AN ABSTRACT OF THE DISSERTATION OF

Jungmin Yoo for the degree of Doctor of Philosophy in Design and Human Environment presented on April 29, 2010.
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Abstract approved:

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Minjeong Kim Leslie D. Burns

The purpose of the study was to investigate practical guidelines based on empirical evidence for effective website design, including both home page and product pages. This research consists of two consecutive empirical studies. Study 1 was one factor (home page design: image- vs. text-oriented home page) between-subjects design with two moderators: brand familiarity and centrality of visual product aesthetics (CVPA) and examined (1) effects of home page design on consumer responses, (2) effects of home page design on consumer responses as a function of individual differences, such as brand familiarity and CVPA.

The design of the study 2 was a 2 (visual information: product image with a concrete background vs. product image with a solid white background) x 2 (verbal information: presence vs. absence of concrete descriptions) between-subjects factorial design. Study 2 examined (1) effects of imagery-evoking product presentation on mental imagery, (2) to examine how individual difference in terms of style of processing (SOP)

affects the way product presentation influences mental imagery, and (3) to assess how mental imagery influences other consumer responses.

Online experiment was conducted using mock apparel websites for both studies. The findings from study 1 revealed: (1) an image-oriented home page design was more effective in enhancing visual fluency and perceived aesthetics of a home page; (2) people in both high and low CVPA groups preferred an image-oriented home page to a text-oriented home page.

The findings from study 2 revealed: (1) effectiveness of visual information in apparel websites depends on the presence of concrete and relevant background of a product image in terms of its ability to evoke elaborate mental imagery; (2) interaction effects of visual information by verbal information were significantly different between visualizers and verbalizers.

The findings of both studies provide theoretical and practical implications: (1) the results provide theoretical insight to understand the effects of website design on consumer responses from the perspective of the Stimulus-Organism-Response model and dual coding theory; and (2) the empirical evidence of the effectiveness of image-oriented home page and the effects of imagery-evoking product presentation on consumer responses provides valuable marketing strategies for apparel online retailers.

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Developing Effective Presentation Strategies for Online Retailers

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Jungmin Yoo

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Jungmin Yoo, Author

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Developing Effective Presentation Strategies for Online Retailers

CHAPTER 1

INTRODUCTION

Overview

The Internet has grown substantially during the last decade alongside the growing efficiency of new technological developments, and online retail markets have rapidly grown during the same period. Thus, shopping has become a dominant part of Internet usage. Estimated US e-commerce sales revenue reached $165.9 billion in 2007, an increase of 21.8% from 2006 (Internet Retailer, 2008). Product categories frequently sold through the Internet include CDs, books, computer hardware and software, toys and electronics. In more recent years, the market has expanded to include apparel and jewelry which were purchased only in brick-and-mortar stores in the past (Chain Store Age, 1999). According to the US Commerce Department, online retail sales are growing four times faster than offline retail sales (The Columbus Dispatch, 2006). Apparel was the third largest category of online shopping sales in 2001 (Marketwire, 2002) and the second most profitable product category in 2005 (Auchard, 2005). Online sales during holidays are also growing every year. Online holiday shopping was $18.11 billion without travel sales in 2005, and it increased 25% over 2004 (eMarketer, 2006). In addition, apparel was the biggest category of online shopping by revenue during the holiday period in 2003 and 2004 (Internet Retailer, 2005a). Consumers spent $3.8 billion on apparel from November

to the second week in December in 2004, which was 16% of the total online revenue. eMarketer (2006) also reported sales revenue during the holiday period in 2005, where online shoppers spent the most on apparel items, at $5.3 billion, a 43% increase from 2004. Because of the many conveniences of online shopping, such as time saved and unlimited accessibility (Then & Delong, 1999), more and more consumers have adopted the online medium for apparel shopping. The possibility of growing online retail sales is very high, and the growth of online retail sales is expected to continue (eMarketer, 2004).

However, more than a quarter of online shoppers still do not buy online due to the inability to physically examine an item prior to purchase (Internet Retailer, 2005b). In order to compensate for this disadvantage of online shopping, many researchers have highlighted the importance of atmospherics on websites. Atmospherics is defined as "the conscious designing of space to create certain effects in buyers, specifically, the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (Kotler, 1973-1974, p. 50). Much past research has noted that elements of the store environment such as lighting, music, color, smell, and store layout play an important role in a consumer's attitude toward and intent to purchase (Kotler, 1973-1974; Turley & Milliman, 2000). Recently, the importance of online atmospherics in an online context has received growing attention as a way to affect a consumer's purchase behavior, and researchers have begun to examine the effect of atmospherics on online shopping (Eroglu, Machleit, & Davis, 2001, 2003). According to Eroglu et al. (2001), online atmospherics, such as colors, graphics, layout, and design, can convey certain impressions about the online shop, and then influence consumer

responses. Therefore, online retailers may be able to develop visual presentation that increases the consumer responses.

For the effective use of online atmospherics, website aesthetics has been emphasized by a number of researchers. The term "aesthetics" has diverse meanings depending on the domains of inquiry, but in general, "aesthetics" has been used as almost synonymous with "beauty" (Tractinsky & Lowengart, 2007). Porat and Tractinsky (2006) have found that holistic website aesthetics affect consumers' affective states, such as pleasure and arousal. Vilnai-Yavetz and Rafaeli (2006) showed positive effects of website aesthetics on consumer attitudes and satisfaction toward the retailers. Although consumers' evaluations of aesthetics occur immediately (Lindgaard, Fernandes, Dudek, & Brown, 2006), effects of website aesthetics were significant.

As another atmospheric cue, the significance of the product presentation of apparel websites was examined by researchers (Then & Delong, 1999; Kim & Lennon, 2008). For example, image size (Kim & Lennon, 2008; Park, Lennon, & Stoel, 2005) and product movements (Park et al, 2005) were found to be important in affecting consumer responses. According to Larry Freed, president and chief executive of ForeSee Results of Ann Arbor, Michigan, many online retailers have discovered various functions which help to compensate for intangibility of online shopping, such as providing more extensive product information, a 360-degree view of the product, and customer reviews. As a result, customer satisfaction with online retailers grew 1.3 percent to 81points on a 100-point scale from 2004 to 2005. Compared to the fact that customer satisfaction with the overall retailer industry dropped 0.3 percent to 72.4 points during the same period,

providing detailed verbal and visual information about the product appeared to be very important for online retailers to attract consumers and facilitate purchasing (The Columbus Dispatch, 2006).

Since the major obstacle of online shopping is the inability to inspect garments (Elkin, 2001), providing more detailed information through product presentation is critical, and mental imagery has been considered an effective strategy for intangible or experiential shopping (Schwarz, 1986). Kim and Lennon (2008) found that a large product image affects consumers' mental imagery, which in turn affects their attitudes and purchase intentions. As found in advertising research, concrete visual and verbal information influences mental imagery, which in turn affects consumers' attitudes and behavioral intentions (Babin & Burns, 1997; Miller & Stoica, 2003). In this regard, concrete visual and verbal information provided on a website may affect consumers' attitudes and behavioral intentions through mental imagery. However, people have different styles of visual and verbal information processing (Childers, Houston, & Heckler, 1985). For example, visualizers tend to obtain more information from visual images rather than verbal descriptions, whereas verbalizers more likely learn from verbal descriptions rather than images. Therefore, this study examines effects of home page designs and imagery-evoking product presentation on consumer responses in an online shopping context, and individual information processing styles are also considered.

Statement of Problem

Apparel websites can be divided into a home page and product pages. The home page may play a similar role to window displays in traditional retail stores. In traditional retailing, consumers form first impressions, and observe or infer store-related information from the window displays (Sen, Block, & Chandran, 2002). Similarly, online shoppers view a home page of a website before they enter product pages, and then they form certain impressions about the online store from the home page.

According to past research, visual images play an important role in creating positive impressions about the retailers (Tractinsky & Lowengart, 2007). Even though home pages clearly play a vital role in creating first impressions of online retailers, little scholarly attention has been given to web home pages. Therefore, it is important to investigate effects of home page design on consumer responses, such as visual fluency. When consumers easily process information presented on a home page, the home page can be considered visually fluent (Winkielman, Schwarz, Reber, & Fazendeiro, 2003), and visual fluency was found to further influence preference (Reber, Winkielman, & Schwarz, 1998) and behavioral intentions (Im & Stoel, 2007). In addition, considering that people tend to rely more on brand name in a non-store shopping context (Hoch & Ha, 1986), a better understanding of how people respond to website design as a function of brand familiarity is expected to provide practical implications for online retailers.

Once consumers form positive impressions from the home page, they are likely to explore the product pages. However, due to the inability to physically evaluate a

product prior to purchase, online shoppers have to depend on product presentation created by online retailers to make a purchase decision instead of actively seeking out information as they would at a brick-and-mortar store. Therefore, it is critical for online retailers to develop effective online product presentation to facilitate online shoppers' product evaluation in a virtual online world.

One issue is how online retailers can present their products, especially clothing, to enhance behavioral intentions. Imagery-evoking presentation of an apparel product on the website may affect consumer responses. The finding of mental imagery research in advertising (Babin & Burns, 1997), such as effects of concrete visual and verbal information on consumers' mental imagery, positive attitudes and behavioral intentions, can be applied to an online context. In spite of the significance of imagery-evoking strategies in advertising, research dealing with imagery-evoking product presentation in the online shopping environment is minimal. For example, if a t-shirt is presented on a vacation scene, then consumers can easily imagine their consumption behaviors. Similarly, if online websites provide concrete verbal information, such as "sexy t-shirt on a sunny beach, a lot of love for sun and sand," then consumers may easily imagine the situations in which the product might be consumed than they would with less concrete verbal information, such as "solid t-shirt." Mental imagery elicited from the product presentation may influence consumers' emotions related to the imagined event, cognitive states, attitudes toward the website, and behavioral intentions.

Therefore, in order to fill the gap, this research examines the way home page designs affect consumer responses. Also, effects of product presentation are examined from the perspective of mental imagery.

Purpose of the study

The primary goal of this research is to provide practical guidelines based on empirical evidence for effective website design, including both home pages and product pages. In order to move toward the primary goal, the proposed research consists of two consecutive empirical studies. The first study will focus on (1) the effects of home page design on visual fluency and perceived aesthetics, (2) the effects of home page design on consumer responses as a function of individual differences, and (3) the effects of visual fluency and perceived aesthetics on preference and behavioral intention.

The purpose of the second study is to (1) investigate effects of imagery-evoking product presentation on consumer responses, such as mental imagery, positive emotions, perceived risk, attitudes, and behavioral intentions, (2) to examine how individual differences in terms of style of processing affect the way product presentation influences mental imagery, and (3) to assess how imagery, positive emotions, perceived risk, attitudes, and behavioral intention are related each other.

Theoretical Framework

Stimulus-Organism-Response (SOR) Model

The two studies reported here use the Stimulus-Organism-Response (SOR) model (Mehrabian and Russell, 1974) as a theoretical framework. The concept of the SOR model is that environmental stimuli (S) affect individual internal states (O) such as affective states or cognitive states, which in turn affect approach/avoidance behavior (R). For example, the stimulus (S) examined by Mehrabian and Russell in physical settings was the overall environmental stimulation in terms of novelty and complexity. Turley and Milliman (2000) divided environmental stimuli into five categories: external variables (e.g., exterior signs), interior variables (lighting), store layout (e.g., floor and aisle), interior display (product display), and human variables (e.g., sales people and other customers).

SOR model explains how environmental stimuli in a store affect consumers' affective or cognitive states. Mehrabian and Russell (1974) posited that any environment produces three PAD emotions that represent clines of potentional responses: pleasure-displeasure, arousal-nonarousal, and dominance-submissiveness. These three PAD emotions are sufficient to explain the variety of a person's emotions toward environmental stimuli. In addition, the person's responses to the environment mediated by affective and cognitive states can be divided into approach and avoidance behaviors. Approach behaviors indicate a person' desire to physically stay in, browse the store, and

interact with sales people. Avoidance behaviors include a person's desire to leave the store, and avoid its sales people.

The SOR model has been widely adopted in diverse retail settings and has received much empirical support. In Donovan and Rossiter's (1982) study, store atmosphere such as novelty, variety, irregularity, density, and size of the environment affected consumers' pleasure and arousal dimensions of affective state. Also, pleasure and arousal interacted such that arousal was important for approach behaviors in a pleasant store. Arousal, an individual's excitement and alertness induced by the store, increased time spent in the store and communication with sales personnel. Another study found that an increase in pleasure and in arousal due to music, lighting, and salespeople in a store influenced purchase intention (Baker, Levy, & Grewal, 1992).

The SOR model has also been adopted in online shopping research. Due to the different nature of online shopping, environmental cues are different from a traditional retail setting. For example, consumers may not be strongly influenced by human variables, such as sales people or other customers in traditional retail stores. According to Eroglu *et al*. (2001, 2003), online store atmospherics such as pictures and verbal information (S) influence affective states (e.g., pleasure and arousal) and cognitive states (e.g., perceived risk, perceived amount of information, and perceived quality)(O), which in turn affect approach-avoidance behaviors (e.g., time spent on the website and purchase intention) and satisfaction. Their empirical findings provide support for the SOR model that online atmospherics significantly affected consumer approach-avoidance behaviors,

and affective and cognitive states mediated the relationships between online atmospherics and consumer responses (Eroglu *et al*. 2003).

Significance of the Study

This research is expected to contribute to the literature on the areas of retailing, marketing, and textiles and clothing. First of all, a number of studies have examined website design issues. Much prior research has examined home page aesthetics and showed empirical evidence of effects of home page aesthetics on users' responses. However, no research has been done in the context of apparel online shopping. If the effects of home page design on apparel shoppers are positive and significant, then the results can have practical implications for online retailers since home page design may draw more consumers to product pages. Second, once consumers enter product pages, it is critical for online retailers to make them purchase. Thus, it is important to examine consumer responses based on different product presentation strategies, such as imagery-evoking product presentation. Even though online websites play a similar role to advertising (Singh & Dalal, 1999), popular topics in advertising, such as mental imagery on consumer behaviors have not been researched in an online context. The current research examines the effects of different types of home page designs and product presentation on apparel websites. The findings of the proposed research are expected to add to the growing body of online retailing literature and further provide practical

implications for online retailers to develop more effective websites including home pages and product pages.

Definition of Terms

Terms used in this study are defined as follows:

Atmospherics: "the conscious designing of space to create certain effects in buyers, specifically, the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (Kotler, 1973-1974, p. 50)

Attitude: "a person's evaluation of any psychological object (Ajzen & Fishbein, 1980, p. 27)" and "the categorization of a stimulus object along an evaluative dimension (Zanna & Rempel, 1998, p. 319)

Behavioral Intentions: "what the person intends to do" in a specific area of behaviors (O'Keefe, 2002, p. 101)

Brand Familiarity: consumers' accumulated experiences within a brand (Park & Stoel, 2005)

Centrality of Visual Product Aesthetics (CVPA): an individual's significance level of visual aesthetics (Bloch, Brunel, & Arnold, 2003)

Mental Imagery: "a mental event involving visualization of a concept or relationship" (Lutz & Lutz, 1978, p. 611)

Mental representation: "internal forms of information used in memory" (Sadoski & Paivio, 2001, p. 43)

Perceived risk: "The nature and amount of risk perceived by a consumer in contemplating a particular purchase decision" (Cox & Rich, 1964, p. 33)

Preference: "The outcome of a consumer's evaluation process" (Lefkoff-Hagius & Mason, 1993, p. 102)

Product presentation: "a consciously designed presentation of selected merchandise in a defined area (e.g., storefront window or end of aisle), highlighting the product(s) and creating a mood and/or message with the intent to positively affect consumers' approach responses" (Fiore, Yah, & Yoh, 2000, p. 29). In this study, product presentation refers to the manner of merchandise presentation on an apparel website

Style of Processing: individuals' difference of information acquisition and utilization (Childers, et al., 1985)

Visual Fluency: "the ease or difficulty with which image information can be processed (Winkielman et al., 2003, p. 77).

CHAPTER 2

The Effects of Home Page Design on Consumer Responses: A Moderating Role of Brand Familiarity and Centrality of Visual Product Aesthetics

INTRODUCTION

As many offline retailers have extended their market to online sites and thus become multi-channel retailers, increasing research attention has been given to online retailing. Researchers have started applying prior knowledge gained from brick and mortar store retailing to understand consumer behaviors in online retailing. As rapid technology development has improved usability in online retailing, attention to website design has been emerging. Since online retailing provides a different shopping environment from traditional shopping (e.g., consumers interact with products and services through computer screens), different retailing strategies may be required to meet the needs and wants of consumers. For example, similar to store retailers' effort to enhance a store's physical interiors and exteriors to attract shoppers into a store to shop, online retailers focus on website design for online browsers to visit their website and browse products available on a retailer's website.

With growing scholarly interest in online retailing, extant research has examined the effects of various online environmental cues on consumer behaviors, such as product presentation (Kim & Forsythe, 2008; Kim & Lennon, 2008; Park, Lennon, & Stoel, 2005; Yoo & Lennon, 2006; Yoo & Kim, 2009), product descriptions (Kim & Lennon, 2008),

colors (Stevenson, Bruner II, & Kumar, 2000), layout (Griffith, 2005), and website music (Kim, Kim, & Lennon, 2007). Yet, little attention has been paid to home page design in an online shopping context even though a home page is a central part of a website (Vora, 1998).

The role of a website home page in online retailing can be compared to a role of a window display in traditional retailing. Window displays in traditional retailing convey an overall image of a retailer, and attracts consumers' attention (Park, Jaworski, & Macinnis, 1986). Similarly, Sen, Block, & Chandran (2002) noted that a store window's overall aesthetic and ambient elements had a strong impact on consumers' perceptions of the store's image. In addition, window displays in store retailing communicate information about products and promotions (Castaneda, 1996). People make store-entry decisions based on information acquired from window displays (Sen et al., 2002). Consumers observe or infer store-related information from window displays. For example, consumers can see products, price, and promotional activity displayed on windows and infer a store's image from its window displays. In addition to store-related information, consumers obtain information related to product categories. For apparel, consumers can observe the latest fashions trends from window displays. Also, they can imagine product consumption by looking at how clothes are coordinated in window displays (Klokis, 1986; MacInnis & Price, 1987; Sen et al., 2002). Through communicating information about stores and their products, window displays in store retailing can attract consumers to enter the store for further exploration (Sen et al., 2002).

Similar to a window display in store retailing, a website home page in online retailing is posited to play a role in attracting online shoppers to browse the site. Online shoppers may also form a store image based on their impression of a home page. Also, a home page can communicate information about product offerings, pricing, and also promotions like window displays in store retailing. Consumers decide whether or not they enter physical stores based on window displays. However, most online shoppers intentionally log on to a home page of a website first and then decide whether they will browse more or switch to another website based on impressions formed on the home page. Even though the process by which consumers decide to browse more is somewhat different, an online home page plays a similar role to a window in creating online store images and attracting online consumers.

Previous research on home page design has focused on to what extent search engines or directories were convenient for consumers to use (Kim, Lee, & Choi, 2003) because consumers mainly use those functions on a home page. However, with the advance of computer graphics, researchers started to pay more attention to aesthetic design issues of home pages. Ngo and Byrne (2001) speculated that website home pages provide not only cognitive convenience (e.g., search engines), but also emotional experiences, such as positive attitude or positive impression formation. Park, Choi, and Kim (2005) found that visual elements on website home pages made positive impressions about the website. Facilitating positive emotional experiences and creating positive impressions on a website are important because these experiences consequently affect consumers' decision making processes (Janiszewski, 1993; Kim & Moon, 1998).

