</td>
<td>.76</td>
<td>58</td>
<td>.11</td>
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<td>3</td>
<td>-9233.06</td>
<td>18952.66</td>
<td>253.80</td>
<td>.70</td>
<td>.77</td>
<td>79</td>
<td>.14</td>
</tr>
<tr>
<td>4</td>
<td>-8726.55</td>
<td>18851.83</td>
<td>100.82</td>
<td>.77</td>
<td>.83</td>
<td>100</td>
<td>.12</td>
</tr>
<tr>
<td>5</td>
<td>-8580.44</td>
<td>18815.02</td>
<td>700.81</td>
<td>.74</td>
<td>.81</td>
<td>121</td>
<td>.14</td>
</tr>
<tr>
<td>6</td>
<td>-8747.65</td>
<td>18486.34</td>
<td>-480.98</td>
<td>.74</td>
<td>.79</td>
<td>142</td>
<td>.14</td>
</tr>
</tbody>
</table>

Table 5. Stage 4: Goodness-of-fit according to number of market segmentation (covariate: sex, age, income)

<table>
<thead>
<tr>
<th>Number of market segmentation</th>
<th>LL</th>
<th>BIC</th>
<th>BIC range</th>
<th>$R^2$</th>
<th>Reduction error</th>
<th>Number of parameter</th>
<th>Classification error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-9467.38</td>
<td>19213.93</td>
<td></td>
<td>.80</td>
<td>.84</td>
<td>40</td>
<td>.06</td>
</tr>
<tr>
<td>3</td>
<td>-9262.69</td>
<td>18972.04</td>
<td>241.88</td>
<td>.73</td>
<td>.76</td>
<td>64</td>
<td>.11</td>
</tr>
<tr>
<td>4</td>
<td>-9136.61</td>
<td>18887.39</td>
<td>84.65</td>
<td>.71</td>
<td>.78</td>
<td>88</td>
<td>.14</td>
</tr>
<tr>
<td>5</td>
<td>-9034.96</td>
<td>18851.58</td>
<td>35.81</td>
<td>.71</td>
<td>.78</td>
<td>112</td>
<td>.15</td>
</tr>
<tr>
<td>6</td>
<td>-8549.71</td>
<td>18048.59</td>
<td>802.99</td>
<td>.78</td>
<td>.83</td>
<td>136</td>
<td>.12</td>
</tr>
<tr>
<td>7</td>
<td>-8884.96</td>
<td>18886.58</td>
<td>-837.98</td>
<td>.73</td>
<td>.79</td>
<td>160</td>
<td>.14</td>
</tr>
</tbody>
</table>
The fifth group showed positive influence on hedonic/sensitive seeking, information seeking, eco seeking, and symbolic seeking. Especially, this group particularly showed higher scores on eco seeking and symbolic seeking than other groups. This group considered clothing shopping as pleasure behavior to release the stress and refresh themselves and this group preferred to purchase environmental friendly product and premium fashion products at the same time. They also carefully considered when searching the information for possibly expected brands before they purchase clothing as well as fashion products. Therefore, this group named as ‘group of utility/goal oriented male consumer’.

The sixth group showed negative influence on all fashion shopping behavior factors and consisted of being more males than females. This group had a native attitude on clothing and fashion products shopping behavior as well as they did not prefer purchase the latest fashion products. In addition, they particularly had the strongest negative influence on hedonic/sensitive seeking. Therefore, this group was consumers with utilitarian shopping of fashion products and purchased fashion products for needs and goals. For that reason, we named this group as ‘group of utility/goal oriented male consumer’.

The result of market segmentation for clothing shoppers using Mixture-model in the stepwise analysis approach, there was no significant result if inserting only one variable for a market segment analysis. As a result of previous qualitative research shown above, there were many limitations for comprehending substantive consumers to usage of only one criteria variable in fashion industry. Accordingly, this study simultaneously inserted the most basic variable of demographic variables that are relative with shopping behavior.

### Table 6. Stage 4: Coefficients and Wald statistics of fashion shopping behavior according to subdivision market (covariate: sex, age, income)

