

Measuring Importance of Online Apparel Stores' Design Attributes Using Three Different Methods

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Abstract

Due to the virtual nature of online businesses, online apparel stores need to enhance the consumer experience by utilizing store design attributes to provide their customers relevant and sufficient information. Since online apparel stores mainly communicate with their customers virtually and digitally, it is important to understand how consumers perceive and react to different design attributes commonly found on apparel stores' online websites. The purpose of this paper is to examine the importance of design attributes commonly found on online apparel stores' websites using three different importance measurements. The design attributes examined in this study include enlarged pictures, product detail pictures, product reviews by other buyers, coordinating items, and size measurement charts. The three different measurements used in this study include two direct measures and one indirect measure using conjoint analysis. Across the three different measures, both the men and women indicated that enlarged pictures represent the most important design attribute when they purchase clothes online followed by size measurement charts and they considered the availability of coordinating items the least important design attribute.

Keywords : importance measure, rating–scale measure, first–choice measure, conjoint analysis

1. Introduction

In Korea, online retailing has been steadily growing. Spending on clothes and fashion related

goods was approximately 6.5 billion US dollars in 2014, the second largest spending category following travel arrangement and reservation services, and it is expected to grow to 47.82

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billion US dollars in 2018 (www.statista.com). Trying on apparel to examine the fit, feel, color, and texture is important to the consumer decision-making process. However, since consumers' experience with clothing is very limited in the online shopping environment, online apparel stores need to enhance the consumer experience by utilizing website design attributes to provide their customers relevant and sufficient information. Since online apparel stores mainly communicate with their customers virtually and digitally, it is important to understand how consumers perceive and react to different design attributes commonly found on apparel stores' websites. As online apparel shopping has become more prevalent, measuring perceptions of online apparel store attributes as they are related to consumer satisfaction and shopping behavior has also drawn a great deal of attention in both academia and marketing research (Kim & Lennon, 2008; Kwon, Joshi, & Jackson, 2006; McKinney, 2004; Siddiqui, O'Malley, McColl, & Birtwistle, 2003; Seock & Chen-Yu, 2007; Seock & Norton, 2006; Tractinsky & Lowengart, 2007).

There are various measures determining the importance of attributes in consumer decision-making including importance ratings, point-allocation, constant sum, Q-sort, maximum different scaling, conjoint analysis, analytical-hierarchy process, unbounded ratings, magnitude estimation, derived importance measures, etc. (Barlas, 2003; Chrzen & Golovashkina, 2006; Fontenot, Henke, Carson, & Carson, 2007; Ittersum, Pennings, Wansink, & Trijp, 2004). Among the available importance measures, the three most commonly used measures were used in this study to examine the importance of online apparel stores' design attributes. The effectiveness of visual

merchandising and the attractiveness of website design may have a significant effect on online shoppers' web-browsing behavior. Although researchers have attempted to measure the effectiveness of online shopping sites' design attributes as they are related to web-surfing behavior, information searches, buying intentions, and consumer satisfaction, no attempt has been made to investigate the importance of design attributes using multiple measures. In order to improve the effectiveness of website design, online apparel companies need to understand how consumers perceive different design attributes.

The purpose of this paper is to examine the importance of design attributes commonly found on online apparel stores' websites using three different importance measurements. The design attributes examined in this study include enlarged pictures, product detail pictures, product reviews by other buyers, coordinating items, and size measurement charts. The three different measurements used in this study include two direct measures and one indirect measure using conjoint analysis. The first direct measure uses a scale asking how important each attribute is, and the second direct measure asks respondents to choose the most important attribute out of the five design attributes. Conjoint analysis as an indirect measure was used to measure the relative importance of the online apparel stores' design attributes.

II. Literature Review

This article relates to three strands of literature: design attributes of online apparel stores, importance measures, and research that compares different measures.

1. Apparel Online Store Website Attributes

Creating and developing an interactive, user-friendly, and esthetically pleasing online store website is crucial to the success of an e-commerce business. According to Tractinsky and Lowengart's (2007) study on the importance of esthetic design in web-based stores, the esthetic design of web stores does influence consumers' decision processes and their attitudes toward stores. Similarly, Ha, Kwon, and Lennon (2007) reported that online retailers have implemented most of the visual merchandising features and elements of offline retail stores with some modifications to fit the online environment. They also noted that due to the inability to try on apparel products online, online product presentation affects consumers who are browsing and considering purchasing online.