Visual elements have been found to influence consumers' emotional experiences and impressions. Aladwani and Palvia (2002) included attractiveness, proper use of colors and graphics, graphics-text balance, style consistency, distinctive hot buttons, organizations, and proper use of fonts as specific elements of website appearance. However, according to gestalt theory (Arnheim, 1983), website appearance can be recognized as a whole rather than individual parts by consumers. Therefore, when people shop online, they may be influenced by an entire home page rather than its individual elements, such as layout, music, and background colors. In general, researchers argued that consumers may be affected by the overall aesthetics of a web page as well as specific website design elements when they shop online. Yun and Good (2007) examined effects of online store image on consumer responses based on the gestalt theory and found that overall website features, such as design layout and eye-catching graphical information, enhance the online shopping atmosphere and overall impressions, and influence consumers' loyalty behaviors.

In summary, consumers tend to evaluate a home page from a holistic view, and visual elements may play significant roles in influencing consumers' perceptions and shopping behaviors. Considering the importance of home page design as a central part the appeal of a website, creating a positive impression is important to encourage shoppers to browse a retailer's website. The overall purpose of this study is to explore which home page design (image-oriented vs. text-oriented) seems to lead to positive consumer responses in terms of consumers' information processing, perceptions of aesthetics, and

behavioral intentions and also to understand the various processes by which a home page leads to positive behavioral intentions.

LITERATURE REVIEW

Home Page Design

Home pages have been considered as having a significant effect on company or brand image (Lindgaard, Fernandes, Dudek, & Brown, 2006; Schenkman & Jönsson, 2000). Although home page designs vary depending on retailers, and constantly change to reflect new products, seasonal events or promotions, generally there are three key dimensions determining a consumer's perception of use of a website (Schenkman & Jönsson, 2000): 1) the information available on the site, (2) usability of the site, and (3) impression elicited from the site. The first impression of the website is generally the most important aspect in encouraging users to continue to use the site (Schenkman & Jönsson, 2000). In this light, researchers have investigated characteristics affecting user preference and overall impressions of home pages.

Aesthetics or visual appeal of a website is significant in affecting consumers' decision making processes by providing positive first impressions. Lindgaard et al. (2006) examined consumers' first impressions and visual appeal on a web page and found that visual appeal of a home page is determined within 50 milliseconds and that users' evaluations of visual appeal were consistent over time. In addition, first impressions have been found to affect usability (Schenkman & Jönsson, 2000), trust (Karvonen, 2000), and reliability (Basso et al., 2001). However, even when perceived usability was low in a previous shopping experience, if a web page drew shoppers' attention using visual appeal, the researchers evaluated the usability on that site as very high (Lindgaard & Dudek,

2003). This phenomenon can be explained by a ‘halo effect,’ which means that people make judgments based on their positive first impressions. This halo effect has been considered as a long-term effect of a first impression (Lindgaard et al., 2006). In addition, according to the notion of ‘confirmation bias’ (Nisbett & Ross, 1980), people tent to seek out confirmatory facts supporting their initial assumption and ignore disconfirmatory facts. Therefore, a positive impression obtained on a home page will draw attention away from potential negative issues which may occur in subsequent pages (Campbell & Pisterman, 1996).

In sum, a home page plays an important role in creating a positive image or positive impressions about a website. Online shoppers who are exposed to a home page may decide to enter product pages to search more information, and this decision may be based on the positive impression obtained from the home page. In addition, when a home page elicits a positive impression from consumers, their overall evaluation about their later shopping experience may also be positive based on the halo effect and the effect of confirmation bias.

Visual Fluency

Visual fluency is defined as “the ease with which visual stimuli are processed (Winkielman, Schwarz, Reber, & Fazendeiro, 2003, p.77). When people are exposed to visual stimuli, they need to do cognitive work to process the information. The amount of cognitive work required to process the information varies depending on the

characteristics of visual stimuli. For example, clarity and familiarity of visual stimuli influence ease of information processing, thus increasing the speed and accuracy of the visual information processing (Jacoby, Kelley, & Dywan, 1989).

According to Winkielman et al. (2003), there are two levels of information processes within visual fluency: perceptual and conceptual fluency. Perceptual fluency refers to low-level perceptual processes dealing with features of the target (Jacoby et al., 1989). In general, repetition, contrast, form priming, or duration influences perceptual fluency, thus increasing speed and accuracy of perceptual recognition (Jacoby, 1983). On the other hand, conceptual fluency is related to high-level interpretation processes, such as processing meaning of a target and is influenced by semantic priming, semantic predictability, context congruity, and rhyme (Whittlesea, 1993). However, perceptual fluency and conceptual fluency are interconnected in that both generate similar outcomes on judgments. In addition, each domain of fluency influences the other domain. For example, perceptual manipulation using repetition was found to affect conceptual judgments of truth (Jacoby et al., 1989), whereas conceptual manipulation using semantic priming was found to influence perceptual judgments, such as visual clarity (Masson & Caldwell, 1998).

In an online context, visual stimuli on a home page may affect consumers' visual fluency. In general, a home page of apparel websites contains the latest fashion products often in images and navigational links often in text. However, displaying a fashion trend through visual images may make it more easily understood by consumers than describing it through text. In addition, many navigational tools in text on a home page may be

difficult to for consumers to recognize. Thus, consumers may process information on a home page more easily when they are exposed to visual images than to verbal text. In particular, consumers who shop apparel products may seek out more visual information than those who shop any other product categories, such as books, because visual images are critical in helping consumers evaluate apparel products on a website.

Aesthetics

Aesthetics has been characterized in diverse ways, including beautiful appearance of an object (Lavie & Tractinsky, 2004), visual appeal (Lindgaard & Dudek, 2003), an attitude (Cupchik, 1993), and a judgment or a response (Hassenzahl, 2004). Among them, beauty and visual appeal have been most commonly used in many areas. As people are frequently exposed to aesthetic designs of products, architecture, artifacts, and interiors, they have become knowledgeable about aesthetics. As a result, their needs for aesthetics are greater than before (Maslow, 1970).

The importance of aesthetics has long been acknowledged in "art", but not limited to art only. The concept of aesthetics has been applied to diverse fields of study. For example, applying aesthetics to psychology, Dion, Berscheid, and Walster (1972) studied person perception toward attractive people and investigated the "what is beautiful is good" stereotype. The researchers found that attractive people are perceived to have desirable personalities and to have happy and successful lives. With regard to personalities, attractive people are assumed to be kind, interesting, sensitive, warm,

confident, assertive, sexually responsive, and serious (Hatfield & Sprecher, 1986). Based on perceptions of attractive people, Baker and Churchill (1977) suggested that attractive models in advertisements could enhance the perceived credibility of the communicator and acceptance of the communicated message. So, the use of attractive models may increase the effectiveness of the advertisements.

Recent research has investigated the implications of aesthetics for development of visual displays. For example, aesthetics influenced people's perceptions of architecture (Nasar, 1988), artifacts (Postrel, 2002), product design (Tractinsky, 2004) and store environment (Kotler & Rath, 1984). Human-computer interaction researchers argue that aesthetics has been neglected in the area of computer engineering because the computer has been considered as in terms of science, efficiency, and utility, rather than from the point of view of aesthetics. However, research in the computer industry has found robust results showing that aesthetics plays an important role in affecting consumer responses (Lindgaard et al., 2006; Schenkman & Jönsson, 2000; Tractinsky, 2004). Postrel (2001) argued that Apple's iMac is an example of an "aesthetic revolution in computing" and its' design has been a key factor affecting consumers' purchase decisions. In addition to the design of computer itself, the aesthetics of web page design has been highlighted. Tractinsky (2004) developed a framework for the study of aesthetics in information technology. According to the framework, design characteristics of interactive systems affect consumer responses to the design, such as attitudes, performance, satisfaction, and usage pattern, and consumers' perception, cognition, and affect and their evaluations of aesthetics mediate the relationship between design characteristics and responses.

Empirical research has found that website design is a main determinant of perceived credibility, perceived quality (McKnight, Choudhury, & Kacmar, 2002), usability (Tractinsky, 1997), satisfaction (Lindgaard & Dudek, 2003), and behavioral intentions (Yoo & Kim, 2008). Perceived beauty was highly associated with consumers' perceived goodness of a system (Hassenzahl, 2004). Thus, website aesthetics affects consumers' preferences for websites (Schkenkman & Jönsson, 2000) and their perceived ease of use (Tractinsky, Shoval-Katz, & Ikar, 2000).

When it comes to online apparel retailing, visual aesthetics of a home page is posited to play an important role in influencing consumer responses. Visual elements on apparel website home pages provide emotional experiences (Ngo & Byrne, 2001) and increase consumers' perceived aesthetics (Tractinsky, 2004), which consequently influence consumers' preference of the website. If consumers prefer one website to others, they are more likely to browse or revisit that website in the future.

Home Page Design and Consumer Responses

Information on a home page can be presented with both text and images. Compared to other sources of information, online websites make it easier to integrate images and text in a single page and provide flexibility and a wide-ranging capability to create and communicate information (Wiebe & Howe, 1998). While a home page usually contains both images and text, either the images or text can dominate, thus making it either more image-oriented or text-oriented. For example, some websites focus on visual

images on their home pages with a minimal amount of text (e.g., J.Crew.com) whereas some websites mainly use verbal text with few images (e.g., Zappos.com). Since people are influenced by environmental stimuli (Donovan & Rossiter, 1982), when people are exposed to either image-oriented or text-oriented websites, their responses, in terms of visual fluency and perceived aesthetics may differ.

Visual Fluency of a Home Page

When people process information from text, they make a series of rapid eye movements (Marks & Dulaney, 1998). Between these eye movements, the eyes stay fixed on a part of the text for a fairly long time, and the viewer obtains useful information from the fixed moments. In other words, the information that viewers obtain from a text is an accumulation of discrete pieces of information gathered while their eyes pause on text between movements (Marks & Dulaney, 1998). However, among the abundant information, people only process a certain amount of information based on their selective attention, which refers to the fact that people select and process only information relevant to them. In this regard, researchers have argued that including unique or distinctive features using colors or visual displays is a useful way of helping people process large amount of information more efficiently.

It can be hard for website users to obtain useful information from text-oriented sites. People tend to be overwhelmed when they are exposed to hyper-text conditions because of the vast amount of information available (Vora, 1998). Therefore, Vora suggested that including distinctive features using colors or visual displays can aid people

in processing the information. Vora also provided website design guidelines based on people's behaviors and preferences of websites. People's common behaviors and reaction on a website included the following; (1) "users do not read the entire page, they scan the links first," (2) "users do not like to read text online," (3) "users appreciate pages that are pleasing," and (4) "users care about ease of use."

Image-oriented information is expected to be easier to process than text-oriented information. Many researchers have emphasized the importance of images because images increase the visual appeal of the website (Levine, 1995; Lynch, 1996, Wiebe & Howe, 1998). According to Hodes (1994), when visual images are properly designed and used, visual images can be dominant tools for information encoding because images can increase the amount of information to be processed. As powerful tools for expressing concepts, images can help people synthesize a large amount of disparate information on a web page and review and organize information with minimal resources (Wiebe & Howe, 1998). Such visual fluency can be increased by presentation variables, such as visual clarity (Reber, Schwarz, & Winkielman, 2004). Empirical study has also found that people use less cognitive effort to process visual images than the comparable verbal information (Hirschman, 1986). Hirschman suggested that visual images are more appropriate in advertising, especially when people feel uncertain and unfamiliar with products, because visual images seem to require fewer cognitive resources during processing than does textual information, thereby increasing the consumer's willingness to consider the product for a purchase.

In this study, an image- oriented home page refers to a home page presenting mainly visual images with a minimal amount of text, such as navigational links and brand names, whereas a text-oriented home page refers to a home page presenting mainly verbal information about products and navigational links with a few images, such as brand logos. Based on findings in prior literature, when consumers are exposed to an image-oriented home page on apparel websites, their speed and accuracy of visual information processing (visual fluency) may be greater compared to consumers exposed to a text-oriented home page. Thus, they may process information on a home page more easily when they are exposed to visual images than to verbal text. Therefore, the following hypothesis was developed.

H1: As compared to those exposed to a text-oriented home page, people who are exposed to an image-oriented home page will perceive that the home page is more visually fluent.

Perceived Aesthetics of a Home Page

Because of development of technology in graphic design, more and more people expect graphic quality on websites (Postrel, 2001), and text in these domains has been considered as a minor factor influencing aesthetics (Tractinsky, 2004). According to Hoffmann and Krauss (2004), visual aesthetics manipulated by colors, text, image, and animation in websites can influence consumers unconsciously. A study of web pages done by Schenkman and Jönsson (2000) revealed that preference was determined by pictures versus text, overview (how clear and easy to understand the web page was), and

beauty of a web page. In addition, overall impression was mostly determined by beauty, and appeal of web pages was influenced by a combination of pictures and beauty. In order to provide a positive first impression of a website, the researchers recommended using pictures rather than text because visual elements determine the aesthetic perception of a web page.

Further, Park et al. (2005) noted that home pages are often evaluated by visual representation factors because they have a direct or indirect impact on impression formation. In addition, Yoo and Kim (2008) found that an image-oriented home page plays a significant role in influencing consumers' positive emotions, positive brand images, and behavioral intentions. The effects of aesthetic design of a web page on user preference (Norman, 2004) and overall user satisfaction (Lindegaard & Dudek, 2003) were also significant.

Hartmann, Sutcliffe and De Angeli (2007) examined individuals' perceptions of website aesthetics and their decision making based on a theory of attractiveness. The researchers manipulated three levels of website aesthetics: (1) image-intensive design, colorful, and hover-links, (2) traditional tabular style, and (3) plain, simple, and text-based. The results revealed that people perceived a website including imagery, colors, and hover-links to be the most attractive, followed by websites showing traditional style and finally by websites focusing on plain, simple and text-oriented presentation. The researchers also asked for further comments from participants about each website. Participants expressed the most positive opinions on the first website (e.g., favorable, well designed aesthetically, and good use of imagery) and the most negative opinions on

the last website (e.g., lack of images and color-scheme). In addition to individuals' evaluation of aesthetics, participants' preference for and rating of usability of the websites varied significantly. The first website was rated most favorably whereas the last website was rated most negatively. Therefore, based on the previous research, the following hypothesis was developed.

> **H2**: As compared to those exposed to a text-oriented home page, people who are exposed to an image-oriented home page will perceive a higher level of aesthetics.

Individual Differences

The proposed study speculates that individual differences moderate how people respond to a different home page design. The two main individual characteristics that will be investigated are brand familiarity and centrality of visual product aesthetics.

Brand Familiarity

Brand familiarity is defined as consumers' accumulated experiences within a brand (Park & Stoel, 2005). Brand familiarity can be enhanced by frequent exposure to the brand and thus can be a significant internal source of information. For example, consumers can experience a brand directly by using or purchasing a product, or they can experience a brand indirectly through advertisements (Alba & Hutchinson, 1987). Kent and Allen (1994) found empirical evidence of indirect experiences of a brand. Consumers tended to consider a brand as familiar when the brand was frequently advertised in

national media. In addition, a well-known brand is more familiar to consumers and easier to be recalled and recognized than an unknown brand.

Much previous research has found effects of mere exposure on consumer behaviors. According to the "mere exposure effect", as a person is exposed to a stimulus repeatedly, it creates certain positive effects on the stimulus (Zajonc & Markus, 1982). For example, positive attitude toward an object is a function of exposure and the effect increases depending on the number of exposure. Winkielman et al. (2003) also argued that familiarity increases visual fluency of an object because people process previously exposed stimuli more easily than novel stimuli. In other words, repeated exposure stimulates information processing, which in turn affects faster stimuli recognition and clearer judgments than novel stimuli. Also, repeated exposure reduces relevant brand activities (Jacoby & Dallas, 1981). Therefore, when consumers are familiar with a brand, they can easily identify the brand logo or design styles better than those who are unfamiliar with the brand. In an online shopping website, repeated experiences with a brand may increase the ease with which the physical features of the home page can be identified (perceptual fluency) and the ease with which associations to the home page come to mind (conceptual fluency).

The positive influence of familiarity is not limited to fluency. Familiarity increases perceived aesthetics, liking, and judgments. In order to explain a relationship between familiarity and perceived aesthetics, Zizak and Reber (2004) explained historical patterns in which people liked familiar art forms and tended to avoid new forms. For example, when Realism was appreciated by most of people, they expressed strong

antagonistic feeling toward Impressionist paintings. However, as people became familiar with the new form of art, they started to praise and highly value Impressionism. This phenomenon is very common in other areas, such as music, clothing, design and even science. Similarly, when consumers are exposed to an online home page of a familiar brand, their evaluation of aesthetics may be more positive than those exposed to an online home page of an unfamiliar brand.

Advertising research has found that repetition of an advertisement affects consumers' liking or disliking of the advertisements, and consequently influences their brand evaluations and other responses (Cox & Cox, 1988; MacKenzie, Lutz, & Belch, 1986). In addition, prior exposure increases preference of related products. Lee and Labroo (2004) found that consumers who were exposed to an advertisement for mayonnaise increased their preference for ketchup, but not for an unrelated product, such as an alkaline battery.

Familiarity also affects people's judgments of truth. For example, when people encounter certain information repeatedly, they tend to believe that the information is true due to the ease of perceptual fluency (Reber et al., 2004), and the same effect was found in advertising materials (Hawkins & Hoch, 1992). In an online shopping context, when people are exposed to a certain brand repeatedly, the familiarity may increase their behavioral intentions because their ease of processing information on a home page may influence their judgments and evaluations positively. Laroche, Kim, and Zhou (1996) noted that brand familiarity is "an antecedent of confidence in brand evaluations (p 115),"

and confidence refers to consumers' subjective belief toward a brand and their evaluation (Howard, 1989). Therefore, brand familiarity increases consumers' behavioral intentions.

H3: Brand familiarity will moderate the relationship between website design and consumer responses (a: visual fluency, b: perceived aesthetics).

Centrality of Visual Product Aesthetics

According to Hartmann et al. (2007), users' evaluation of website aesthetics differed depending on participants' backgrounds. The researchers examined effects of participants' academic majors as an individual background and found that design students tended to rate website aesthetics as more important than students taking technical courses. The result indicates that visual aesthetics varied based on an individual's degree of significance regarding design, and this individual characteristic can be explained by the centrality of visual product aesthetics (CVPA) (Bloch, Brunel, & Arnold, 2003). The centrality of visual product aesthetics refers to an individual's significance level of visual aesthetics, and is considered as a general consumer characteristic. However, CVPA does not determine an individual's preference toward a particular aesthetic style. According to Bloch et al., consumers with high CVPA are more likely to be concerned with visual aesthetics, thus influencing preference of brand and products and purchase decisions of the visually aesthetic product. CVPA is divided into three dimensions: (1) an individual's perceived value of aesthetic product design, (2) an individual's ability in evaluating product design, and (3) an individual's different responses to the product aesthetics.