<table>
<thead>
<tr>
<th></th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Segment 4</th>
<th>Segment 5</th>
<th>Segment 6</th>
<th>Wald coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>24.1%</td>
<td>19.7%</td>
<td>16.3%</td>
<td>16.1%</td>
<td>13.3%</td>
<td>10.5%</td>
<td></td>
</tr>
<tr>
<td>Hedonic/Sensitive Seeking</td>
<td>0.23***</td>
<td>-0.61***</td>
<td>-0.44***</td>
<td>1.01***</td>
<td>0.36***</td>
<td>-1.45***</td>
<td>16.46.92***</td>
</tr>
<tr>
<td>Personalized Seeking</td>
<td>0.06</td>
<td>-0.31***</td>
<td>0.06</td>
<td>0.48***</td>
<td>-0.02</td>
<td>-2.78***</td>
<td>182.80***</td>
</tr>
<tr>
<td>Information Seeking</td>
<td>-0.18***</td>
<td>-0.32***</td>
<td>-0.09</td>
<td>0.80***</td>
<td>0.34***</td>
<td>-0.92***</td>
<td>415.33***</td>
</tr>
<tr>
<td>Eco Seeking</td>
<td>0.14**</td>
<td>-0.06</td>
<td>-0.19**</td>
<td>0.38***</td>
<td>0.31**</td>
<td>-0.58***</td>
<td>117.42***</td>
</tr>
<tr>
<td>Innovative Seeking</td>
<td>0.13**</td>
<td>-0.45***</td>
<td>0.11</td>
<td>0.90***</td>
<td>0.15**</td>
<td>-0.84***</td>
<td>473.94***</td>
</tr>
<tr>
<td>Price Seeking</td>
<td>-0.02</td>
<td>-0.22***</td>
<td>0.03</td>
<td>0.34***</td>
<td>0.09</td>
<td>-0.21**</td>
<td>69.58***</td>
</tr>
<tr>
<td>Brand Seeking</td>
<td>0.06***</td>
<td>-0.37***</td>
<td>-0.68***</td>
<td>0.55***</td>
<td>0.06</td>
<td>-0.43***</td>
<td>1666.04***</td>
</tr>
<tr>
<td>Symbolic Seeking</td>
<td>0.20***</td>
<td>-0.27***</td>
<td>-0.25***</td>
<td>0.53***</td>
<td>0.33***</td>
<td>-0.63***</td>
<td>893.48***</td>
</tr>
<tr>
<td><strong>Sex</strong> (covariate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>106.06***</td>
</tr>
<tr>
<td>Male</td>
<td>0.25</td>
<td>0.30</td>
<td>0.04</td>
<td>0.10</td>
<td>0.12</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.24</td>
<td>0.10</td>
<td>0.27</td>
<td>0.21</td>
<td>0.15</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong> (covariate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31.07**</td>
</tr>
<tr>
<td>20-24</td>
<td>0.20</td>
<td>0.13</td>
<td>0.27</td>
<td>0.21</td>
<td>0.13</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>0.22</td>
<td>0.20</td>
<td>0.18</td>
<td>0.20</td>
<td>0.10</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>0.28</td>
<td>0.15</td>
<td>0.18</td>
<td>0.12</td>
<td>0.17</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>0.26</td>
<td>0.31</td>
<td>0.03</td>
<td>0.11</td>
<td>0.16</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td><strong>Income</strong> (covariate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32.60**</td>
</tr>
<tr>
<td>less than 2 million</td>
<td>0.18</td>
<td>0.21</td>
<td>0.26</td>
<td>0.11</td>
<td>0.13</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>2 million - less than 4 million</td>
<td>0.23</td>
<td>0.22</td>
<td>0.16</td>
<td>0.14</td>
<td>0.14</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>4 million - less than 6 million</td>
<td>0.28</td>
<td>0.18</td>
<td>0.14</td>
<td>0.16</td>
<td>0.14</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>More than 6 million</td>
<td>0.29</td>
<td>0.10</td>
<td>0.08</td>
<td>0.32</td>
<td>0.10</td>
<td>0.11</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, ***p<0.001

Probability of each segmented group to be included in a group as covariates (sex, age, income)

Gray highlight: The most significant differences between segmented groups
on clothing shoppers. 

This study had a significant for identifying an appropriate variable for segment the consumers. Thus, this study provided an effective marketing strategy that could be adapted to characteristics of each segment group that could be support the substantial fashion industry.

4. Fashion Product Purchase Behavior of Segmented Groups

In order to see market behavior differences of segmented groups various statistics were conducted. As previously examined, this process was a stage to verify the predictive validity so to support a significant on validity for the criteria variable of market segmentation and credibility for market segmentation. To investigate the additional differences in fashion products purchase behavior, this study added 6 of subdivided groups that examined on 4th stage those are named as ‘brand loyalty orientated group’, ‘group of conservative late 30s’, ‘group of pleasure-emotion early 20s’, ‘value oriented consumer with high-income group’, ‘group of eco/symbol oriented consumer’, ‘group of utility/goal oriented male consumer’.

Brand loyalty orientated group principally considered ‘convenience’, ‘store brand’, and ‘store selected criteria’ most highly. They gained information about fashion through the publications such as a fashion magazine or a general magazine as well as television. When they purchased a formal dress or luxury goods, they preferred to utilize a department store and willing to pay high price if they have a preference brand. On the other hands, when they purchased casual clothes, they preferred to utilize internet-shopping mall and pay a moderate price. They tended to spend more than 30 million won in 3 months and visited a fashion store once or twice in a month. Group of conservative late 30s most importantly considered ‘convenience’ out of store selected criteria. Most of them earned fashion information from their family and colleagues or on the internet. They were influenced by gaining information from the internet. This group tended to spend less than 30 million won in approximately 3 months and visited a fashion store once or twice in a month. Because of this group was not interested in shopping for fashion goods, the rate of spend time in fashion store and the number of discover the fashion store was low level.