In a study investigating how visual (picture) and verbal (text) presentation formats influence consumer decision-making in online shopping, Kim and Lennon (2008) reported that visual and verbal information significantly affects consumer attitudes and verbal information affect purchase intentions. They also suggested that more detailed verbal descriptions of products positively influence consumer purchase decisions. Siddiqui, O'Malley, McColl, and Birtwistle (2003) examined how fashion retailers and consumers perceived fashion websites differently. The results showed that fashion retailers tend to utilize websites mainly as communication channels and often fail to add value to their brand and to create exciting online offers. They also showed that consumers consider the replication of the store format boring and are often disappointed by the low level of interactivity presented by the websites suggesting that online shoppers are looking for a more engaging and memorable

online experience.

McKinney (2004) reported that across all five Internet shopping orientation segments, a set of atmospheric variables contributes to consumer satisfaction experienced at Internet shopping sites. This includes links to special offers/coupons, product descriptions, graphics/photos/images, merchandise prices, total basket cost, option to delete previously selected item, help service/toll-free customer service number, and order confirmation via email. In this study, respondents were asked to indicate which atmospheric variables contributed to their satisfaction with the Internet shopping sites at which they had made their last purchases. They did so by responding "Yes" to variables that contributed to satisfaction, "No" to variables that did not contribute to satisfaction, and "Not applicable" to variables that were not available at the shopping sites from which they had made purchases. The research compiled 36 atmospheric variables by conducting a content analysis of features offered on specialty, discount, and department store Internet shopping sites due to the lack of previous literature in this field.

Kwon et al., (2006) identified demographic variables affecting Korean consumers' perceptions of fashion website attributes. In their study, principal component factor analysis with Varimax rotation was used to calculate the perceived importance of attributes found in fashion brand websites. These included commerce (variety of payment methods, secure transactions, easy returns/refunds), customization (point crediting systems, ID/password reminder system, easy membership application process), content (website design, multimedia capability, inviting homepage), community (availability of online community, online chatting, online forum),

connection (advertising on other website, links with fashion-related associations), and communication (speedy replies, one-on-one Q&A service, newsletters/polling options). They reported that female shoppers considered commerce, customization, content, connection, and communication attributes to be more important for a fashion website than male shoppers did. They also reported that older shoppers (40 years and older) considered community the most important fashion website attribute, high school graduates considered content more important than those with college-level education, and higher-income shoppers considered commerce and content attributes more important than lower-income shoppers.

Based on the previous research exploring the environmental and design features of online stores and their relationships to consumer purchasing behavior and satisfaction, the relative importance of different design elements of online stores was examined in this study.

2. Importance Measures

Scholars and practitioners in marketing research use various measures to identify attribute importance in consumer perceptions and decision-making. Ittersum, et al. (2004) compared 12 methods to provide a framework for convergent validity of these measures. These included following: 1) direct-rating method, 2) direct-ranking method, 3) point-allocation method, 4) analytical hierarchy process, 5) means-end chain method, 6) multi-attribute model, 7) trade-off method, 8) swing-weight method, 9) free-elicitation method, 10) conjoint method, 11) information display board, and 12) use of verbal protocols. Through a thorough

review of research done in various fields, they concluded that there is convergent and nomological validity of methods that identify the same dimensions of attribute importance while discriminant validity between methods also exists, suggesting that taking a multidimensional approach to attribute importance may improve the validity of these measures. Similarly, Chrzan and Golovashkina (2006) compared six stated attribute importance methods, including importance ratings, constant sum, Q-sort, maximum difference scaling, unbounded ratings, and magnitude estimation in a web-based commercial customer satisfaction study.