Additional experiments (Bloch et al., 2003) found that CVPA plays a significant role in influencing attitudes toward the product and behavioral intention. Even though the researchers' study was exploratory, it suggested that a different level of CVPA may influence the preference of website layout or store interiors. High CVPA consumers may make product and brand inferences based on the visual product aesthetics. In addition, they tend to acquire information and make judgments faster than low CVPA consumers, which means CVPA influences visual fluency. The study of CVPA is still exploratory and more empirical evidence is required. However, as the researchers have recommended, other consumer responses, such as visual fluency and perceived aesthetics may be different based on an individual's level of CVPA. This discussion led to the development of the following hypotheses.

H4: CVPA will moderate the relationship between website design and consumer responses (a: visual fluency, b: perceived aesthetics).

Relationship between Visual Fluency and Aesthetics

People's evaluations of beauty are all different and hard to define. However, in general, simplicity, symmetry, balance, clarity brightness, and contrast have been considered key characteristics influencing people's perception of aesthetics (Arnheim, 1974; Birkhoff, 1933; Gombrich, 1984). On the other hand, Winkielman et al. (2003) noted that beauty is not in the eye of the beholder because all of these characteristics are based on one important feature, visual fluency. People tend to consider the stimuli as

beautiful when they process the stimuli easily, and the concept of beauty depends on the ease of processing the stimuli. Thus, visual fluency affects aesthetic perceptions (Reber & Schwarz, 2000). Compared to less visually fluent stimuli, people evaluate the more visually fluent stimuli as more attractive and pleasing (Reber et al., 2004). Labroo, Dhar, and Schwarz (2008) also documented that ease of visual processing a product label increases its aesthetic appeal. Therefore, the following hypothesis was developed.

H5: There will be a positive relationship between visual fluency of a home page and perceived aesthetics of the home page.

Preference

Preference has been found to influence consumers' decision making, marketing, experimental aesthetics, attitude, or impression formation research (Zajonc & Markus, 1982). Preference is defined as "the outcome of a consumer's evaluation process," and has been used to examine how consumers choose products (Lefkoff-Hagius & Mason, 1993, p. 102). In this study, preference refers to individuals' liking for websites.

Prior research has found that visual fluency plays a role in influencing consumers' liking of the stimulus. According to Winkielman et al. (2003), people tend to show preference for pleasing stimuli and also familiar stimuli because these stimuli are more visual fluent. Visual fluency has been experimentally manipulated in various ways. For example, Winkielman et al. manipulated drawings of everyday objects (e.g., cars, and animals) and abstract objects (e.g., dots, and circles). The researchers also manipulated

symmetry of picture and presentation duration to examine the effects of fluency. However, regardless of how visual objects are manipulated, the results were consistent in that people liked visual stimuli which were processed easily. Reber, Winkielman, and Schwarz (1998) also argued that any stimuli influencing visual fluency increase preference for the stimuli even with a single exposure to the stimuli. This finding led to the following hypothesis:

H6: There will be a positive relationship between visual fluency of a home page and preference for the website.

Aesthetics or visual appeal also influences consumers' preference. Schenkman and Jönsson (2000) argued that first impression from a website plays a role in making consumers stay on the website and examined how a website's visual impression affects consumers. The result showed that people considered image-oriented website more beautiful than text-oriented website. In addition, people preferred the image-oriented website to the text-oriented website. Therefore, the following hypothesis was developed.

H7: There will be a positive relationship between perceived aesthetics of a home page and preference for the website.

Behavioral Intentions

Behavioral intentions refer to "what the person intends to do" in a specific area of behaviors (O'Keefe, 2002, p. 101). The purpose of this study is to examine effects of

home page design on consumers' behavioral intention. On a home page, consumers decide whether or not they enter product pages to investigate more products. In addition, if consumers create positive impressions of a home page, they may want to revisit the website even if they leave the website in a short period of time. Therefore, intention to revisit and intention to browse more will be measured as consumers' behavioral intentions in this study.

Compared to the effects of visual fluency on memory, recall, affective responses, and evaluative judgments, little research has been done to find the effects of visual fluency on behavioral intentions. According to Im and Stoel (2007), consumers' perceptual fluency influenced by visual information on an apparel website affects their behavioral intentions. Since apparel shoppers tend to focus more on visual information of product, poorly presented visual information confuses consumers and complicates their decision making, which finally reduces consumers' behavioral intentions. Online experiments using mock apparel websites found that fluency of visual information processing influenced consumers' satisfaction, behavioral intentions. In addition, the study found that fluency not only influenced behavioral intentions directly, but also influenced them indirectly through consumers' evaluation of visual aesthetics. Therefore, the following hypothesis was developed.

H8: There will be a positive relationship between visual fluency of a home page and consumers' behavioral intentions.

Advertising research has found that aesthetics has a significant impact on consumers' purchasing behaviors (Jennings, 2000). Jennings argued that pleasing and attractive visual stimuli are important in creating first impressions on websites because visual aesthetics affects consumers' intentions to explore more. In an online context, Hall and Hanna (2004) empirically studied the effects of background colors of websites on consumers' aesthetic perceptions and behavioral intentions. The research findings showed that there is a significant relationship between consumers' aesthetic perceptions and their behavioral intentions. Consistent with Hall and Hanna, Im and Stoel (2007) found that consumers' evaluation of visual aesthetics of a website influenced behavioral intentions. Therefore, the following hypothesis was developed.

H9: There will be a positive relationship between perceived aesthetics of a home page and consumers' behavioral intentions.

Much prior research has demonstrated that an individual's behavioral intention is determined by the individual's affective attitudes, such as preference (Morris, Woo, Geason, & Kim, 2002; O'Keefe, 2002). Suh and Yi (2006) examined the effects of brand attitudes on the customer satisfaction-loyalty relation in an advertising context. In the study, brand attitudes were measured by degree of liking and favorability, and loyalty was measured by intention to repurchase and intention to recommend. The results showed that consumers' preference (liking) significantly affected their behavioral intentions. In other words, consumers' intentions to repurchase and recommend were largely influenced by their degree of preference. The results were consistent with a

previous study showing a positive relationship between preference and consumers' behavioral intention (Bower, Saadat, & Whitten, 2003). This finding led to the following hypothesis:

H10: There will be a positive relationship between consumers' preference for a website and their behavioral intentions.

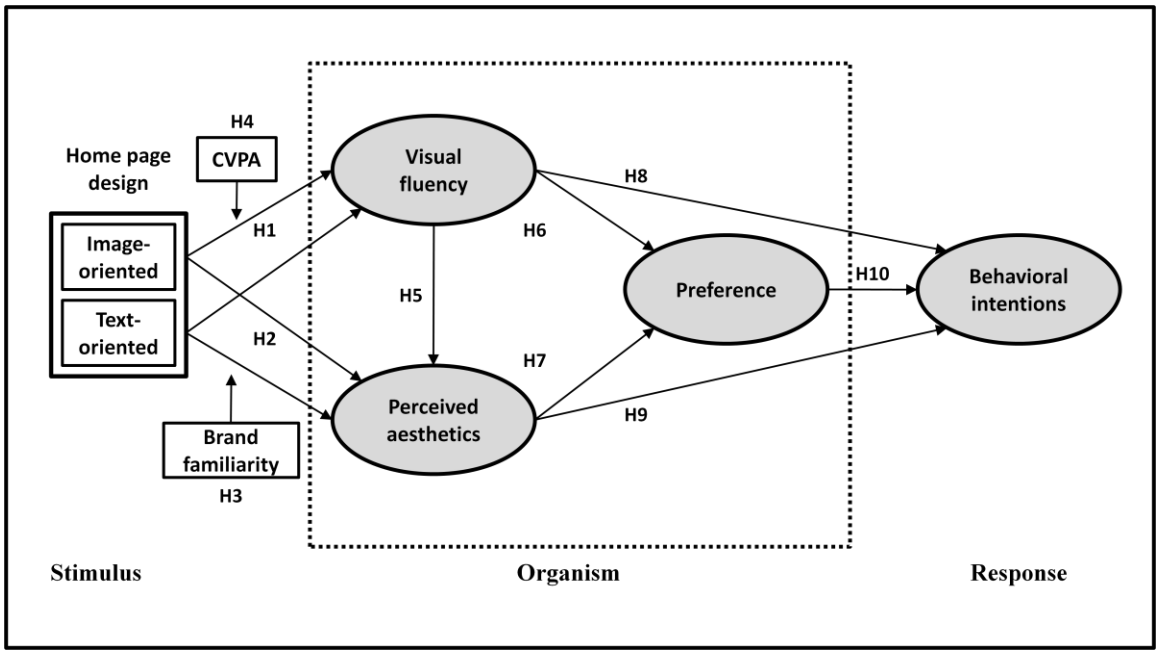

Figure 2.1. Hypotheses development

METHOD

This study used an online experiment. The design of this study was one factor between-subjects design with two moderators: brand familiarity and centrality of visual product aesthetics (CVPA). Two levels of the independent variable were an image-oriented versus a text-oriented home page. Two levels of brand familiarity were familiar versus unfamiliar, and two levels of CVPA were high versus low.

Pretest

A pretest was conducted to select reliable stimuli for the main experiment. In order to select familiar and unfamiliar brands, 3 well-known brand names (e.g., Polo Ralph Lauren, J. Crew, and Anthropologie) and 3 less-known brand names (e.g., Club Monaco, French Connection, and Agnés b) were selected. Three items to be evaluated with a 7-point scale are "(1) I am very familiar with the brand, (2) I have a lot of previous experiences with the brand, and (3) I have a great deal of information about the brand" (strongly agree = 7 to strongly disagree = 1) (See Appendix C). The second and the third items were originally used by Laroche et al. (1996). The researchers measured brand familiarity for six brands, and reliability for each brand ranged from .67 to .83. However, even if participants did not have any previous experiences with the brand, they may be familiar with the brand due to exposure to advertisements. Therefore, another question tapping brand familiarity in general was included (i.e., I am very familiar with the brand).

Eighty-three female students in the Department of Design and Human Environment at Oregon State University participated in the pretest, and extra credit was given to the participants. One web page including 6 brand names was created. Invitation emails including the URL for the web page were sent to the students. Once they clicked the URL, they could view the survey questions.

In order to analyze data from the pretest, reliability of the familiarity scale was assessed. The resulting Cronbach's *alphas* for the six brands ranged from .86 to .97. Data from the pretest were also analyzed using descriptive statistics. Based on the mean scores, Polo Ralph Lauren was selected as a familiar brand (M = 4.72, SD = 1.78) whereas Agnés b was selected as an unfamiliar (M = 1.32, SD = .97) (See Appendix F, Table F.1).

Main Experiment

Stimulus and Instrument Development

Based on the results of the pretest, four types of home pages were manipulated for the main experiment: (1) an image-oriented home page + a familiar brand (Polo Ralph Lauren), (2) an image-oriented home page + an unfamiliar brand (Agnés b), (3) a text-oriented home page + a familiar brand (Polo Ralph Lauren), and (4) text-oriented home page + an unfamiliar brand (Agnés b) (See Appendix D). The image-oriented home page presented a big image including clothes worn by models in the center and minimal navigational links in text. On the other hand, the text-oriented home page presented navigational links in text with minimal images. Another individual difference, two levels

of centrality of visual product aesthetics (CVPA) was measured, and a median-split was used to distinguish individuals with high CVPA and low CVPA.

Within each of the four conditions, participants were exposed to two web pages. On the first page, an informed consent form, the overall purpose of this study, the ethical commitment not to release individual responses, and other information were provided. Also, the researchers' status and affiliation were provided. On the second page, participants viewed an online home page, and survey questions measuring visual fluency, perceived aesthetics, preference, and behavioral intentions.

Procedure and Participants

This research was reviewed and was classified as exempt by the Oregon State University Institutional Review Board (IRB) and was assigned protocol number 4249 (See Appendix N).

The data were collected from a random sample of female college students in Oregon State University. The Office of the University Registrar randomly extracted 4,000 students email addresses from all female students enrolled at Oregon State University. College students are major Internet shoppers (Lee & Johnson, 2002) and comprise 63% of shoppers at online apparel and beauty websites (Internet Retailer, 2004). Thus, college women were deemed appropriate subjects for the study. The participants were randomly assigned to one of four treatment conditions. Thus, 1,000 potential participants were assigned to each experimental condition.

Invitation emails were sent to 4,000 college female students. The participants were randomly assigned to one of four treatment conditions. When they clicked the URL link provided in the invitation email, they could view an informed consent document, a home page of an apparel website and survey questions. One reminder was emailed seven days after the invitation.

Instrument Development

Visual Fluency

Visual fluency was measured using two items developed by Labroo et al. (2008) ($\alpha = .70$). The participants were instructed to check their visual fluency using 7-point rating scales from (7 = very eye-catching, and easy to process) to (1 = Not at all eye-catching, and difficult to process). The original scale included another item (very attractive (7) - not at all attractive (1)) tapping attractiveness. However, since this study measured visual aesthetics, the third item tapping attractiveness was excluded. All measurement scales are presented in Appendix E.

Perceived Aesthetics

Perceived visual aesthetics was measured using 3 items with 7-point Likert type scale: strongly agree (7) – strongly disagree (1). The items included "the way this website displays its products is attractive," "this website is aesthetically appealing," and "I like the way this website looks." This scale was successfully employed to measure visual appeal of a website, and reliability was .92 (Mathwick, Malhotra, & Rigdon, 2001).

Preference

The participants were instructed to check their preference for the website using 7-point rating scales from (7 = strongly agree) to (1 = strongly disagree). The items included "good website", and "like the website." These items were employed to measure preference of a brand study (Costley & Brucks, 1992; Cronbach's $\alpha > .90$), but modified to be used in a context of website. The item, "would buy the brand" was eliminated from the original scale because there was another scale measuring behavioral intentions in this study.

Behavioral Intentions.

Behavioral intentions were measured using a two-item scale with 7 point Likert rating scale (1 = unlikely, improbably, not possible and 7 = likely, probably, possible). Items included "how likely is it that you would revisit the website that you saw today?" and "how likely is it that you would browse more products on the website that you saw today?"

Centrality of Visual Product Aesthetics

Eleven-items designed to measure centrality of visual product aesthetics (CVPA) were developed by Bloch et al. (2003). For example, subjects were asked to indicate "Owning products that have superior designs makes me feel good about myself"; "I see things in a product's design that other people tend to pass over"; and "when I see a product that has a really great design, I feel a strong urge to buy it." Each item has a

range of 7, anchored by “strongly agree (7)” to “strongly disagree (1).” Reliability was .89.

Demographic information

Demographic information including age, ethnicity, and major were collected from the participants at the end of the questionnaire, and participants’ online shopping and browsing experience were assessed. Items assessing participants’ online experience included “how often do you use the Internet?” (1= never, 7 = everyday); “How often do you browse for products online except for apparel?” (1= never, 7 = more than 20 times a month); “How often do you purchase products online except for apparel?” (1= never, 7 = more than 10 times a month); “How often do you browse for apparel online website?” (1= never, 7 = more than 20 times a month); and “How often do you purchase apparel online?” (1= never, 7 = more than 10 times a month). Scores from each measure were summed and averaged to be used as the overall score for each dependent variable.

ANALYSES AND RESULTS

Description of Participants

Demographic Characteristics of Participants

Of the randomly selected students who were sent invitation emails, a sample of 669 female students participated in this study, for a response rate of 16.7% (669/4000). Among 669 responses, 11 respondents were eliminated from the analysis since 4 respondents overlapped with participants of pretests and 7 respondents gave anomalous responses to most of the test items. Therefore, answers from 658 participants were determined to be usable and included in the analyses.

The mean age of participants was 24.34 (*SD* = 8.49), with a range of 17 to 64. The majority of the participants' ages were between 18 and 21 (56.6%). Ethnically, Caucasian was predominant (76.7%), followed by Asian/Asian Americans (14.9%), Hispanic Americans (4.3%), and African Americans (.6%).

The majors of the participants varied and were classified into ten colleges, such as Health and Human Sciences (22.2%), Liberal Arts (19.1%), Science (16.7%), Engineering (8.1%), Business (7.1%), Education (7.1%), Agricultural sciences (5.9%), and Pharmacy (2.7%). Regarding the academic standing of the participants, there were fairly equal contributions for freshman, sophomores, and graduate students. Junior and seniors accounted for 14.6% and 11.2% respectively. Descriptive statistics for the demographic characteristics of the participants can be found in Table 2.1.

Table 2.1. Demographic profile of participants

Variable	Category	Mean	Frequency	Percent
Age	Under 20	24.34	230	35
	20-25	(*SD* = 8.49)	249	37.8
	26-30		67	10.2
	31-40		71	10.8
	Over 41		39	5.9
	Unknown		2	.3
Ethnic background	African American		4	.6
	Asian/Asian American		98	14.9
	Caucasian		505	76.7
	Hispanic American		28	4.3
	Native American		8	1.2
	Other		15	2.3
Academic major	Agricultural Sciences		39	5.9
	Business		47	7.1
	Liberal Arts		126	19.1
	Education		47	7.1
	Engineering		53	8.1
	Forestry		25	3.8
	Health & Human Sci.		146	22.2
	Pharmacy		18	2.7
	Science		110	16.7
	Other		47	7.1
Academic standing	Freshman		160	24.3
	Sophomore		151	22.9
	Junior		96	14.6
	Senior		74	11.2
	Graduate		160	24.3
	Other		17	2.6
Total			658	100

Participants' Internet Shopping Experience

Overall, participants used the Internet everyday (91.2%). About 42.9% of the participants reported that they browsed online for products (except for apparel) more than 13 times a month, and about 14.5% purchased the products online more than 7 times a month. For monthly apparel shopping behaviors, about 36.5% of the participants browsed

apparel online more than 13 times. However, only 10.9% of the participants purchased apparel online more than 7 times a month (See Table2.2). Compared to the frequency of online browsing behaviors, the number of products purchased online was very low. Also, 20.5% of the participants never purchased apparel online, which was much higher than the number who never purchased other products online (7.4%).

Table 2.2. Participants Internet shopping experience (N = 658)

# of times per month		Never	1-6	7-12	13-18	19-24	25-30	30-	missing
Internet use	*f*	0	1	2	10	8	19	600	8
	%	0	.2	.3	1.5	1.2	4.4	91.2	1.2
		Never	1-4	5-8	9-12	13-16	17-20	20-	missing
Online shopping	*f*	12	99	106	158	127	77	78	1
	%	1.8	15.0	16.1	24.0	19.3	11.7	11.9	.2
Online shopping for apparel	*f*	42	122	119	135	103	72	65	0
	%	6.4	18.5	18.1	20.5	15.7	10.9	9.9	0
		Never	1-2	3-4	5-6	7-8	9-10	10-	missing
Online purchase	*f*	49	246	145	121	61	19	15	2
	%	7.4	37.4	22.0	18.4	9.3	2.9	2.3	.3
Online apparel purchase	*f*	135	234	115	100	49	13	10	2
	%	20.5	35.6	17.5	15.2	7.4	2.0	1.5	.3

Manipulation Checks

Manipulation checks were performed to determine whether or not the manipulations of home page designs and brand familiarity were effective. In order to check whether the home page design was image-oriented or text-oriented, one question was asked to the participants, “This home page design is text-oriented (1) – image oriented (7)”. Results of t-test revealed a significant difference in home page design

between image-oriented home page and text-oriented home page (t = 56.73, df = 654, p < .001). The mean score for the image-oriented home page was 5.91 (SD = 1.10). However, the mean score for the text-oriented home page was 1.45 (SD = .92).