Group of pleasure-emotion early 20s mostly considered ‘convenience’ and ‘price’ for store selected criteria. The result showed that they tended to earn fashion information from the store display. Furthermore, they were not willing to pay high price when they purchase a formal wear and luxury goods and their major usage store is outlet/brand factory store or on the internet where they can get a goods for moderate price. For such a reason, pleasure-emotion group of early 20s consumers liked to refresh themselves and release their stress through the clothing shopping but they were not willing to spend certain amount of money to purchase clothes.

Value oriented consumer with high-income group most considered ‘merchandise of various’ and ‘price’ for store selection criteria. They practically and diversely utilized fashion sources such as internet/TV/fashion magazine/general magazine/fashion show/exhibition. They are willing to pay less than 20 million won for formal wear and about 20 million won for luxury goods. Even though this segment was highly interested in fashion, they were sensitive with price. They liked to utilize a department store if they purchase formal wear and luxury goods. They also liked to use internet shopping malls when they purchase casual wear. This group expressed considerable ambivalence for the propensity to consume. This group often visited the fashion store and tended to make a purchase twice or three times a month. When this high-involved fashion product with high-income group did the fashion shopping, they looked around a large number of stores because they tended to carefully consider all different ways.

Group of eco/symbol oriented consumer was important to consider ‘convenience’ for store selected criteria and consumption group of actively searching fashion information. This group thought the value of the product after the purchasing very seriously therefore they tended to pay high price for fashion products of formal wear and luxury goods and tend to go to department store. They spent less than 40 million won to 80 million won which is very high in approximately 3 months. In
order to make careful purchasing decision they tended to stay a large amount of time in the fashion store.

Group of utility/goal oriented male consumer was important to consider ‘merchandise of various’ and ‘price’ for store selected criteria and tendency of gaining fashion information from the fashion magazine and on the internet. When examined the characteristic of the subdivided group, they did not seem to purchase any fashion products however, actual consumers in this group often visited and made a purchasing a fashion store, moreover, this group’s clothing expense rate was the highest. Group of unpremeditated anti-fashion tended to comprehend a concentrate purchasing behavior instead of unconditionally regarding for a fashion shopping negatively. Therefore, we should observe this group more closely since consumers of this segment group can affect an actual sales growth.

The result of stepwise analysis on market segmentation using Mixture-model, there was no significant result when inserting only one variable for market segmentation. When comprehending consumers in substantive fashion industry, a study should be consistently implemented by inserting a combination of various variables in order to present a marketing strategy for an effective and a differentiated each segment groups.

This study attempted to find a significant variable that explains subdivided groups and this study also revealed concrete differences of fashion products purchasing behavior due to conduct market segmentation for clothing shoppers using Mixture-model. Because of understanding the characteristics of subdivided groups in depth, consumer segmentation of fashion market analysis will be most important date for consumers to perceive knowledge about differentiated marketing strategy.

V. Conclusions and Implications

This study was an attempt to implement the Mixture-model for the fashion market. Compared to a conventional cluster analysis, this technique has advantages of including a variety of variables simultaneously for market segmentation and assessing the significance of the group differences.

The initial results of the study using one variable group showed no significant differences across consumers. This indicated that the conventional one variable cluster analysis is not likely to explain segmented fashion consumers well. The ideal market segmentation process using the stepwise method of the Mixture model identified six consumer groups: the ‘brand loyalty orientated group’, ‘group of conservative late 30s’, ‘group of pleasure-emotion early 20s’, ‘value oriented consumer product with high-income group’, ‘group of eco/symbol oriented consumer’, and ‘group of utility/goal oriented male consumers’. Several fashion shopping behavior variables of the consumer’s sex, age, and income, as a covariate, were included in the final segmentation. The results indicated that when segmenting the fashion market, the Mixture model can be applied.

This study implemented market segmentation after investigating the consumers established purchasing situation on clothing and fashion products. However, the fashion industry separately analyzes market segments for every brand and product to implement a marketing strategy. Future studies should be performed for consumers’ segmentation on the basis of specific fashion product situations, such as types and brands of every fashion product, so the fashion industry can increase the utilization of the Mixture-model for market segmentation. Also, this study conducted market segmentation using the Mixture-model emphasized on 20s and 30s consumers. Future studies have to include a broader age group for understanding all segment groups. Based on these results, when establishing a marketing strategy for a subdivided group, we expect to extensively utilize the Mixture-model to contribute to the understanding of clothing shopper’s segment groups in the fashion industry.

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