Fontenot et al. (2007) examined the importance of attributes affecting customer satisfaction by using one stated importance method and three derived importance methods. In their study, respondents rated the importance of 41 attributes using a seven-point scale where "1" was "not important at all" and "7" was "very important". After reducing the attributes to five factors by using principal component factor analysis with VARIMAX rotation, derived importance was calculated using Pearson correlation, beta weights from regression analysis, and the product of the beta weight and Pearson correlation with overall satisfaction as a dependent variable. They concluded that rating-scale measures of stated importance may not be useful due to the low discrimination among the attributes, and they suggested that other measures of stated importance, such as rankings or constant sum measures, should be examined in future research. They also found that even though the derived importance measures produced more sensitive, variable importance scores, the results from the three methods were inconsistent, which makes it difficult for researchers to determine where to

focus their efforts to improve overall satisfaction.

Gustafsson and Johnson (2009) examined five statistically derived importance measures for determining importance in a service quality and satisfaction model including multiple regression, normalized pairwise estimation, partial least squares with reflective attribute specifications, partial least squares with formative attribute specifications, and a variation on principal components regression. They compared the results of statistically derived importance measures to direct ratings of attribute importance and concluded that all methods have strengths and weaknesses

Researchers in both academia and commercial marketing research use various methods to determine the importance of attributes in consumer decision-making processes. Given the number of studies pertaining to consumer decision making in the field of fashion marketing, very little research has been done to compare the various importance measures in one study to understand which measures are the better measures of importance.

3. Research that Compares Different Measures

One of the problems posed in the analysis of research results is the possibility for the occurrence of differences according to the methods used for the measurement of conceptual definitions. Therefore, an investigation on whether there is any difference among diverse measuring methods should be done first. Methods for measuring importance are largely divided into those using single item and those using multiple items. Those using a single item divide customers' perception of importance into several intervals between "very

important" and "not important at all", and obtain responses. Although respondents can easily give responses using this method, measuring methods using a single item cannot fully explain the reason behind the importance perceived by the respondent. In their study, Gardner, Cumming, Dunham, and Pierce (1998) compared multiple-item to single-item measures of the same construct and found that neither method was empirically better than the other and that the traditional multiple-item scales did not outperform the nontraditional single-item. (Gardner et al., 1998).

In addition, the measuring methods can be divided into direct and indirect measuring methods according to the type of measurement. Peter, Churchill, and Brown (1993) noted that direct measuring methods can clearly reflect respondents' psychological characteristics. Accordingly, a five- to seven-point scale is often used to evaluate importance according to the attributes of a product or service. Studies conducted in Korea, such as Kim (2007), Chung and Park (2010), and Park (2000) also used a five- or seven-point scale to measure the importance of website menus or attributes. Ahn, Lim, and Kim (2000) investigated whether methods for measuring satisfaction had effects on the predictability of customer satisfaction for repurchase intention. As a result of examining the correlation between car insurance buyers' customer satisfaction and repurchase intentions, it was found that a customer satisfaction measuring model that used a five-point scale and a single item showed the highest correlation between customer satisfaction and repurchase intentions.

Hardisty, Thompson, Krantz, and Weber, (2013), examined time preference for financial gains and losses using three different measures:

matching, fixed-sequence choice titration, and a dynamic staircase choice method. They noted that performance of different measures need to be evaluated based on the goal of the research project. They recommended If the goal is to predict real-world behavior and outcomes, choice-based methods should be used, whereas if the goal is to minimize experimental demand effects, or secure a good model fit, matching should be used.

Ahn, Lim, and Park (2006) compared the predictability of diverse conjoint analyses in general hospital choice. They used four models of traditional conjoint analysis and choice-based conjoint analysis. In general, the traditional and choice-based conjoint analysis models were similar in terms of utility estimates. They found that the hybrid conjoint analysis that combines the traditional and choice-based conjoint analysis showed the highest prediction. Kalish and Nelson (1991) compared the traditional preference measures of ranking and rating in conjoint analysis with a direct monetary measure of product value, which was reservation prices in the study. They examined the consumers' willingness to pay reservation price for a product as depending on the product's attribute level (exclusive of price) and base choice on the difference between the purchase price and the consumer's reservation price for the product. Three measurement method in conjoint analysis were used in this study: 1) rank-responses were asked to rank the products from most preferred to least preferred, 2) rating-rating were measured on a scale of 1 to 100 point, and 3) reservation price-responses was asked to indicate what sum of money would make them indifferent between the product and the money. They found that reservation prices do very well in terms of fit and little difference is found in

the performance of ranks and ratings.