Manipulation of brand familiarity was examined using the same scale used in the pretest. Three items evaluated with a 7-point scale were (1) "I am very familiar with the brand", (2) "I have a lot of previous experiences with the brand", and (3) "I have a great deal of information about the brand" (strongly agree = 7 to strongly disagree = 1). Reliability of the scale was acceptably high (Cronbach's *alpha* = .92). Therefore, the three items were summed and averaged to be used as the overall score of brand familiarity. The results of t-test showed that there was a significant difference in brand familiarity between the two brands, Polo Ralph Lauren and Agnés b (t = 27.01, df = 556, p < .001). Participants perceived Polo Ralph Lauren as a familiar brand (M = 4.14, SD = 1.57) whereas they perceived Agnés b as an unfamiliar brand (M = 1.40, SD = .97). Therefore, manipulations of home page designs and brand familiarity were successful.

Preliminary Analyses

This study included four dependent variables: visual fluency, perceived aesthetics, preference, and behavioral intentions. Results of descriptive statistics and exploratory factor analyses for the variables are presented in this section.

Exploratory Factor Analysis

The CVPA scale was measured using 11 items developed by Bloch et al., (2003). In the previous study, Bloch et al. identified three factors including value, acumen, and response of the CVPA. In order to determine dimensions of the CVPA used in this study, a factor analysis was conducted by employing maximum likelihood estimation and varimax rotation. A minimum eigenvalue of 1.0 was used as a criterion to control the number of factors extracted. Also, items were eliminated if they loaded at less than .40 on a single factor or cross-loaded at more than .40 on other factors. The results were consistent with previous research (Bloch et al., 2003) and three factors with 10 items were identified (See Appendix F, Table F.2).

Reliabilities and Descriptive Statistics

Cronbach's *alphas* were calculated to check reliability of each measure. All Cronbach's *alphas* ranged from .85 to .98, indicating internal consistency of the scales (See Table 2.3). The mean scores of visual fluency, perceived aesthetics, preference, intention to browse a website, and intention to revisit a website were 3.98, 3.47, 3.54, 3.71, and 3.28, respectively within a possible range of 1 to 7. The items within each scale were summed and averaged to be used as the overall score for each variable.

The CVPA was used as a moderator in this study. In order to test hypotheses, a median-split was used to divide the sample into high and low CPVA groups. People above the median (*Med* = 4.40) were categorized into a high CPVA group whereas people below the median value were categorized into a low CVPA group. People in a

high CVPA group concern more about visual aesthetics than people in a low CVPA group. As a result, 327 (49.7%) participants were included in a high CPVA group and 331 (50.3%) participants were included in the low CPVA group. There was a significant difference in CVPA mean score between the high CVPA group (M = 5.42, SD = .66) and the low CVPA group (M = 3.32, SD = .89) (t = 34.33, df = 556, p < .001).

Table 2.3. Descriptive statistics for dependent variables (N = 658)

Variable	Cronbach's *alpha*	Min.	Max.	Mean	*SD*
Visual fluency	.85	1	7	3.98	1.86
Perceived aesthetics	.98	1	7	3.47	2.00
Preference	.98	1	7	3.49	1.90
Intention to browse a website	.98	1	7	3.71	1.89
Intention to revisit a website	.97	1	7	3.28	1.95
CVPA (value)	.88	1	7	4.44	1.47
CVPA (acumen)	.91	1	7	4.19	1.55
CVPA (response)	.86	1	7	4.52	1.51

Measurement Model Specification

A structural equation model can be divided into a measurement model and a structural model. The measurement model identifies relations between the observed variables (indicators) and the latent variables whereas the structural model denotes causal relationships among the latent variables (Bollen, 1989). Based on a two-step modeling approach (Anderson & Gerbing, 1988), a confirmatory factor analysis (CFA) was conducted to estimate unidimensionality (internal and external consistencies) and construct validity (convergent and discriminant validities) of the items for each latent construct. If necessary, a measurement model should be adjusted based on theoretical and

statistical considerations. Anderson and Gerbing provided four methods of respecification of the measurement model: (1) relating a problematic indicator to a different factor, (2) deleting the indicator from the model, (3) associating the indicator (observed variable) with multiple factors, or (4) correlating measurement errors. In general, if a factor loading from an indicator to a latent variable is lower than .6 and if squared multiple correlation (SMC) is lower than .4, measurement model need to be reconsidered (Bagozzi & Yi, 1988).

Maximum likelihood estimation was used to estimate parameters for the CFA. There were two indicators remained for each of four latent constructs in the respecified model (See Figure2.2). A3 was deleted from the measurement model based on modification indices (MI) assessing possible misspecifications of the model.

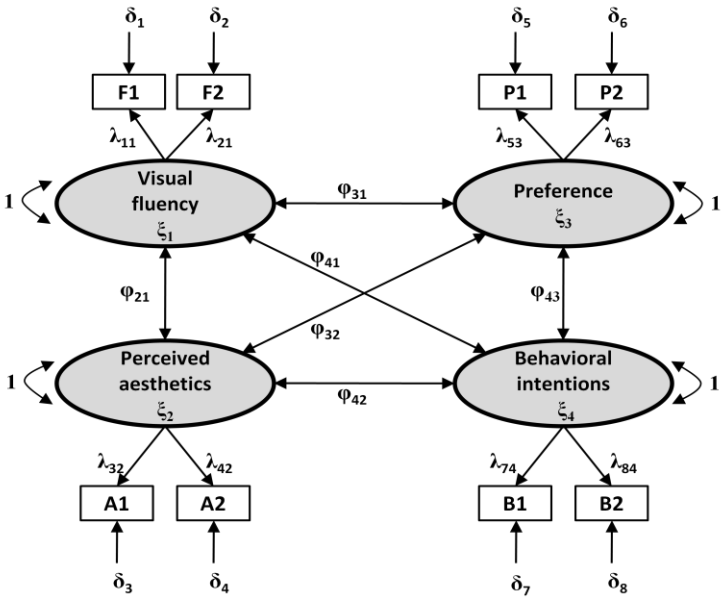

Figure 2.2. A CFA model for final measurement items

After completion of measurement model estimations and respecifications, the overall fit of the respecified model was assessed. Chi-square statistic is a basic fit index to test an overall fit of a model (Jöreskog & Sörbom, 1993). Significant chi-square statistic indicates a poor fit whereas non-significant value designates a good fit. In this model, the result of the CFA showed a significant chi-square statistic (χ^2 = 50.50, *df* = 14, *p* = .000). However, since chi-square statistic tends to be significant with a large sample size by increasing χ^2 value (Kaplan, 1990), other fit indices, such as RMSEA, CFI, NFI, and IFI were taken into consideration.

According to Brown and Cudeck (1992), RMSEA less than .05 designates a close fit of the model, RMSEA ranging from .05 to .08 indicates a fair fit, and RMSEA greater than .10 indicates a poor fit. Also, other fit indices, such as CFI, NFI, and IFI greater than .95 specify a satisfactory fit of the model to the data (Hair, Black, Babin, Anderson, & Tatham, 2006). Although the results of CFA showed the significant chi-square statistic due to the large sample size (*N* = 658), other fit indices fell into acceptable ranges (RMSEA = .063 [90% C.I. = (.045; .082)], NFI = .99, CFI = .99, IFI = .99, and TLI = .99).

In order to assess construct validity, convergent validity and discriminant validity were examined. Convergent validity can be achieved if all factor loading values are high and statistically significant (Anderson & Gerbing, 1988). More specifically, Bae (2007) suggested that factor loadings should be at least .5 and ideally greater than .7. The results from CFA of the respecified measurement model revealed that all path coefficients in the

CFA model were greater than .7 and statistically significant at the *p* value of .001 level, providing the evidence of convergent validity (See Appendix F. Table F.3).

Discriminant validity was examined using chi-square different tests between an unconstrained model and constrained models (Anderson & Gerbing, 1988). For example, by setting a correlation to 1 between two constructs (e.g., visual fluency and perceived aesthetics: constrained model), this constrained model can be compared to the unconstrained model. When the chi-square difference test is significant, discriminant validity is achieved between two constructs (Bagozzi & Phillips, 1982). Since all chi-square difference tests were significant in this study (See Table 2.4), discriminant validity between constructs was established. In addition to chi-square different test, discriminant validity can be examined using the confidence interval (CI) of correlation coefficients of latent variables, and 95% of confidence interval not including 1.0 indicates the evidence of discriminant validity. As shown in Table 2.5, all confidence intervals did not include 1.0, thus achieving discriminant validity.

Table 2.4. Chi-square difference tests for discriminant validity

Constraint	$\chi 2$	*df*	$\Delta\chi 2$	Δdf
Unconstrained model	50.50	14		
Visual fluency ↔ Perceived aesthetics	58.08	15	7.58**	1
Visual fluency ↔ Preference	73.84	15	23.34***	1
Visual fluency ↔ Behavioral intentions	165.55	15	115.05***	1
Perceived aesthetics ↔ Preference	266.86	15	216.36***	1
Perceived aesthetics ↔ Behavioral intentions	499.01	15	448.51***	1
Preference ↔ Behavioral intentions	488.24	15	437.74***	1

Note. *$p < .05$, **$p < .01$, ***$p < .001$;
$\Delta\chi 2 = \chi 2$ (constrained) - $\chi 2$ (unconstrained); $\Delta df = df$ (constrained) – df (unconstrained)

Table 2.5. Correlation coefficients and confidence interval for discriminant validity

	Correlation coefficient	*SE*	Confidence interval	
Visual fluency ↔ Perceived aesthetics	.979	.008	.963	.995
Visual fluency ↔ Preference	.958	.009	.940	.976
Visual fluency ↔ Behavioral intentions	.874	.014	.846	.902
Perceived aesthetics ↔ Preference	.954	.004	.952	.968
Perceived aesthetics ↔ Behavioral intentions	.888	.010	.868	.908
Preference ↔ Behavioral intentions	.896	.009	.878	.914

Hypotheses Testing

In this research, the effects of home page design on visual fluency and perceived aesthetics, moderating effects of brand familiarity and CVPA on visual fluency and perceived aesthetics were described in Part I (Hypotheses 1 to 4). Also, relationships among consumers' internal states and their responses were presented in Part II (Hypotheses 5 to 10) (See Figure 2.3).

Part I: Multivariate Analysis of Variance

Part I was tested by using 2 (home page design: image-oriented vs. text-oriented) x 2 (brand familiarity: familiar vs. unfamiliar) and 2 (home page design: image-oriented vs. text-oriented) x 2 (CVPA: high vs. low) between-subject multivariate analyses of variance.

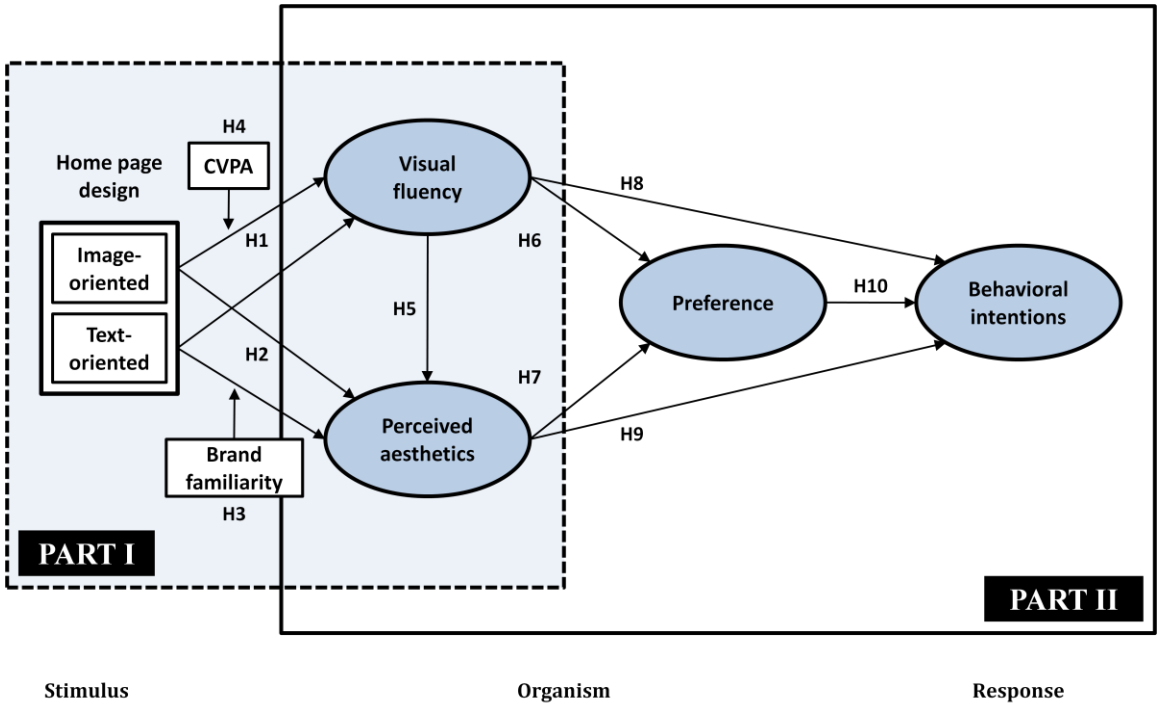

Figure 2.3. Proposed model of the study

Hypotheses Testing

Table 2.6. Hypotheses 1 through 4

	Hypotheses
H1	*As compared to those exposed to a text-oriented home page, people who are exposed to an image-oriented home page will perceive that the home page is more visually fluent.*
H2	*As compared to those exposed to a text-oriented home page, people who are exposed to image-oriented home page will perceive a higher level of aesthetics.*
H3	*Brand familiarity will moderate the relationship between website design and consumer responses (a: visual fluency, b: perceived aesthetics).*
H4	*CVPA will moderate the relationship between website design and consumer responses (a: visual fluency, b: perceived aesthetics).*

First, a 2 (home page design: image-oriented vs. text-oriented) x 2 (brand familiarity: familiar vs. unfamiliar) between-subject multivariate analysis of variance was performed to test hypotheses. There were significant multivariate main effects for home page design on visual fluency and on perceived aesthetics [Wilks' $\lambda = .28$. F (2, 653) = 840.74, $p < .001$, partial $\eta^2 = .72$]. A follow-up analysis of variance was performed to determine which dependent variables were affected by the home page design. The results showed that there were significant main effects for home page design on visual fluency [F (1, 654) = 1256.16, $p < .001$, partial $\eta^2 = .66$] and on perceived aesthetics [F (1, 654) = 1509.69, $p < .001$, partial $\eta^2 = .70$]. Participants who were exposed to an image-oriented home page experienced greater visual fluency ($M = 5.59$, $SD = .95$) than those exposed to a text-oriented home page ($M = 2.57$, $SD = 1.20$). Furthermore, they experienced the home page as more attractive ($M = 5.25$, $SD = 1.24$) when they were exposed to an image-oriented home page than when they were exposed to a text-oriented home page ($M = 1.91$, $SD = .97$). Therefore H1 and H2 were supported. The results of MANOVA and ANOVA are described in Table 2.7 and Table 2.8, and descriptive statistics are summarized in Table 2.9.

Table 2.7. Multivariate analysis for home page design on visual fluency and perceived aesthetics

	Wilks' λ	F (2, 653)	p	Partial Eta^2
2 (home page design: image-oriented vs. text-oriented) x 2 (brand familiarity: familiar vs. unfamiliar)				
home page design	.28	840.74	.000***	.72
brand familiarity	.99	3.17	.043**	.01
home page design x brand familiarity	.99	.51	.603	.00
2 (home page design: image-oriented vs. text-oriented) x 2 (CVPA: high vs. low)				
home page design	.28	860.98	.000***	.73
CVPA	.99	2.30	.101	.01
home page design x CVPA	.97	10.90	.000***	.03

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

Table 2.8. Results of analysis of variance

		F (1, 654)	p	Partial Eta^2
Visual fluency	home page design$_{\text{(design x brand familiarity)}}$	1256.16	.000***	.66
	home page design$_{\text{(design x CVPA)}}$	1265.04	.000***	.66
	home page design x CVPA	3.76	.053	.01
Perceived aesthetics	home page design$_{\text{(design x brand familiarity)}}$	1509.69	.000***	.70
	home page design$_{\text{(design x CVPA)}}$	1556.47	.000***	.70
	brand familiarity	4.23	.040*	.01
	home page design x CVPA	20.13	.000***	.03

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

Table 2.9. Summary table of descriptive information for main effects of home page design and brand familiarity

	Main effect of home page design		Main effect of brand familiarity	
	Image-oriented	Text-oriented	Familiar	Unfamiliar
Visual fluency	**5.59 (.95)**	**2.57 (1.20)**	3.93 (1.84)	4.03 (1.88)
Perceived aesthetics	**5.25 (1.24)**	**1.91 (.97)**	**3.29 (2.05)**	**3.34 (1.95)**

Note. First values represent means and values enclosed in parentheses represent standard deviations. Significant effects were represented in bold numbers

Although main effects for brand familiarity on visual fluency and on perceived aesthetics were not predicted in this study, multivariate main effects were significant from the analysis [Wilks' λ = .99. F (2, 653) = 3.17, p < .05, partial η^2 = .01]. Results of analysis of variance further revealed that brand familiarity significantly influenced perceived aesthetics [F (1, 654) = 4.23, p < .05, partial η^2 = .10]. According to cell means, participants who were exposed to an unfamiliar brand perceived the website home page as more attractive (M = 3.59, SD = 2.05) than those exposed to a familiar brand (M = 3.34, SD = 1.95). However, interaction effects of home page design by brand familiarity were not significant. Thus, H3 addressing moderating effects of brand familiarity was not supported.

Hypothesis 4 was tested using 2 (home page design: image-oriented vs. text-oriented) x 2 (CVPA: high vs. low) between-subject multivariate analyses of variance. The results showed multivariate main effects for home page design on visual fluency and on perceived aesthetics [Wilks' λ = .28. F (2, 653) = 860.98, p < .001, partial η^2 = .73]. A follow-up analysis of variance also revealed that there were significant main effects for home page design on visual fluency [F (1, 654) = 1493.28, p < .001, partial η^2 = .66] and on perceived aesthetics [F (1, 654) = 1566.47, p < .001, partial η^2 = .70]. The results of main effects for home page design were consistent with the 2 (home page design: image-oriented vs. text-oriented) x 2 (brand familiarity: familiar vs. unfamiliar) multivariate analysis of variance.

The results of MANOVA also showed that there were multivariate interaction effects of home page design by CVPA [Wilks' λ = .97. F (2, 653) = 10.90, p < .001,

partial $\eta^2 = .03$]. Therefore, a follow-up ANOVA was performed to determine which dependent variables were affected by the home page design by CVPA. The results showed that there were significant interaction effects of home page design by CVPA on visual fluency [F (1, 654) = 3.76, $p = .05$, partial $\eta^2 = .01$] and on perceived aesthetics [F (1, 654) = 23.68, $p < .001$, partial $\eta^2 = .03$].