This study intends to apply to the same sample a variety of methods for measuring the importance of website attributes and to examine whether there is any difference among the measuring methods by comparing the findings.

III. Methods

1. Sample

A self-administered online survey was used as the primary means for data collection. A total of 500 consumers who had purchased personal products online were recruited from a list of online purchasers. Among them, 300 consumers (150 male and 150 female) who had shopped for apparel items online more than once in the last 12 months were chosen for the study. The ages of the participants ranged from 16 to 69 with an average age of 32.6 years. Approximately 79% of the sample fell in the age range of 25 to 45, while those older than 30 accounted for 60%. The majority of the sample had completed a two-year college program or other type of higher education (N = 210, 70%).

The number of apparel purchases done in the past 12 months ranged from 1 to 30 with an average of four times a year. The amount of money spent on apparel shopping for the last 12 months ranged from 70,000 Korean won to 2,500,000 won with an average of 210,000 won. The clothing items purchased were t-shirts or shirts (60.7%), pants (50.7%), shoes (33.0%), sportswear (25.7%), jackets/coats (26.0%), underwear (23.3%), skirts/dresses (18.7%), and suits (9.0%). The average unit price of clothing items purchased was between 10,000 and

29,900 won (40.7%) followed by between 30,000 and 49,000 won (37.0%).

2. Instrument

The online survey questionnaire consisted of four sections that included three different types of importance measures and demographics. The researchers completed a content analysis on the existing apparel shopping websites and selected the most common design features found on online apparel sites in the Korean market including availability of enlarged pictures, product detail pictures, other buyers' product reviews and comments, coordinating items, size measurement charts, various product presentation formats, price promotion information, and product descriptions. Among the common design features found on apparel shopping websites, the five design attributes examined in this study were as follows: availability of enlarged pictures, product detail pictures, other buyers' product reviews, coordinating items, and size measurement charts.

A content analysis was done on the various importance measures commonly adopted in marketing research projects by a marketing research company, which yielded the three importance measures included in this study. The respondents were asked to rate the importance of each design attribute when shopping for apparel products on a nine-point scale (1="definitely not important," 9="extremely important"). The next measure asked the respondents to choose the most important attributes out of the five design attributes. These two measures are direct importance measures. In this study, the first measure refers to the rating-scale importance measure, while the

second refers to the first-choice measure.

As an indirect measurement, a paired-comparison conjoint analysis was used to measure the relative importance of the design attributes. Conjoint analysis is a marketing research analysis technique that measures consumers' overall preferences for services, ideas, or products and evaluates the relative importance of each attribute. Thus, it can predict whether a product will actually be selected by consumers. Hence, it is an analysis technique that can be widely used in the development of new products; the determination of product attributes and their levels through positioning; the analysis of competition structure, pricing, and market segmentation; the prediction of market share and sales; and so on (Ahn, Lim, & Park, 2006; Green & Srinivasan, 1990; Orme, 2005). The Conjoint Value Analysis (CVA) package from Sawtooth Software was used to generate 18-paired profiles with an orthogonal design. The five design features were fed into the conjoint design as attributes. Each attributes had two levels: available and not available on the shopping website. The respondents were asked to rate their preferences between two sets of apparel shopping site profiles (see Figure 1). The demographic questions included age, income, gender, education level, and occupation.

IV. Results

1. Rating-Scale Importance Measure Results

The results of the rating-scale importance measure showed relatively high scores with little differentiation among absolute ratings on the

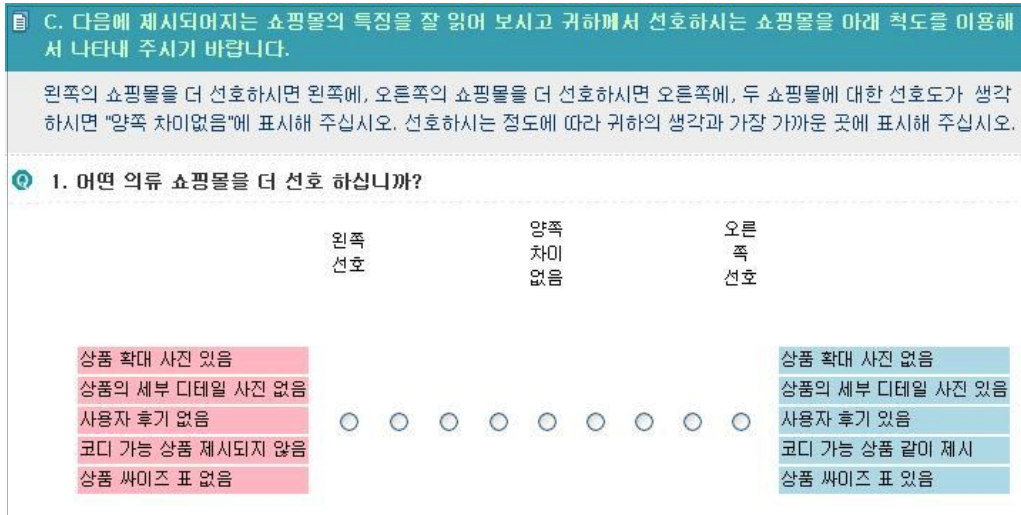


Figure 1. Paired-Comparison Conjoint Profile

Table 1. The Results of the Single Rating-scale Importance Method

Design attributes	Stated importance on a 9-point scale		
	All (N = 300)	Men (n = 150)	Women (n = 150)
	M(SD)	M(SD)	M(SD)
Enlarged pictures	7.99 (1.57)	7.78 (1.73)	8.21 (1.38)
Product detail pictures	7.90 (1.52)	7.72 (1.62)	8.07 (1.40)
Other buyer's reviews	7.14 (1.95)	6.89 (1.97)	7.39 (1.91)
Coordinating items	6.28 (1.95)	6.09 (1.92)	6.48 (1.96)
Size measurement charts	7.95 (1.46)	7.76 (1.57)	8.14 (1.32)

design attributes (see Table 1). The respondents indicated that each design attribute was important when they shopped for apparel items through Internet stores. Given that a rating of five is considered to reflect average importance on a nine-point scale, respondents rated all features as important to their decisions. While men and women rated the importance of the design features in the same order, women tended to rate all the design features higher than men did (see Table 1). Even though both male and female respondents agreed that the

availability of enlarged pictures was the most important design attribute and the availability of coordinating items was the least important, the respondents tended to rate all design attributes as important to their purchase decisions. ANOVA results showed that there were significant differences in importance responses by gender: enlarged picture ($p=.019$), product detail pictures ($p=.044$), other buyer's reviews ($p=.028$), and size measurement charts ($p=.024$). Even though both male and female respondents agreed that the availability of enlarged pictures was the most

important design attribute and the availability of coordinating items was the least important, the respondents tended to rate all design attributes as important to their purchase decisions.

2. First-Choice Measure Results

Crosstab analysis was used to examine first-choice measures and the result showed a marginal difference between the most important and the second most important attribute in both male and female respondents (see Table 2). The availability of coordinating items was chosen as least important attribute with a significant gap from the next least important attribute. Of all respondents, 37.3% chose the availability of enlarged pictures as the most important attribute followed by size measurement charts, other buyers' reviews, product detail pictures, and coordinating items. The males rated other buyers' reviews more important than product detail pictures, while females rated product detail pictures as more important than other buyers' reviews. The result of the Chi-square analysis ($p=.782$) revealed that there was no relationship between design attributes and gender.

3. Conjoint Analysis Results

Internet site design attributes have been found

to be influential in affecting Internet users' behavior (Gorn, Chattopadhyay, Sengupta, & Tripathi, 2004; Son & Lim, 2001). Since Internet stores mainly communicate with their customers via computer screens, it is very important to examine how consumers perceive and react to store designs. In order to fully utilize the potential of store design, Internet marketers need to identify those attributes that are relatively more important than others. The results of a conjoint analysis based on data collected from the questionnaire survey show preferences for each service quality condition profile, and the importance of attributes and their levels by estimating the part-worths of each attribute and its levels (Orme, 2005).