Simple effects tests further indicated that the effect of home page design on visual fluency was significant for the participants in both high [F (1, 654) = 701.03, $p < .001$, partial $\eta^2 = .52$] and low CVPA groups [F (1, 654) = 567.32, $p < .001$, partial $\eta^2 = .47$]. In addition, the effect of home page design on perceived aesthetics was significant for participants in both high [F (1, 654) = 962.16, $p < .001$, partial $\eta^2 = .60$] and low CVPA groups [F (1, 654) = 613.30, $p < .001$, partial $\eta^2 = .48$] (See Figure 2.4). Participants in both CVPA groups experienced greater visual fluency when a home page design was image-oriented ($M_{high\ CVPA} = 5.71$, $SD_{high\ CVPA} = .96$; $M_{low\ CVPA} = 5.47$, $SD_{low\ CVPA} = .92$) than when a home page design was text-oriented ($M_{high\ CVPA} = 2.52$, $SD_{high\ CVPA} = 1.22$; $M_{low\ CVPA} = 2.61$, $SD_{low\ CVPA} = 1.18$). Furthermore, they also perceived the image-oriented home page as more attractive ($M_{high\ CVPA} = 5.53$, $SD_{high\ CVPA} = 1.21$; $M_{low\ CVPA} = 4.97$, $SD_{low\ CVPA} = 1.20$) than the text-oriented home page ($M_{high\ CVPA} = 1.80$, $SD_{high\ CVPA} = .93$; $M_{low\ CVPA} = 2.01$, $SD_{low\ CVPA} = .99$) (See Table 2.10). Therefore, H4 predicting moderating effects of CVPA was supported.

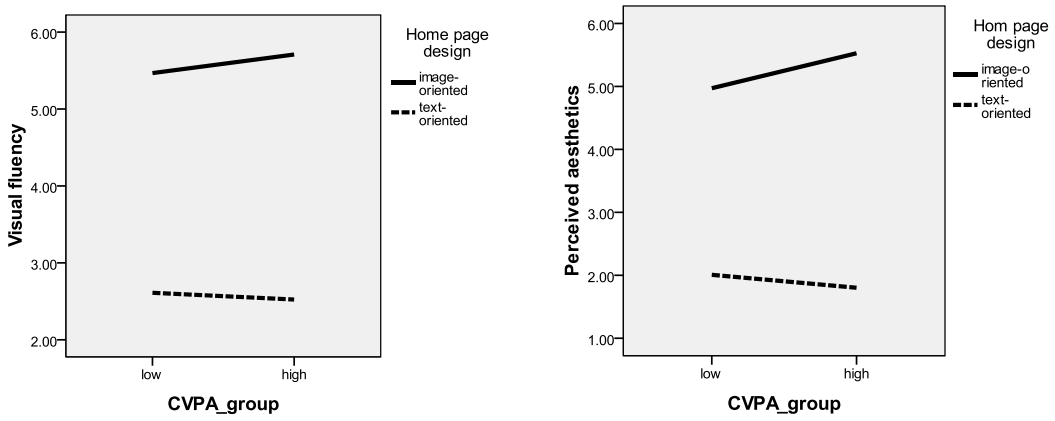

Figure 2.4. Home page design by CVPA interaction effects on visual fluency and perceived aesthetics

Table 2.10. Summary table of descriptive information for interaction effects of home page design x CVPA

	Image-oriented home page		Text-oriented home page	
	High CPVA	Low CVPA	High CVPA	Low CPVA
Visual fluency	5.71 (.96)	5.47 (.92)	2.52 (1.22)	2.61 (1.18)
Perceived aesthetics	5.53 (1.21)	4.97 (1.20)	1.80 (.93)	2.01 (.99)

Part II: Structural Equation Modeling

Part II establishes the relationships among visual fluency, perceived aesthetics, preference, and behavioral intentions. Visual fluency was an exogenous latent variable and other variables were endogenous variables. By pooling across experimental groups, a structural equation modeling was performed with a single group to test hypotheses 5 to 10. Maximum likelihood function was utilized to estimate parameters of structural

equation model and to test relationships among variables using AMOS 18.0. One loading on each latent variable was set to 1.0 (Bae, 2007).

Model Fit

An overall chi-square was 50.50 (df = 14, p < .001). The NFI was .99, CFI was .99, IFI was .99, and TLI was .99. The RMSEA was .063 with 90% confidence interval of .045 and .082. Even though chi-square statistic was significant due to the large sample size (N = 658), other fit indices suggest an acceptable fit to the data.

Hypotheses Testing

Hypothesis 5: There will be a positive relationship between visual fluency of a home page and perceived aesthetics of the home page.

Hypothesis 5 proposed that visual fluency of a home page will be positively associated with perceived aesthetics of the home page. The results showed significant positive relationships between visual fluency and perceived aesthetics (γ_{11} = .98, t = 38.19, p < .001) (See Figure 2.5 & Table 2.11), implying that the greater the visual fluency on a home page, the greater the aesthetics of the home page was perceived to be. Therefore, H5 was supported.

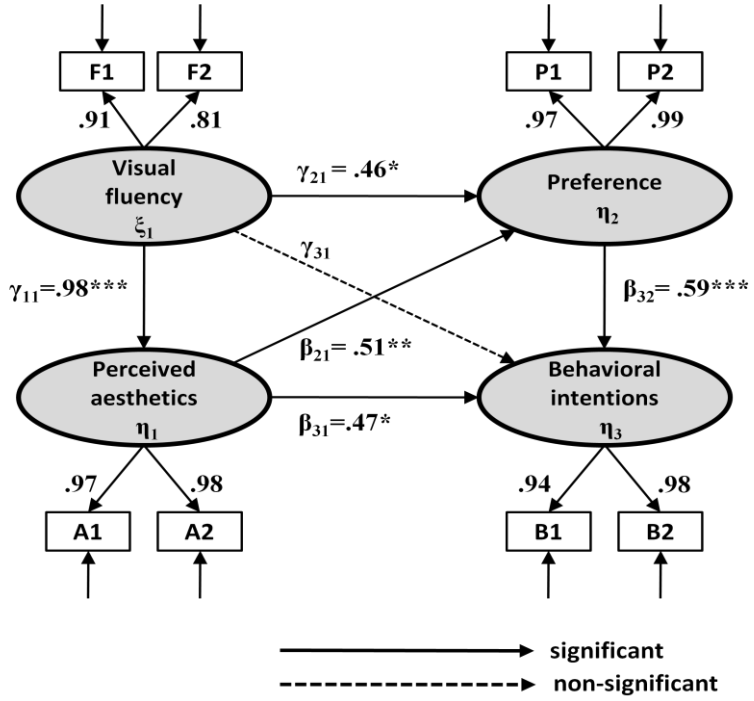

Figure 2.5. Standardized estimates and significance tests for H5 to H10
(*p < .05, **p < .01, ***p < .001)

Table 2.11. Results from the SEM for testing hypotheses

Hypotheses		Parameter	Est.	*SE*	*t*
Structural path					
H5	Visual fluency (ξ_1) → Perceived aesthetics (η_1)	γ_{11}	.98	.03	38.19***
H6	Visual fluency (ξ_1) → Preference (η_2)	γ_{21}	.46	.22	2.31*
H7	Perceived aesthetics (η_1) → Preference (η_2)	β_{21}	.51	.18	2.63**
H8	Visual fluency (ξ_1) → Behavioral intentions (η_3)	γ_{31}	-.15	.26	-.65
H9	Perceived aesthetics (η_1) → Behavioral intentions (η_3)	β_{31}	.47	.19	2.33*
H10	Preference (η_2) → Behavioral intentions (η_3)	β_{32}	.59	.10	6.01***
Model fit					
	Chi-square	50.50	*df* = 14		
	RMSEA	.063	90% C. I. (.045; .082)		
	TLI	.99			
	NFI	.99			
	CFI	.99			
	IFI	.99			

Hypothesis 6: There will a positive relationship between visual fluency of a home page and preference for the website.

Hypothesis 6 posited a positive association between visual fluency of a home page and preference for the website. The results revealed a significant positive relationship between visual fluency and preference (γ_{21} = .46, t = 2.31, p < .05), supporting H6. Participants who experienced greater visual fluency on a home page perceived greater aesthetics on the home page.

Hypothesis 7: There will be a positive relationship between perceived aesthetics of a home page and preference for the website.

Hypothesis 7 predicted a positive relationship between perceived aesthetics and preference. Structural path coefficients found that perceived aesthetics of a home page was positively related to preference for the website (β_{21} = .51, t = 2.63, p < .01). Participants who perceived a home page as more attractive liked the website better than those perceived a home page as less attractive. Therefore, H7 was supported.

Hypothesis 8: There will be a positive relationship between visual fluency of a home page and consumers' behavioral intentions.

Hypothesis 8 addresses a positive relationship between visual fluency of a home page and behavioral intentions. However, the results revealed that there was no significant relationship between visual fluency and behavioral intentions (γ_{31} = -.15, t = -.65, p = .52), failing to support H8.

Hypothesis 9: There will be a positive relationship between perceived aesthetics of a home page and consumers' behavioral intentions.

Hypothesis 9 examining a relationship between perceived aesthetics and behavioral intentions was supported. The result showed a significant coefficient (β_{31} = .47, t = 2.33, p < .05). Participants who perceived a home page design as more attractive had greater behavioral intentions than those who perceived a home page design as less attractive.

Hypothesis 10: There will be a positive relationship between consumers' preference for a website and their behavioral intentions.

Hypothesis 10 postulated a positive association between preference and behavioral intentions. The results revealed a significant positive relationship between preference for a website and behavioral intentions (β_{32} = .59, t = 6.01, p < .001), implying that participants who liked the website better had greater behavioral intentions. Therefore, H10 was supported.

Direct and Indirect Effects

Based on the hypothesized model (See Figure 2.5), it is possible to consider that visual fluency affected preference directly (γ_{21} = .46) but also affected it indirectly through perceived aesthetics ($\gamma_{11}\beta_{21}$ = .50). As shown in Table 2.12 the direct effect from visual fluency to preference was significant, but indirect effects to preference through

perceived aesthetics were not significant. Therefore, visual fluency only affected preference directly.

Table 2.12. Decomposition of direct, indirect, and total effects for the hypothesized model

Dependent variable	Predictor variable	Indirect effect	Direct effect	Total effect
Preference	Visual fluency	.50	.46*	.96*
	Perceived aesthetics		.51*	.51*
Behavioral intentions	Visual fluency	1.02*	-.15	.87*
	Perceived aesthetics	.30	.47*	.77*
	Preference		.59*	.59*

Note. *$p < .05$

Decomposition of effects also revealed direct and indirect effects from visual fluency to behavioral intentions. The total effects of visual fluency on behavioral intention (.87) were calculated by the sum of the direct effect ($\gamma_{31} = -.15$) and the indirect effects ($\gamma_{11}\beta_{31} + \gamma_{21}\beta_{32} + \gamma_{11}\ \beta_{21}\beta_{32} = 1.02$). Results showed that visual fluency only affected behavioral intentions indirectly because direct effect of visual fluency on behavioral intentions was not significant. The strongest relationships of the indirect effects were visual fluency – perceived aesthetics – behavioral intentions ($\gamma_{11}\beta_{31} = .46$). Therefore, perceived aesthetics and preference were perfect mediators of the relationship between visual fluency and behavioral intentions.

The model further revealed direct and indirect effects from perceived aesthetics to behavioral intentions. The total effects of perceived aesthetics on behavioral intentions (.77) consisted of the direct effect ($\beta_{31} = .47$) and the indirect effects through preference

($\beta_{21}\beta_{32}$ = .30). However, perceived aesthetics only affected behavioral intentions directly because the indirect effects through preference were not significant.

Part III: Additional Analyses

The purpose of Part III was to investigate whether the structural relationships examined in Part II differ as a function of brand familiarity and a level of CVPA. Multi-group SEM was conducted after constraining the regression coefficients of the path addressing hypotheses in Part II.

Brand familiarity

Firstly, multi-group analysis for the effect of brand familiarity was performed. A based model with two groups (familiar brand and unfamiliar brand) with no constraints was tested and found to be a good fit based on the RMSEA and incremental fit indices (χ^2 = 61.43, *df* = 28; RMSEA = .043; NFI = .99; IFI = .99; TLI = .99; CFI = .99). The next step was to assess invariance of latent factor loadings for both groups to investigate whether the measurement model was equally valid across the groups. The factor loadings were constrained to be equal across groups, and a chi-square different test was used between the base model and the constrained model. Result showed that the two models were not significantly different ($\Delta\chi^2$ = 7.82, Δdf = 4, p > .05), indicating the constrained model was superior, and all factor loadings were the same for both groups.

Since the constrained model of factor loadings was retained, invariance of path coefficients was tested using chi-square different tests. For example, in order to examine

the relationship between visual fluency and perceived aesthetics between a group with familiar brand and the other group with unfamiliar group, all factor loadings and a path coefficient from visual fluency to perceived aesthetics were constrained to be equal across the groups (i.e., all factor loadings and γ_{11} in Group 1 = γ_{11} in Group 2), and then this constrained model was compared to a constrained model of factor loadings. Table 2.13 shows results of a series of multi-group SEM. The model fit comparison between the two groups was significantly different for path coefficient estimates for the relationship between visual fluency and perceived aesthetics and between visual fluency and preference, indicating the less constrained model is superior. Thus, path coefficients are different between people exposed to a familiar brand and people exposed to an unfamiliar brand.

Table 2.13. Multi-group analyses for the effects of brand familiarity

Equality constraints	χ^2	*df*	$\Delta\chi^2$	Δdf	Sig.	Invariant
Base model (no constrains)	61.43	28				
Constrained model[1] (factor loadings)	66.31	32	7.82	4	ns	Yes
Constrained model[2] (factor loadings + path coefficients)						
FL + Visual fluency → Perceived aesthetics	67.93	33	1.62	1	**	No
FL + Visual fluency → Preference	73.04	33	6.74	1	**	No
FL + Perceived aesthetics → Preference	73.04	33	6.74	1	ns	Yes
FL + Visual fluency → Behavioral intentions	66.31	33	.00	1	ns	Yes
FL + Perceived aesthetics → Behavioral intentions	33.31	33	.00	1	ns	Yes
FL + Preference → Behavioral intentions	66.32	33	.01	1	ns	Yes

Note. $\Delta\chi 2 = \chi 2$ (constrained model [2]) - $\chi 2$ (constrained model [1]); $\Delta df = df$ (constrained model [2]) – df (constrained model [1])

A level of centrality of visual product aesthetics

Another multi-group SEM was conducted to investigate whether the structural relationships examined in Part II differ as a function of a level of centrality of visual

product aesthetics (CVPA). A based model with two groups (low CVPA group and high CVPA group) with no constraints was tested and compared to a constrained model of latent factor loadings. A base model was found to be a good fit ($\chi^2 = 69.21$, $df = 28$; RMSEA = .047; NFI = .99; IFI = .99; TLI = .99; CFI = .99), and results of a chi-square difference test between the base model and the constrained model revealed that the two models were not significantly different ($\Delta\chi^2 = 4.01$, $\Delta df = 4$, $p > .25$). Thus, the constrained model was superior, and all factor loadings were the same for both groups.

The next step was to assess invariance of path coefficients by constraining all factor loadings and a path coefficient of each relationship to be equal across the groups. The results of a series of multi-group SEM were summarized in Table 2.14. All relationships in Part II did not significantly differ depending on the CVPA groups, implying that constrained models of all factor loadings and path coefficients were superior to the constrained model of factor loadings. Thus, it can be concluded that path coefficients are the same between high CPVA group and low CVPA group.

Table 2.14. Multi-group analyses for the effects of CVPA

Equality constraints	χ^2	*df*	$\Delta\chi^2$	Δdf	Sig.	Invariant
Base model (no constrains)	69.21	28				
Constrained model[1] (factor loadings)	73.29	32	4.08	4	ns	Yes
Constrained model[2] (factor loadings + path coefficients)						
FL + Visual fluency → Perceived aesthetics	76.97	33	3.68	1	ns	Yes
FL + Visual fluency → Preference	74.74	33	1.45	1	ns	Yes
FL + Perceived aesthetics → Preference	74.33	33	1.04	1	ns	Yes
FL + Visual fluency → Behavioral intentions	73.41	33	.12	1	ns	Yes
FL + Perceived aesthetics → Behavioral intentions	73.68	33	.39	1	ns	Yes
FL + Preference → Behavioral intentions	73.34	33	.05	1	ns	Yes

Note. $\Delta\chi 2 = \chi 2$ (constrained model [2]) - $\chi 2$ (constrained model [1]); $\Delta df = df$ (constrained model [2]) – df (constrained model [1])

DISCUSSION AND CONCLUSION

Summary and Conclusion

Home pages have been considered significant in affecting company or brand image (Lindgaard et al., 2006; Schenkman & Jönsson, 2000). According to Schenkman and Jönsson, (2000), consumers' use of a website is determined by diverse factors, but first impression of the website is the most important aspect in making the users continue to use the site. In addition, a positive impression obtained on a home page can draw attention away from potential negative issues which may occur later (Campbell & Pisterman, 1996).

One characteristic of home page design affecting user preference and overall impression is aesthetics or visual appeal of information presentation, and this study focused on image-oriented and text-oriented home page designs. The purposes of this study were: (1) to examine effects of home page design on visual fluency and perceived aesthetics; (2) to investigate how the effects of home page design on consumer responses vary as a function of brand familiarity; (3) to explore if the effects of home page design are different based on an individual difference, CVPA; and (4) to examine relationships among consumer responses, such as visual fluency, perceived aesthetics, preference, and behavioral intentions.

This research was guided by the stimulus – organism – response (SOR) model as a theoretical framework (Mehrabian & Russell, 1974). The SOR model addressed how

home page design (S) on websites influence consumers' behavioral intentions (R), and consumers' affective and cognitive internal states, such as preference, (O) mediate the relationship between stimulus (S) and response (R). The proposed model in the study was examined by conducting an experiment using four different types of mock apparel home pages.

The Effects of Home Page Design

Two aspects of home page design examined in this study were image-oriented and text-oriented home page. Since this study had two moderators, brand familiarity and CVPA, two 2 x 2 between-subject multivariate analysis of variance were performed: (1) 2 (home page design: image-oriented vs. text-oriented) x 2 (brand familiarity: familiar vs. unfamiliar) and (2) 2 (home page design: image-oriented vs. text-oriented) x 2 (CVPA: high vs. low). As expected, results from both MANOVAs revealed that when people were exposed to an image-oriented home page, they perceived the home page to be more visually fluent and more attractive than a text-oriented home page. The results are consistent with previous research. According to Reber et al. (2004), visual fluency can be influenced by visual clarity and presentation forms, and visual images are dominant in encoding and processing information (Hodes, 1994; Wiebe & Howe, 1998). An empirical study also found that image-oriented and colorful home pages were more effective in influencing consumers' aesthetic perceptions than text (Hartmann et al., 2007).

This study contributes by providing empirical evidence about home page design in an online shopping context. In general, home pages contain a minimal amount of

information. For example, e-retailers try to show latest fashion trends using a big visual image with a few navigational links and a search engine. Therefore, consumers do not spend much time in home pages, and attempt to go other pages to search for information they need. Online shoppers who are exposed to a home page may decide to enter product pages or to switch to another website for more information, depending on the impression being created on the home page. When an image-oriented home page is displayed, consumers may process information more easily and they perceive the home page as more attractive than when a text-oriented home page is presented. In this regard, conveying positive impression and favorable brand image using visual images may be important in affecting other consumer responses.