The results of the conjoint analysis showed similar results (see Table 3). The sum of the importance scores of all design attributes is 100%. A paired comparison conjoint analysis identified that the availability of enlarged pictures (26.96%) had the highest relative importance, followed by the availability of size measurement charts (25.33%), the other customers' reviews on the products (20.06%), product detail pictures (17.06%), coordinating items on the website (10.59%). Since respondents placed more importance on enlarged pictures and size measurement charts, these attributes should be available in apparel Internet stores. However, the

Table 2. The Results of the First-Choice Method

Design attributes	First-choice method		
	All ($N = 300$)	Men ($n = 150$)	Women ($n = 150$)
Enlarged pictures	37.3%	36.0%	38.7%
Product detail pictures	18.7%	17.3%	20.0%
Other buyer's reviews	19.0%	20.0%	18.0%
Coordinating items	4.7%	6.0%	3.3%
Size measurement charts	20.3%	20.7%	20.0%

Table 3. The Results of the Conjoint Method

Design attributes	Relative importance (%)		
	All (<i>N</i> = 300)	Men (<i>n</i> = 150)	Women (<i>n</i> = 150)
Enlarged pictures	26.96	25.80	28.12
Product detail pictures	17.06	17.96	16.16
Other buyer's reviews	20.06	19.99	20.12
Coordinating items	10.59	10.64	10.54
Size measurement charts	25.33	25.61	25.05

results could differ if they were analyzed according to customers' characteristics. For example, as presented in the Table 3, in the case of males, enlarged pictures (25.80%) and size measurement charts (25.61%) showed very similar importance, whereas in the case of females, their rating of enlarged pictures (28.12%) shows that women consider enlarged picture more important than other attributes.

V. Discussion and Conclusions

The purpose of this paper was to examine the importance consumers place on design attributes when they shop for clothing online using three different importance measures. The design attributes examined in this study were availability of enlarged pictures, product detail pictures, other buyers' reviews of the products, coordinating items, and size measurement charts. The three different methods used in this study were two direct measures and one indirect importance measure. Across the three different measures, all five website product design attributes were rated "important" in general. Both the males and females indicated that the availability of enlarged pictures was the most important design attribute when they purchased clothes online followed by the availability of size

measurements charts. They considered the availability of coordinating items least important in their online shopping behavior. The results from the first-choice measure and the conjoint measure were identical. The results of both measures showed that buyers' reviews are more important than product detail pictures; however, the result of the rating-scale importance measure was the opposite. The male and female respondents' preferences for the design attributes agreed regardless of the different importance measures, except the female respondents place more importance on product detail pictures than other buyers' reviews on the first-choice importance measure. On the first-choice measure, women considered product detail pictures as important as size charts, both of which followed enlarged pictures.

While the rating-scale importance measure is often used in academic and commercial marketing research, respondents' ratings on this measure showed little differentiation among the five design attributes. The face value of the importance on this rating-scale measure indicates that the respondents considered all design attributes important since their scores ranged from 6.28 to 7.99 on the nine-point scale measure, resulting in poor discrimination. Oftentimes, researchers standardize raw scores from rating-scale measurements to compare

them to the group mean and use the standardized scores in any further statistical analysis. The first-choice measure can be considered convenient since respondents simply choose the one that they consider most important. However, the use of the results from this measure can be limited since it only generates binary data. The conjoint measure as an indirect importance measure provided continuous data that could be used in either parametric or linear statistical analysis.

Various methods for measuring website importance were comparatively analyzed in this study. However, it is difficult to generalize the findings obtained from the application to one type of site (i.e., online fashion store), and thus, additional analyses on diverse products and services are required. In addition, it would also be meaningful to comparatively evaluate the predictability of variables other than importance, for instance, customer satisfaction. In addition, there may be differences according to respondents' characteristics (i.e., product involvement or product knowledge), and thus, it will also be necessary to include more respondents' related variables.

In this study, even though no statistical method was included, which limits the application of this result to be generalized, the findings suggest that each of the three importance measures has both strengths and weaknesses and it is necessary to choose a measure that is compatible with the research context and the intended use of the data produced. Even though all five design features were considered important, understanding the hierarchy of importance that customers place on the design features of websites while shopping for clothes online will help online retailers set priority for improving visual presentation of

products and enhancing the existing features to embracing online shoppers' unsought needs.

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