Moderating Effects of Brand Familiarity

Moderating effects of brand familiarity on visual fluency and perceived aesthetics were not supported. Therefore, the effects of home page design on the consumer responses did not differ either when a brand is familiar or unfamiliar. However, even though main effects for brand familiarity on consumer responses were not predicted in this study, brand familiarity significantly influenced perceived aesthetics. Participants who were exposed to an unfamiliar brand perceived the website home page as more attractive than those exposed to a familiar brand. The result is not consistent with Zizak and Reber (2004)'s explanation that people do not like a new form of art because of unfamiliarity. For example, people were opposed to impressionist paintings at first, but they started to eulogize Impressionism after they became familiar with the new art form.

However, this explanation was not applied to the effects of brand familiarity on perceived aesthetics. The result suggests that people may be influenced by their existing images about a brand when they shop online. When people are not familiar with a brand, they only evaluate the website design without any biased ideas about the brand.

Additional analysis of multi-group SEM was conducted to investigate if the structural relationships among consumer responses differ when the brand is familiar or unfamiliar. The results revealed that relationships between visual fluency and perceived aesthetics and between visual fluency and preference were different depending on brand familiarity. When a brand is familiar, the positive relationships between visual fluency and perceived aesthetics and between visual fluency and preference are significant. However, when a brand is unfamiliar, a positive relationship between visual fluency and perceived aesthetics was significant, but a positive relationship between visual fluency and preference was not significant. In other words, when a brand is unfamiliar, visual fluency on a home page did not affect preference of the website, which suggests that home page alone cannot make consumers like the website. Thus, other aspects, such as product presentation, are also important to make consumers like the website when a brand is unfamiliar.

Moderating Effects of Centrality of Visual Product Aesthetics

Moderating effects of centrality of visual product aesthetics (CVPA) on the relationship between home page design and visual fluency and between home page design and perceived aesthetics were significant. The results showed that when people

were exposed to an image-oriented home page, people in a high CVPA group experienced greater visual fluency and perceived the home page as more attractive than those in a low CVPA group. However, even though the effect of image-oriented home page was much more significant for the high CVPA people, both groups preferred an image-oriented home page to a text-oriented home page. People in both groups experienced greater visual fluency in an image-oriented home page than in a text-oriented home page. In addition, people in both groups perceived an image-oriented home page as more attractive than a text-oriented home page.

The results were congruent with previous studies (Bloch et al., 2003; Hartmann et al., 2007). Hartmann et al. found that user evaluations of website aesthetics were different between individuals with a high level of CVPA and with a low level of CVPA. Since people with high CVPA are more concerned with visual aesthetics than people with low CVPA, people with high CVPA showed greater visual fluency and perceived aesthetics when a home page design was image-oriented.

However, additional analysis of multi-group SEM revealed that the structural relationships examined among consumer responses did not differ both when people are in a high and a low CVPA groups. Therefore, it is important to for e-retailers in influencing consumers' visual fluency and perceived aesthetics to generate other positive responses, such as preference and behavioral intentions.

Even if people in a high CVPA group were more influenced by image-oriented home page design than people in a low CVPA group, both groups showed more desirable responses toward an image-oriented home page than toward a text-oriented home page.

Thus, image-oriented home page designs play a key role in affecting preference and behavioral intentions through visual fluency and perceived aesthetics.

The Relationships among Consumer Responses

Structural equation modeling was used to examine Part II of the proposed model. The findings supported the hypothesis that visual fluency positively affected perceived aesthetics and preference. The findings are also supported by prior research examining the effect of visual fluency on perceived aesthetics and preference (Reber et al., 2004; Reber et al., 1998; Winkielman et al., 2003). Those studies found that people evaluated visually fluent stimuli as more attractive than less visually fluent stimuli. Also, people showed preference for the visually fluent stimuli. In an online home page, when people perceive the home page as visually fluent and when people consider the information as easy to process, they experience aesthetic appeal and like the home page. Further investigation of direct and indirect effects showed that visual fluency only influenced preference directly, and indirect effect of visual fluency on preference through perceived aesthetics was not significant.

However, a positive relationship between visual fluency and behavioral intentions was not significant, failing to support Im and Stoel's (2007) findings. The researchers showed that consumers' perceptual fluency, influenced by visual stimuli on an apparel website, influenced their behavioral intention and patronage intention. Although the relationship was not supported in this study, decomposition of effects revealed that perceived aesthetics and preference were perfect mediators of the relationship between

visual fluency and behavioral intentions. In other words, visual fluency only influenced behavioral intentions indirectly through perceived aesthetics or preference. Therefore, it can be concluded that visual fluency affects behavioral intentions depending on consumers' aesthetics perception and their preference of the website.

Relationships between perceived aesthetics and preference and between perceived aesthetics and behavioral intentions have been also discussed in past research (Hall & Hanna, 2004; Schenkman & Jönsson, 2000), and this study found results consistent with that research. People who had greater aesthetic perceptions liked the website better and also had greater behavioral intentions than those who had less aesthetic perceptions. Further investigation of direct and indirect effects showed that perceived aesthetics only influenced behavioral intentions directly, and indirect effect of perceived aesthetics on behavioral intentions through preference was not significant.

As expected, the results from the hypothesized model also supported a positive relationship between preference and behavioral intentions. The result is consistent with previous studies (Bower et al., 2003; Suh & Yi, 2006). Suh and Yi found that consumers' behavioral intentions were largely influenced by their degree of preference. In this study, when consumers liked the website, they had intentions to further browse the website and to revisit the website in the future.

Implications

Theoretical Implications

The study supports previous literature of information presentation formats (Mark & Dulaney, 1998; Vora, 1998). According to Mark and Dulaney, processing verbal information takes more time than processing visual information because people process information as their eyes move. When eyes move, there are fixed moments on a part of the text, and information obtained from verbal texts is combinations of the fixed moments. Since people select information based on their fixed moments, the researchers suggested including visual displays using colors on a website for effective information processing for consumers. The findings of this study provide empirical support of visual and verbal information processing. An image-oriented home page design was considered much easier to process than a text-oriented home page design, thus influencing visual fluency.

This study found that consumers evaluate the home pages based on the overall features, such as images or text presented, and the findings support the gestalt theory (Arnheim, 1983). According to the theory, people recognized website appearance as a whole rather than identifying its individual components (e.g., background color, fonts, or text colors). Based on the overall appearance of the home pages, consumers form a certain impressions about the online retailers, and the impressions lead consumers to like or dislike the websites. The gestalt theory has mostly been applied to the concept of product design (Papanek, 1984). However, its application to visual merchandising in

online retailing is rare. Thus, the current research provided additional empirical evidence of the gestalt theory in an online shopping context.

The stimulus-organism-response (SOR) model provided the theoretical framework for the proposed model (Mehrabian & Russell, 1974). The theory addresses how environmental stimuli (S) influence consumers' behavioral responses (R) and consumers' affective and cognitive states mediate the relationship between environmental stimuli (S) and responses (R). In the present study, home page designs (S) influenced consumers' behavioral intentions (R), and consumers' preference of the website mediated the relationship between home page designs and behavioral intentions, supporting the SOR model.

Bloch et al. (2003) explained a concept of centrality of visual product aesthetics (CVPA). According to the researchers, people in a high CVPA group consider visual aesthetics of products as more important than do people in a low CVPA group. With regard to the moderating effects of CVPA, the researchers suggested that CVPA is an individual difference moderating a relationship between stimuli and consumer responses, such as visual fluency and aesthetic perceptions, and the present study provides empirical evidence to the literature of CVPA. This study found that, compared to consumers with low CVPA scores, consumers with high CVPA scores experienced greater visual fluency and perceived the image-oriented home page design as more attractive.

Managerial Implications

According to past research, visual images play an important role in creating positive impressions about the retailers (Tractinsky & Lowengart, 2007). Online shoppers view a home page of a website before they enter product pages, and then they may form certain images about the online store from the home page. While a home page plays a key role in creating the first impression of an online retailer, little scholarly attention has been given to web home pages. Therefore, it was important to investigate effects of home page design on consumer responses.

This study used an image-oriented home page and text-oriented home page to examine consumer responses, and suggests that online apparel retailers present visual images on a home page. Along with a study by Park et al. (2005), noting that a home page is often evaluated by visual representation factors, the present study showed that an image-oriented home page influenced visual fluency and aesthetic perception, which in turn affected preference of the website and behavioral intentions. Visual fluency may play a role especially on a home page in affecting consumers because they tend to process information available on the home page very quickly and decide to go to product pages or to switch to another site. Considering the effects of visual fluency on other responses, such as aesthetic perception, preference of a website, and behavioral intentions, increasing visual fluency on a home page is critical.

Roles of centrality of visual product aesthetics (CVPA) were discussed in this study. The degree of consumer responses including visual fluency and perceived aesthetics to an image-oriented home page was different between people in a high and a

low CVPA groups. However, both groups preferred the image-oriented home page to the text-oriented home page. Therefore, even when the individual difference was considered, visual images on a home page are important in generating desirable consumer responses.

What was interesting to note from this study is one surprising effect of brand familiarity. This study predicted that people tend to rely more on brand name in a non-store shopping context (Hoch & Ha, 1986). However, the findings showed that consumers tend to consider the home page more attractive when a brand is unfamiliar. A possible explanation is that other factors, such as consumers' prior experiences with the brand or images of the brand, influenced their responses toward the website. Therefore, consumers' positive impressions and experiences in an offline store should be step ahead to be successful online retailers. In addition, the result provides practical implications for e-retailers of unknown brands. Since consumers do not have prior knowledge about the brand, they tend to evaluate the website based only on the website design. Therefore, creating a visually fluent and appealing home page may be important for e-retailers of unknown brands to attract consumers and to make them browse the website.

In conclusion, this study contributes by providing a home page design in an online shopping context. Since consumers do not spend much time in an online home page, it is important for e-retailers to attract consumers' attention using visual images. In particular, when a brand is familiar, people tend to skip the home page and directly browse product pages. Therefore, presenting proper images such as fashion trends or promotion information may be useful. When a brand is unfamiliar, people may stay longer than they do on a home page of a familiar brand. Using visually appealing images rather than

presenting text is a possible way to improve positive impressions and intention to browse the website.

Limitation and Future Research

This study entails several limitations. This study focused on female college students' responses to online product presentation. While this group comprises a major portion of online shoppers for apparel, they may not be the sole representative of all shoppers. Thus future research needs to include more diverse group of Internet shoppers for generalizability of the findings.

This study examined moderating effects of brand familiarity on the relationship between home page design and consumer responses. However, when brand familiarity was manipulated, consumers' preexisting brand images which may influence the consumer responses were not considered. Even if consumers are familiar with a brand, if they have a bad experience with the brand, then it may impossible to get desired responses on a home page. Therefore, positive and negative brand images may be another factor to consider as a moderator in the future research.

In order to investigate effects of home page design on consumer responses, other aspects on a home page should be considered in addition to image- vs. text-oriented designs. For example, the use of flash designs, video clips, downloading time, or promotion information may enhance consumers' first impressions about the website, which finally influence their intention to browse product pages on the website. Therefore,

it would be worthwhile to conduct future research by manipulating other design aspects on a home page.

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CHAPTER 3

The Effects of Online Product Presentation on Consumer Responses: Mental Imagery Perspective

INTRODUCTION

Online retailing has grown rapidly in recent years. Estimated US e-commerce sales revenue reached $165.9 billion in 2007, a 21.8% increase from 2006 (Internet Retailer, 2008). Among popular product categories sold online, apparel was the third largest in 2001(Marketwire, 2002), and the biggest category of online shopping by revenue during the holiday period in 2003 and 2004 (Internet Retailer, 2005a). Consumers spent $3.8 billion on apparel from November to the second week in December in 2004, which was 16% of the total online revenue. eMarketer (2006) also reported sales revenue during the holiday period in 2005, where online shoppers spent the most on apparel items: $5.3 billion, a 43% increase from 2004. Because of the conveniences of online shopping such as saving time and unlimited accessibility (Then & Delong, 1999), more and more consumers have adopted the online medium for apparel shopping.

However, despite its growing popularity among the general public, evidence suggests that many consumers are still reluctant to purchase online. According to Forrester Research, more than a quarter of online shoppers still will not buy online due to concerns related to privacy and security and also to the inability to physically examine an

item prior to purchase (Internet Retailer, 2005b). Especially for products like apparel that require sensory evaluation, consumers' attitudes toward apparel sold online tend to be more negative compared to their attitudes toward products like books and computer software that do not require sensory evaluations (Shim, Eastlick, & Lotz, 2000). Extant online shopping research suggests that the use of technology enhancing realistic sensory experiences (Shim et al., 2000) and effective visual merchandising techniques (Khakimdjanova & Park, 2005) are essential to satisfy a consumer's need for direct touch of apparel products when shopping online.

Given the importance of sensory product evaluation for online apparel shopping, how apparel products are presented on a retail website is likely to have a crucial impact on consumer purchase decisions. Then and Delong (1999) attested the important role of online product presentation in positively influencing online shoppers' purchase intention. Yet knowledge of effective online product presentation, especially for apparel has been largely limited. While anecdotal evidence appears to have guided online retailers to adopt a variety of visualization techniques available, little empirical research has been conducted to support the effectiveness of those techniques. Therefore there is a critical need for more empirical research to enhance the existing knowledge of online product presentation. This will subsequently provide useful information for online retailers to develop more effective online product presentation that better satisfies the needs of online shoppers.

On a retail website, apparel is often presented with product pictures and verbal product descriptions. Some large online retailers have adopted diverse rich media to

facilitate virtual product evaluations, using large images, zoom and pan, 3D images, virtual models and, alternative views. Yet many apparel websites still lack an ability to facilitate a sensory product experience (Park, Lennon, & Stoel, 2005).

As a viable way to facilitate virtual product evaluations in online shopping, the concept of mental imagery may be a key to successful sensory evaluation of products in a virtual setting. Online product presentation using visual and verbal information can be used to evoke mental imagery that assists sensory experience of apparel shopping. Mental imagery involves perceptual information processing in which information is represented in an individual's working memory using daydreams, fantasies, and imagination. Mental imagery is especially critical when consumers are engaged in intangible or experiential purchases because mental imagery of a product is a major source of information for them to make judgments (Schwarz, 1986). In this regard, mental imagery can also be a primary source of information on apparel websites because the nature of online shopping for apparel is intangible and experiential.

The effectiveness of imagery-evoking strategies in influencing consumer behaviors has received much scholarly attention in advertising and tourism research. According to advertising research, imagery-evoking strategies are effective in creating positive attitudes towards advertising and the brand and behavioral intention (Babin & Burns, 1997; Miller & Stoica, 2003). Similarly, tourism research has found that imagery-evoking visual and verbal presentation on websites also increases positive attitudes and behavioral intentions (D'Argembeau & Linden, 2006). For the tourism industry, vivid pictures of travel destinations on travel websites have often been used to encourage

consumers to imagine them being at and enjoying their travel destination. Furthermore, concrete, verbal descriptions have been used to help consumers create mental representations of the destination (Walters, Sparks, & Herington, 2007).

In an attempt to explore an effective presentation strategy facilitating virtual product evaluations, this study posits that similar strategies evoking mental imagery as supported in advertising and tourism research might be applied to facilitate consumers' sensory experience in online apparel shopping. As in advertising and tourism research, successful mental imagery experiences can lead to positive consumer shopping outcomes. Therefore, the purposes of the proposed study are to examine the way by which online product presentations evoke mental imagery, and how mental imagery evoked by product presentation affects consumer's affective, cognitive, and conative responses. The findings of the proposed research are expected to extend the current knowledge in advertising and tourism to online shopping and thus add to the current literature on online consumer behaviors. Additionally, the findings are expected to provide practical implications for online retailers to address the needs of online shoppers.

LITERATURE REVIEW

Online Product Presentation

Researchers suggest that websites are similar to traditional advertisements in conceptual, physical, and functional aspects (Singh, & Dalal, 1999). An advertisement is a "paid form of nonpersonal presentation of ideas, goods or services, by an identified sponsor, with predominant use made of the media of mass communication" (Engel, Washaw, & Kinnear, 1979, p. 3). Similarly, a retail website is paid for by a company or institution, is impersonal, promotes ideas, goods, or services, and is a mass medium with a large audience (Singh & Dalal, 1999).

Singh and Dalal (1999) compared a website with an advertisement in two functional ways. According to a communication model, a website and an advertisement convey communication messages, and these messages are designed to inform and persuade consumers. To inform is to make consumers aware of and to create beliefs about the company or product. In a traditional advertising context, when a brand (e.g., Gap) of a product (e.g., a dress) exists and consumers are exposed to the message (e.g., design of the dress), this advertisement is informational and emotional in that the advertisement informs about the product or brand, and appeals to consumers' emotions. Websites are similar to a traditional advertisement because the site also provides information about the dress and appeals to the consumers' emotions, as if to say "Hey, this website is cool."

Persuasion, another function of an advertisement, produces positive attitudes toward a brand and also creates favorable behaviors toward the company. After learning information about the product, consumers may form positive impressions of an advertisement, positive attitudes toward the brand advertised, and positive attitudes toward the company producing the product. These attitudes affect consumers' purchasing of the advertised brand, consumers' loyalty, and consumers' feedback to the company. Similarly, in an online context, consumers may form positive impressions about a website, and develop positive attitudes toward the product being presented on the website and the company producing the product. Moreover, these favorable attitudes may influence behaviors such as revisiting a website, buying a product, sending email feedback to a web master, and adding the website to favorites. In addition to the conceptual, physical, and functional aspects of a website, methods to present a product are similar to print advertising in that a product is often presented in a combination of visual and verbal forms, which become a key source affecting consumer decision making in online shopping (Kim & Lennon, 2008).

Product presentation has been defined as "a consciously designed presentation of selected merchandise in a defined area (e.g., storefront window or end of aisle), highlighting the product(s) and creating a mood and/or message with the intent to positively affect consumers' approach responses" (Fiore, Yah, & Yoh, 2000, p. 29). On an online product page, a product picture and verbal product description are most common as basic forms of online product presentation (Kim & Lennon, 2008).

Visual product presentation is an important component of online visual merchandising. Visual merchandising, promoting visible elements by presentation, has been much emphasized in traditional retail stores (McGoldrick, 1990). Visual merchandising plays an important role in obtaining consumers' attention, helping them evaluate products, and finally affecting their purchasing behaviors (Sen, Block, & Chandran, 2002). Applied to an online retailing context, Ha, Kwon, and Lennon (2007) classified online visual merchandising cues into three categories: 1) product presentation method which includes a manner of color presentation, detailed view, and type of product view (e.g., front, side, and back view), 2) online path finding assistance, such as site map and merchandise categorization, and 3) online environment including introduction page and background color. Researchers have shown that product presentation is critical for apparel shopping in an online context because consumers rely more on visual product information for apparel products than for other product categories, such as books (Ha et al., 2007; Kim, Kim, & Lennon, 2007).

Along with the rapid growth of online apparel shopping, an increasing number of researchers have focused on the effects of various visual product presentation methods on consumer behaviors. For example, the use of color, graphics, layout and quality of pictures can stimulate consumers' intention to purchase on the Internet (Mathwick, Malhotra, & Rigdon, 2001). Then and Delong (1999) proposed three important visual aspects for product presentation on the Internet: "images of the on-line product in its closest representation of end use, displayed in conjunction with similar items, and from various angles such as front and back" (p. 67). Similarly, Khakimdjanova and Park

(2005) stated that presenting better visual displays, which may serve as a substitute for physical sensory experience, is one way to reduce perceived risk.

In addition to a picture of a product as a source of visual information, information of apparel products can be presented in a verbal form. In a traditional retail store, consumers seek labels and hangtags (Engel, Blackwell, & Miniard, 1986) which offers garment information such as price, fiber content, and care instructions. In a home shopping environment where consumers cannot directly look at the labels or hangtags, consumers are given such information in other ways. In television shopping, the TV shopping hosts in the programs often present such information verbally or have such information on the screen for viewers (Kim & Lennon, 2000). In online shopping, verbal product descriptions such as design features, construction details, fiber content, care instruction, color, size, and price are provided in a verbal form on most apparel websites. According to Eroglu et al. (2001), product information about size and colors, price, and product pictures are high-task relevant information available at online stores, which affects consumers' shopping behaviors.

Mental Imagery

Mental imagery refers to "a mental event involving visualization of a concept or relationship" (Lutz & Lutz, 1978, p. 611). It reflects the process by which sensory or perceptual information is represented in working memory (MacInnis & Price, 1987, p. 473). Mental imagery may be similar to perception in some ways, but it can be

distinguished from perception. For example, perception does not stimulate concrete representation of emotions or ideas of the individuals' memory, whereas mental imagery is a representation in working memory, thus creating emotions related to the memory (MacInnis & Price, 1987). In other words, imagery helps individuals draw information from long-term memory into working memory through high elaboration.

Imagery is a multidimensional construct including the dimensions of quantity, vividness, affective tone, and sensory modality (Miller & Stoica, 2003). Quantity has been defined as the number of images evoked by a stimulus. Thus, it refers to the number of activated working memory nodes containing perceptual or sensory information (Kieras, 1978). Related to overall quality of activated memory, vividness indicates the quality of mental imagery, including clarity, intensity, and distinctiveness (MacInnis & Price, 1987). Affective tone refers to the ways people understand emotional meaning regarding the memory. It may be positive or negative (Bower, 1981; Tondo & Cautela, 1974). Sensory modality indicates the sensory nature of imagery, including visual, auditory, tactile, olfactory and gustatory. Some of sensory stimuli are combined and processed together (e.g., combinations of visual and auditory modalities) whereas other sensory stimuli can be processed alone (e.g., visual modality). Previous research has found that visual imagery followed by auditory imagery is most dominant for most people (White, Sheehan, & Ashton, 1977).

Advertising researchers have found that stimuli (e.g., advertising messages) affect cognitive and affective responses, including consumers' positive emotions, favorable attitudes, decision making processes, and behavioral intentions, and consumers'

mental imagery evoked by the advertising stimuli mediate the relationship between stimuli and the cognitive and affective responses (Babin & Burns, 1997; Bone & Allen, 1990, 1992; Burns, Biswas & Babin, 1993; Mitchell, 1986). In addition, Schwarz (1986) posited that consumers' mental image of a product can be a key source of information, which helps to make a judgment. Horowitz (1972) noted that people evaluate a product using their mental representation or imagination of their consumption experience when the product is not present in the direct physical environment. Burns et al. (1993) provided a framework for the effects of mental imagery on advertising communications (See Figure 3.1). In this model, mental imagery mediated the relationship between vivid information and communication effects. Also, the researchers proposed that an individual's style of information processing moderates a relationship between advertising stimuli and mental imagery and a relationship between mental imagery and advertising effects. However, the results only showed the moderating effect on the relationship between advertising stimuli and mental imagery.

Prior advertising research has investigated various forms of external stimuli with regard to their effectiveness in evoking mental imagery. The most common way to evoke mental imagery in advertising was to include vivid visual and verbal information. According to Taylor and Thompson (1982), vivid visual and verbal information in advertising can draw consumers' attentions, influence consumers to elaborate mental imagery and to form positive attitudes toward the advertising, and consequently enhance behavioral intentions. Vivid information refers to sensitively interesting, concrete, and mental imagery evoking information which attracts consumers' attention and stimulates

their imagination (Nisbett & Ross, 1980). Pictures are used frequently to provide consumers with vivid information. Research findings have shown that more concrete pictures stimulated more vivid mental imagery than less concrete pictures (Babin & Burns, 1997) and concreteness in picture of attractive scenes in tourism advertising elicits mental imagery related to the resort (Miller & Stoica, 2003). Babin and Burns (1997) experimented with the use of instructions given to subjects to imagine through the use of verbal stimuli and found that these instructions to imagine affected elaboration and vividness of mental imagery, which in turn affected attitudes towards the advertising and the brand. Sound effects in radio commercials were also found to enhance quantity and vividness of imagery, thus improving recall of the message and emotions (Miller & Marks, 1992).

Much advertising research has supported the effects of mental imagery in that mental imagery evoked by advertising messages affected consumers' attitudes and behavioral intentions. Considering the fact that a website is very similar to traditional advertising in terms of presenting information in both verbal and visual forms, similar effects of mental imagery may occur in online environments. Furthermore, online product presentation can be developed to evoke mental imagery by using vivid visual and verbal information on a website. For example, product images (e.g., summer t-shirts) on vivid background pictures (e.g., beach) or vivid product descriptions (e.g., perfect on a hot and sunny beach) will activate viewers' mental imagery, which consequently may generate positive consumer responses.

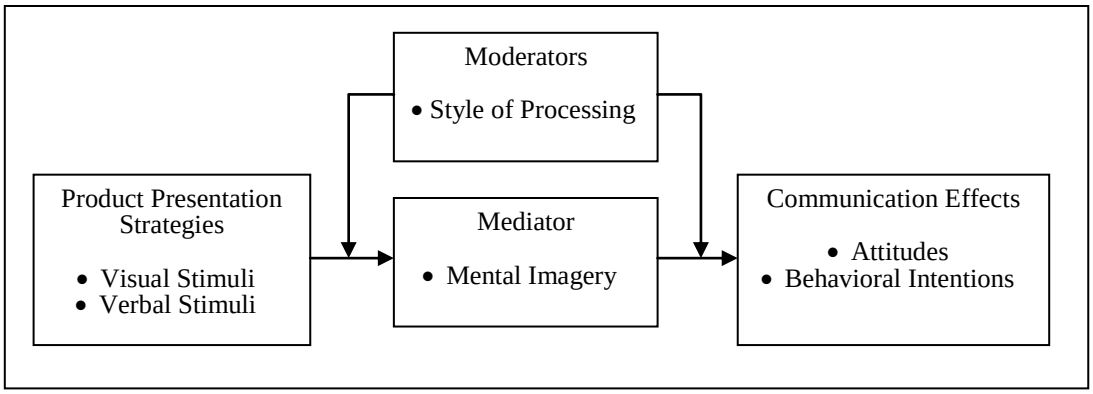

Figure 3.1. Theoretical framework for imagery-evoking product presentation on apparel websites (Burns et al., 1993)

Dual Coding Theory

Dual coding theory (Paivio, 2007) explains that an individual's cognition involves joint activity of two independent but interconnected systems: a nonverbal system and a verbal system. The nonverbal system deals with objects and events whereas the verbal system deals directly with language. Based on these two coding systems, nonverbal and verbal information can be encoded. For example, nonverbal information, such as a picture is encoded through the nonverbal system, while text is encoded through the verbal system. However, since these two systems are interconnected, each system activates the other system. In other words, nonverbal information also stimulates the verbal system just as verbal information stimulates the nonverbal system. When one encounters the text, "a sunny beach", the nonverbal system is also activated and the image of "a sunny beach" can be represented in one's mind. According to the dual coding theory, verbal information is processed sequentially and encoded verbally, whereas visual information

is processed simultaneously, thus being encoded as both image and text. Therefore, nonverbal information is encoded faster than verbal information. Even though concrete verbal information elicits images in one's mind, dual coding theory explains that verbal information processing through the nonverbal system is indirect compared to visual information processing through the verbal system.

In an online context, product images and product descriptions represent the types of available information. Product images can be encoded through nonverbal system and product descriptions can be encoded through the verbal system. However, product images activate the verbal system and product descriptions activate the nonverbal system at the same time. Based on the dual coding theory, it is assumed that both visual and verbal information can create mental imagery in consumers' minds, which in turn affect their attitudes and other behavioral intentions.

Hypothesis Development

Visual Information on a Website

Pictorial material refers to "any two dimensional representation in which the stimulus array contains at least one element that is not alphabetic, numeric, or arithmetic" (Lutz & Lutz, 1978, p. 611) and includes photographs, drawings, and illustrations (Babin, Burns, & Biswas, 1992). Horowitz (1972) noted that visual image is key information when consumers represent themselves and object relationships in a real world through mental imagery. Therefore, even if a product is not available in the physical environment,

consumers evaluate the product by representing both the product and themselves or consumption experiences in their mind.

Tourism research has shown that visual information is an important factor influencing consumers' choices in tourism. Consumers can conjure up a vacation experience by combining various types of pictures and their prior experiences. (Olson, McAlexander, & Roberts, 1986). Miller and Stocia (2003) also argued that mental representation using destination pictures in advertisements can be very effective and provide vivid information which draws attention and encourages imagination via concrete mental imagery. For example, when consumers planning a vacation have limited information about their travel destinations, concrete pictures of travel destinations can help them picture themselves being in the travel destination, which can facilitate their decision-making. The results from Miller and Stocia (2003) showed that concrete pictures influenced mental imagery, and the enhanced mental imagery influenced positive attitudes toward the advertising/brand, and intention to visit the website advertised.

Other advertising research has also found that visual stimuli affect people's information processing of mental imagery (Paivio, 2007; Rossiter, 1982). According to Babin and Burns (1997), compared to abstract pictures, concrete pictures led to more vivid imagery and more favorable attitudes toward the brand. The researchers used a photograph of a car negotiating a curve in the road as a concrete picture versus a photograph of a car focusing on close-up parts of the car in a three different panels that was not identified as a car by a focus group. In other words, people consider the single and entire image of the product as more vivid than the separate close-up shots of the

product. The results showed that concrete visual stimuli affected vividness of imagery and attitude toward the brand, but there are no effects on quantity of imagery and elaboration of imagery.

The effects of mental imagery evoked by visual images on consumer behavior were tested in an online context. For example, Kiss and Esch (2006) conducted an online experiment using soft drinks product. The researchers created mock website homepages with concrete pictures versus unrealistic and cartoon-like pictures and found that concrete pictures positively affected participants' mental imagery, attitude toward the website, and attitude toward the brand. Kim and Lennon (2008) found that visual information affected both affective and cognitive attitudes in online apparel shopping. The researchers manipulated size of visual information. When people are exposed to large images conveying more visual information, they expressed more positive attitude toward the product. In addition, they perceived more information.

In the proposed study, concrete visual information was operationalized as a product image on online apparel website with a concrete and relevant background image evoking mental imagery. According to Rossiter (1982), concrete stimuli refer to "objects, persons, places, or things that can be seen, heard, felt, smelt, or tasted (p. 101)," whereas abstract stimuli refer to "stimuli that cannot be experienced by the senses (p. 101)." Therefore, if an apparel product is presented with a concrete background reflecting the place where one may wear the apparel item (e.g., summer clothes on a vacation background), then the product presentation may be effective in evoking more concrete and vivid imagery than the one without such a background. For example, if a model is

wearing summer clothes at a beach on an apparel website, it may be easier for consumers to picture themselves wearing the clothes on the beach. Thus, based on previous research, the following hypotheses were developed.

H1: As compared to people exposed to a product image with a solid background, those exposed to a product image with a concrete background will experience greater mental imagery.

Verbal Information on a Website

Verbal information can also elicit mental imagery. According to Paivio, Yuille, and Madigan (1968), concrete words make it easier for users to form mental imagery than do abstract words. For example, compared to abstract words, such as "hope," people create a mental image of "chair" more easily, and concrete words were found to be more effective on memory than abstract words (Paivio, 1969). Other studies also provide support that concrete words have significant impact on memory and attitudes (Lutz & Lutz, 1978; Rossiter & Percy, 1978).

Some words can elicit images in mind of readers, viewers, or listeners (Unnava, Agarwal, & Haugtvedt, 1996; Unnava & Burnkrant, 1991). Rossiter (1982) argued that such words evoking high imagery are required in advertising. According to Mitchell and Olson (1981), just as with visual stimuli, verbal stimuli also affect consumers' information processing through mental imagery. Burns et al. (1993) showed evidence that there is a positive relationship between concreteness of the advertisement copy, vividness of imagery, attitudes toward the brand and behavioral intention. Another study found that

instructions to imagine using a verbal copy influenced mental imagery and favorable attitudinal judgments (Babin & Burns, 1997). Furthermore, another study found that the vividness of the verbal script positively affected quantity and vividness of imagery, and attitudes toward the advertising (Miller & Marks, 1997).

Fiore and Yu (2001) provided examples of high imagery words and low imagery words in a catalog shopping context. High imagery words were verbal information which describes features and a consumption situation for the product, thus facilitating the creation of images in one's mind. On the other hand, low imagery words were factual product information, such as price, color and size. In an online context, the amount of verbal information influenced positive attitude toward the product, and perceived amount of information. Compared to people exposed to less verbal information, people exposed to more verbal information perceived more amount of information (Kim & Lennon, 2008). While it was not directly tested in their study, Kim and Lennon speculated that the concrete verbal product descriptions in a high information condition may have contributed to more imagery information processing than the low information condition.

In the proposed study, concrete verbal information was operationalized as written product information evoking mental representation. Walters et al. (2007) examined the effects of concrete words on print advertising on imagery. The researchers selected a beach to be advertised and manipulated concrete words such as "a palm fringed beach" and "relaxing sun lounges", which were found to affect mental representation in the participants' minds. Similarly, if summer t-shirts and pants are presented on an apparel website with concrete verbal information (e.g., perfect in a palm fringed beach), then

consumers may create the image in their mind more easily, such as how the t-shirts will be worn best. Accordingly, the following hypotheses were developed.

> **H2**: As compared to people exposed to less concrete verbal information, those exposed to more concrete verbal information will experience greater mental imagery.

Mental imagery processing uses visual, somatic, and verbal information, by which people imagine behavioral situations (Goossens, 1994). Based on dual-coding theory (Pavio, 2007), Goossens developed the mental imagery processing model, which posits that imagery processing involves an interaction between the visual system and the verbal system. For example, "hot sun, hot music, and hot bodies – it must be south beach" can be a high-imagery phrase in a radio advertisement. This advertisement activates listeners' verbal system as well as visual system, which elicits mental images of the beach based on the listeners' long-term memories. In other words, a high-imagery radio advertisement activates both verbal and visual processing systems, but the visual system is superior to the verbal system.

The effects of concrete words and visual images on mental imagery were found to be significant. Babin and Burns (1997) noted that concrete words might be more useful than concrete pictures alone to form mental imagery and to persuade consumers. Walters et al. (2007) also examined combinations of visual and verbal information which elicit mental imagery in a tourism context. The researchers manipulated three levels of visual information (i.e., concrete pictures, less concrete pictures, and no picture) and three levels

of verbal information (i.e., concrete imagery-evoking words, instructions to imagine, and a combination of concrete imagery-evoking words and instructions to imagine) in print advertisements. Concrete pictures showed sky, sand, water, palm tree, and deck chairs in an entire island-type scene whereas less concrete pictures only contained deck chairs in a plain blue backdrop background. In addition, "palm fringed beaches" and "relaxing sun lounges" were used as concrete words evoking mental imagery and the third condition including instructions to imagine showed destination descriptions and asked the participants to imagine themselves in the place. The researchers measured consumption vision as a dependent variable which is considered to measure mental imagery of future consumption situations, but Gartner (1993) noted that it is the same concept as mental imagery. Multivariate analyses revealed an interaction effect of pictures and words on the consumption vision, and post hoc tests showed that combinations of a concrete picture and verbal content including instructions to imagine were the most effective in eliciting consumption vision among tourism consumers. Therefore, the following hypothesis was developed.

H3: A product image with a concrete background and concrete verbal information will interact to affect mental imagery.

The Moderating Effect of Style of Processing

Studies have revealed that individuals' information acquisition and utilization are significantly different when they make judgments. For example, depending on individual

characteristics and cognitive styles, people use more or less verbal or visual information in the process of cognition, leading them to be mainly either verbalizers or visualizers (Richardson, 1994). According to Rossiter and Percy (1978), the effects of image-oriented print advertisements on consumer reactions differs based on individual's preference for the type of imaginal processing. Visualizers are image-oriented consumers, who like to be shown while verbalizers are text-oriented consumers, who prefer to read. Also, visualizers are more likely to enjoy visual games than verbalizers (Mendelson & Thorson, 2004). Childers, Houston, & Heckler (1985) noted that individuals' information processing styles determine whether they focus more on either visual or verbal processing, and using this insight, developed their style of information processing (SOP) scale. Based on the scale, Burns et al. (1993) tested the moderating effects of individual styles of information processing on imagery and attitude toward the brand. The results revealed that SOP moderated the effects of instructions to imagine on brand attitudes. Visualizers showed more positive brand attitudes than verbalized people when they received instructions to imagine. Also, verbalizers had lower scores on the brand attitudes than visualized people when both instruction to imagine and no instruction to imagine were given.

H4: The style of information processing will moderate the relationship between product presentation and mental imagery.

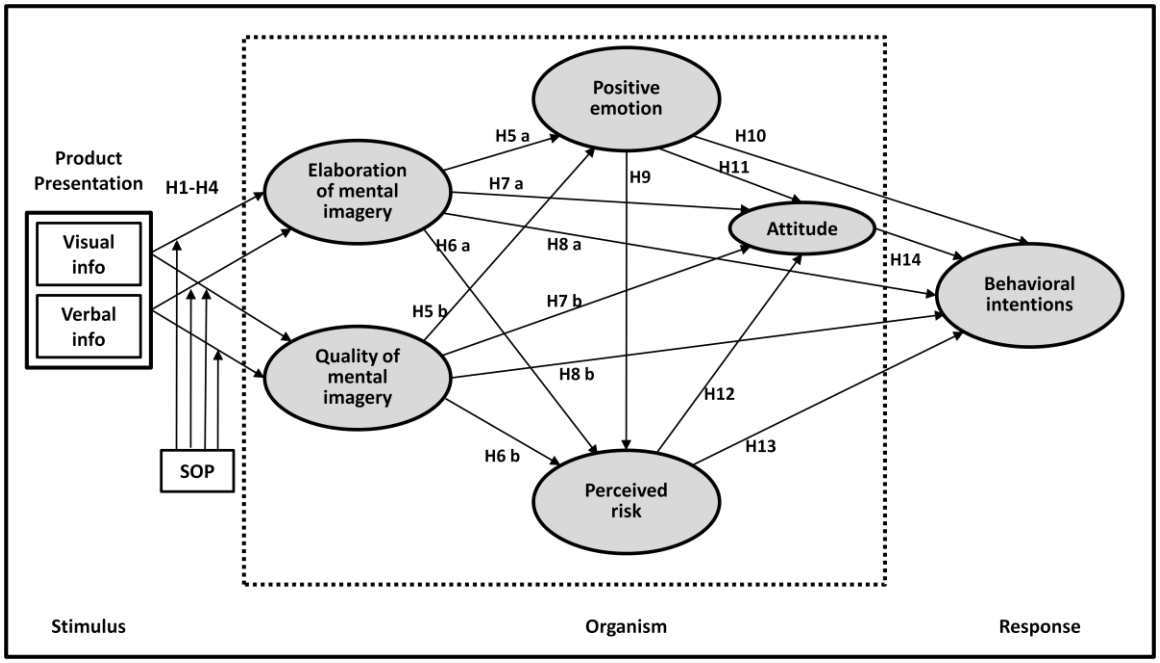

Figure 3.2. Hypotheses

The Effects of Mental Imagery on Consumer Responses

Positive Emotion

According to Propositional-Representations theory (Kieras, 1978; Lang, 1979), conscious thinking generates the activation of propositional structures, and mental representation of content, structure, and processes of long-term memory is performed by propositional networks connected by a number of links. Thus, if propositional structures related to perceptual knowledge are activated, imagery occurs. Based on this theory, Bower (1981) noted that memory of personal experience engenders emotions because propositional structures are connected to specific emotional nodes, such as anger, sadness, and joy. Lang (1979) also found that personal memories are emotional

experiences. When personal memory is activated and represented in one's mind, emotions related to the memory can be generated. However, the degree of emotional responses differs based on the intensity of emotional nodes activated. In other words, the degree of mental imagery (e.g., vividness) can determine the strength of the emotions. Rossiter and Percy (1978) also found that visual imagery affects emotional responses to visual advertisements.

Dual coding theory also explains emotions evoked by visual and verbal information. According to Paivio (2007), individuals' emotional reactions are caused mainly by visual information, which is connected to visual mental representations. Schwartz, Weinberger, and Singer (1981) supported the relationship between mental imagery and emotions. The researchers argued that the mental representation of a situation makes people emotionally aroused as if they were experiencing the situation in reality. However, verbal information also arouses emotions by activating visual representation of emotional events. For example, when people read a horror story, the story activates mental imagery related to the story. Paivio's (1978) empirical test revealed that visual and verbal information affected emotions, but pictures were superior to concrete words.

Researchers in a clinical domain have studied the effects of mental imagery on emotional changes. Holmes and Mathews (2005) studied the effects on emotion of mental imagery related to an unpleasant event and found that the mental imagery significantly influenced anxiety. In other words, when people represent any negative situation in their minds, then the mental representation affects their anxiety and mood disorders. However,

Holmes, Mathews, and Dalgleish (2006) suggested that mental imagery may affect other emotions, such as positive emotions based on the assumption that all events can be interpreted in a negative, benign, or positive way. Holmes et al. manipulated descriptions of a positive event and asked participants to imagine in one condition and to think about their verbal meaning in the other condition. The results showed that participants in an imagery condition expressed increased positive emotion as well as a decreased level of anxiety, supporting the effect of mental imagery on positive emotion.

This study uses concrete background images and concrete verbal information on an apparel website. Summer t-shirts and pants are presented on a vacation scene with verbal descriptions of a beach. Based on the previous research, if consumers shop this website, their mental imagery through the vacation scene on a beach may elicit positive emotions while they shop online. Therefore, the following hypothesis was developed.

H5: Mental imagery will be positively associated with positive emotion.

Perceived Risk

Perceived risk was defined as "the nature and amount of risk perceived by a consumer in contemplating a particular purchase decision" (Cox & Rich, 1964, p.33). Perceived risk is considered different depending on the type of merchandise and shopping situation. As a type of merchandise, apparel has been associated with higher levels of risk than other merchandise (Kapferer & Laurent, 1985; Kwon, Paek, & Arzeni, 1991; McCorkle, 1990). Since apparel is sensitive to fashion trends, consumers tend to perceive

more risk in purchasing apparel products than other products (Kwon et al., 1991). In addition, perceived risk is often associated with nonstore retailers, such as telephone shopping (Cox & Rich, 1964), catalog shopping (Kwon et al., 1991), television shopping (Kim & Lennon, 2000), and online shopping (Yoo & Lennon, 2006) because consumers feel more uncertain due to an inability to examine the product and to interact with the salesperson.

Product presentation has been found to affect consumers' perceived risk (Park et al., 2005; Then & Delong, 1999; Yoo & Lennon, 2006). According to Park and Stoel (2002), visual aspects such as product pictures are crucial elements for garment selection in online stores. Khakimdjanova and Park (2005) also stated that presenting better visual displays, which may serve as a substitute for physical sensory experience, is one way to reduce perceived risk. For example, Slyke, Comunale, and Belanger (2002) emphasized that high quality visual images on websites can increase perceived trustworthiness of the product and the websites and finally reduce perceived risk. In addition to visual images, verbal product descriptions influence perceived risk. Kwon et al. (1991) noted that verbal information, such as product descriptions, reduced perceived risk.

According to literature, mental imagery is a strong predictor of risk perception (Leiserowitz, 2006). For example, recent research examined effects of warning messages using text and images on risk perceptions. In the experiment, smokers were exposed to either text warning messages or image messages (McCaul, Mullens, Romanek, Erickson, & Gatheridge, 2007). The results showed that smokers who experienced mental

representation of bad consequences of smoking from image messages perceived a higher degree of risk to their health than those exposed to text messages.

In nonstore retailing, visual and verbal product presentation evoking mental imagery is a possible way to compensate for the disadvantage of online shopping in terms of physical examination of a product and to help consumers reduce their perceived risk. In other words, mental imagery makes it easier for consumers to experience physical inspection of the product and consumption situations through imagination. For example, an empirical study showed that visual and verbal information for product textures helps consumers gain more haptic information (Peck & Childers, 2003). Similarly, when people shop online, they may imagine the product (mental imagery) presented on the website. At that time, when people imagine the situations where the product is used by themselves, those images in their mind are elaborated. When product images or verbal information are concrete (e.g., summer t-shirts and pants presented at a beach, or the t-shirts and pants with the situational description), mental images of the product and the product usage are more precise and clearer (MacInnis & Price, 1987), which in turn may help consumers perceive less risk about the product and the product usage. Therefore, it is reasonable to posit that consumers may perceive less risk when they process visual and verbal information on the apparel website through mental imagery.

H6: Mental imagery will be negatively associated with perceived risk.

Attitude toward a Website

Attitude was defined as "a person's evaluation of any psychological object (Ajzen & Fishbein, 1980, p. 27)" and "the categorization of a stimulus object along an evaluative dimension (Zanna & Rempel, 1998, p. 319) and has been used to predict diverse consumer behaviors. In imagery research, Babin and Burns (1997) provided empirical evidence that mental imagery influenced attitudinal judgments. Mental imagery processing can thus be seen as a strong mediator in how imagery-evoking advertising strategies affect consumer attitudes toward advertising. The effect of vividness of mental imagery on attitude was found in radio advertising (Bone & Ellen, 1992; Miller & Mark, 1997) and print advertisement (Burns et al., 1993).

Attitude towards advertising has been widely used to examine the effects of mental imagery on advertising outcomes. Several recent studies have adopted and modified the measure of attitudes toward advertising to investigate effects of website features and message strategy on attitudes toward websites (Brackett & Carr, 2001; McMillan, Hwang, & Lee, 2003). McMillan et al. (2003) found that website features affected positive attitude towards the website. Similarly, this study investigates the effects of mental imagery on attitude toward a website. By facilitating consumers' mental imagery of their consumption, the product presentation with relevant background and concrete verbal information are predicted to positively influence a consumer's attitudes towards a website. Therefore the following hypothesis was developed.

H7: Mental imagery will be positively associated with attitude toward a website.

Behavioral Intentions

Behavioral intentions refer to "what the person intends to do" in a specific area of behaviors (O'Keefe, 2002, p. 101). According to Zeithaml, Berry, and Parasuraman (1996), consumers' behavioral intentions are either favorable or unfavorable. Favorable behavioral intentions include positive word-of-mouth, willingness to pay extra money, and increase of business volume with the retailer, whereas unfavorable behavioral intentions include negative word-of-mouth, brand switching, unwillingness to pay extra money, and decrease of business volume with the retailer.

Donovan and Rossiter (1982) noted that consumers' internal states (e.g., mental imagery, emotions, perceived risk, and attitudes) influence their behavioral intentions (SOR model). In addition, Bagozzi (1982) studied causal relationships among cognitions, affect, behavioral intentions, and behaviors. This research found that behavioral intentions were a perfect mediator in a relationship between affective and cognitive states and actual behaviors. In other words, consumers' actual behaviors were directly influenced only by their behavioral intentions.

One of the effective consequences of mental imagery is behavioral intentions. Miller and Stoica (2003) in Tourism conducted an experiment using a photograph of a beach scene to examine the effect of the pictures on mental imagery and behavioral intentions. The results showed that the mental imagery evoked by the concrete picture was significantly related to consumers' intentions to visit the website. Also, Burns et al. (1993) found a positive relationship between mental imagery and behavioral intentions. Consumers who experienced higher mental imagery from concrete words had stronger

behavioral intentions than those who experienced lower mental imagery. Therefore, based on previous research, the following hypothesis was developed.

H8: Mental imagery will be positively associated with behavioral intentions.

Relationship between Positive Emotion and Perceived Risk

Many theories of risk perceptions focused on cognitive activities as antecedents of perceived risk (Loewenstein, Weber, Hsee, & Welch, 2001). Therefore, prior research assumed that people evaluate stimuli analytically and then make a decision about desirable outcomes. However, Zajonc (1980) critiqued those theories of cognitive paradigm and emphasized the importance of affective reactions in a decision making process. According to the researcher, affective and emotional reactions occur automatically before cognitive states and also influence analytical evaluation.

Imagery research has found that emotions evoked from mental representation are related to people's risk perceptions. According to a study of nuclear waste repositories, people who had negative emotions from images related to death or cancer perceived a high degree of risk about nuclear energy (Slovic, Layman, & Flynn, 1991). In addition, further research found that negative emotions elicited from mental representation of global warming influenced people's risk perception about global warming (Leiserowitz, 2006).

Chaudhuri (2002) studied the relationship between emotion and perceived risk on the consumption of products and services. According to the researcher, perceived risk is

evoked from lack of knowledge about a product, and knowledge comes partly from emotion and partly from product information. Buck (1988) defined emotion as knowledge by acquaintance, which means "immediate and direct subjective experience" about the product and service during the consumption experience (Chaudhuri, 2002, p. 268). The researcher found that the emotions are strongly related to perceived risk for product and services. Negative emotions were a stronger determinant of perceived risk than positive emotions whereas positive emotions reduced perceived risk and even decreased perceived risk when products were thought to be more expensive than average. The researcher argued that to a large extent emotion accounted for unique variance in perceived risk.

In an online context, Park et al. (2005) investigated effects of product presentation on mood and perceived risk. The research was consistent with previous research, finding a negative relationship between positive moods and perceived risk. Also, the researchers claimed that creating positive emotion is important for online retailers since it may help consumers perceive less risk. Yoo and Lennon (2006) also supported the negative relationship between positive emotions and perceived risk in apparel online shopping. Based on the literature, it is reasonable to posit that evoking positive emotions in an apparel website might be an important means of reducing consumers' perceived risk.

H9: Positive emotion will be negatively associated with perceived risk.

Relationship between Positive Emotion and Attitude toward a Website

Social psychologists have found that people's emotional states influence their attitude toward people (Bodenhausen, Mussweiler, Gabriel, & Moreno, 2001). For example, anger or happiness makes people use heuristics when they process social information, which in turn affects their attitudes (Tiedens & Linton, 2001). In a marketing area, Lee and Thorson (2009) studied how an advertising banner on affective or cognitive websites affects attitudes and purchase intention. The researchers manipulated two websites: affective websites and cognitive websites. In order to select affective websites, the researchers used a scale including "this website is emotional," "this website made me feel," and "this website was mainly concerned with entertainment and arousing." In other words, the researchers hypothesized that if consumers have emotion on the website, they may have positive attitude toward the advertising or brand. As a result, participants who were exposed to the affective website expressed a positive attitude toward the brand and higher purchase intention. Burke and Edell (1989) showed that emotions created by emotional appeals influenced consumers' attitudes toward the brand and advertisements. Therefore, the following hypothesis was developed.

H10: Positive emotion will be positively associated with attitude toward a website.

Relationships between Positive Emotion and Behavioral Intentions

In general, emotional states have been considered as a significant aspect influencing consumers' persuasive value (Geuens & De Pelsmacker, 1998). According to previous literature, positive emotion leads to more favorable responses to stimuli, which in turn activates positive behavioral responses, such as purchasing the product. On the other hand, negative emotion leads to less favorable responses to stimuli, which decreases behavioral intentions (Andrade, 2005).

Environmental psychology also provides empirical supports for the relationship between emotions and behavioral intention (Donovan & Rossiter, 1982). The researchers found that pleasure was an important determinant of behavioral intentions and spending behavior. Arousal also increased intent to spend time in the store. Similarly, Eroglu, Machleit, & Davis (2003) found that consumers showed favorable attitudes and shopping behaviors at pleasant and arousing websites. These findings are consistent with Huang's (2003) study in that consumers tended to shop more often at pleasant and arousing websites. Extended research by Donovan, Rossiter, Marcoolyn, and Nesdale (1994) examined the relationship between emotional states and actual purchase behavior, and concluded that pleasure evoked from store environments leads consumers to spend more time in the store and to spend more money than they intended.

Babin, Dardin, and Griffin (1994) claimed that positive emotions (e.g., good, happy, and satisfied) can increase time and money spent in the store and even create positive judgment about the store. Also, Park et al. (2005) found that positive emotions derived from an appealing visual display increased purchase intention in online shopping.

According to Chang and Cheung (2001), consumers' enjoyable, excited and pleasant emotions influenced higher intention to visit the websites compared to depressed, calm, unpleasant consumers. Thus, if consumers have positive emotions from imagery-evoking product presentation, then their behavioral intentions will increase.

H11: Positive emotion will be positively associated with behavioral intentions.

Relationship between Perceived Risk and Attitude toward a Website

In an online shopping context, as consumers trust the website, their perceived risk decreases. In addition, low perceived risk increases positive attitudes toward the website (Jarvenpaa, Tractinsky, & Vitale, 2000). The relationship was consistent with Heijden, Verhangen, and Creemers (2003)'s study. The researchers used two CD websites in a Dutch market: one was a newcomer and the other one was a well-known chain store. The research finding shows that perceived risk influenced negative attitudes toward online purchasing. Therefore, the following hypothesis was developed.

H12: Perceived risk will be negatively associated with attitude toward a website.

Relationships between Perceived Risk and Behavioral Intentions

Cox (1967) proposed that higher perceived risk influences consumers' purchase intention. Similarly, Cox and Rich (1964) noted that perceived risk is a main reason

influencing consumer behaviors in telephone shopping. A consistent result was found in television shopping (Kim & Lennon, 2000).

According to Howard (1973), there may be a negative relationship between consumers' perceived risk and their level of confidence when making a judgment about a brand. Perceived risk is similar to uncertainty that consumers feel toward their shopping outcomes and the uncertainty has the opposite meaning of confidence. Howard and Sheth (1969) discovered that the level of confidence affects purchase intention positively. In addition, Bennett and Harrell (1975) argued that consumers' confidence toward a brand positively influences their behavioral intention toward the brand.

People who shop online for apparel are more likely to perceive risk than people who shop in physical stores (Park & Stoel, 2002). In this regard, many researchers have examined the relationship between perceived risk and behavioral intentions. For example, Van den Poel & Leunis (1999) studied the relationship between perceived risk and intent to adopt online shopping, and Park et al. (2005) studied the effects of product presentation on perceived risk and purchase intention. The results were consistent in that low perceived risk increased consumers' behavioral intentions. Therefore, the following hypothesis was developed.

H13: Perceived risk will be negatively associated with behavioral intentions.

Relationships between Attitude toward a Website and Behavioral Intentions

Relationship between attitude and purchase intention can be explained by the theory of reasoned action (Ajzen & Fishbein, 1980). The theory explains people's intention to behave in a certain way, and their behavioral intention is determined by their attitudes. The Technology Acceptance Model (TAM) also explains the relationship between attitudes and behavioral intentions (Davis, 1986). The model hypothesizes that consumers' attitudes influence their behavioral intentions, which in turn are connected to actual behaviors. This relationship has been supported in much empirical research. For example, Shim and Drake (1990) investigated how different attitudes towards mail order shopping of apparel consumers influenced their degree of purchase intention. Positive attitudes toward mail order shopping for apparel led to high purchase intention. In an online context, Chen, Gillenson, and Sherrell (2002) also found that consumers' attitudes toward online shopping significantly influenced their behavioral intentions. This result is consistent with Heijden et al. (2003)'s finding. Therefore, if consumers have a positive attitude towards a website, then their behavioral intentions are likely to increase.

H14: Attitude toward a website will be positively associated with behavioral intentions.

METHOD

This study used an online experiment simulating online apparel shopping. According to Hantula (2005), the most stimulating aspect of an online experiment is to blur the distinction between an experimental situation and reality because online experiments are conducted on the same types of computers participants use. For this study, mock websites with a fictitious brand name were developed. The design of the study was a 2 (visual information: product image with a concrete background vs. product image with a solid white background) x 2 (verbal information: presence of concrete descriptions vs. absence of concrete descriptions) between-subjects factorial design. This section presents a description of methods and procedures used to develop stimuli and instruments and to collect data.

Pretests

Four pretests were conducted to select reliable website stimuli for the main experiment. A convenience sample of college women was recruited from the Department of Design and Human Environment at Oregon State University for each pretest. Extra credit was given in exchange for participation. Participants for the four pretests did not overlap.

Pretest 1

The first pretest was administered to select relevant background images of garments that successfully evoke mental imagery. Twelve product images with concrete backgrounds were selected from commercial websites. No brand logos or names were shown on these pictures. All twelve original pictures showed summer outfits with relevant concrete backgrounds (e.g., a t-shirt presented on a vacation scene, See Figure 3.3). To create solid white backgrounds from the same twelve images Adobe Photoshop was used. As a result, the same twelve product images were shown on the two different manipulation conditions (concrete background vs. solid white background) (See Appendix G).

Figure 3.3. Example of summer outfits with a relevant concrete background vs. a solid white background

In the Pretest 1, a total of seventy female students participated in the survey. Participants were randomly assigned to one of two treatment conditions and were asked

to view the twelve images for a stimulus sampling purpose and to indicate the degree of mental imagery elicited from each stimulus. Participants in the treatment condition 1 viewed product images with solid white backgrounds whereas participants in treatment condition 2 viewed product images with concrete backgrounds.

Mental imagery was measured on the same scale which was used in the main experiment (Walters et al., 2007) (See Appendix G). The scale included 13 items with end points from 1 (strongly disagree) to 7 (strongly agree) and were found to be reliable (α = .84 to .93). Since the Walters et al. scale focused more on mental imagery in consumption situations, the scale was deemed appropriate to be used in Pretest 1 to test product images. The scale was first analyzed using an exploratory factor analysis to identify dimensions of the measurement. Varimax rotation was employed to perform the factor analysis. As a result, two factors for all twelve items were identified, which was consistent with previous research (Walters et al., 2007). Based on Walters et al.'s study, the two factors in the mental imagery were named "elaboration (factor 1)" and "quality (factor 2)". Cronbach's *alpha* for each style ranged from .98 to .89 (See Appendix M, Table M.1).

Data from Pretest 1 were also analyzed using descriptive statistics and multivariate analysis of variance. Mean scores for each stimulus from the treatment condition 2 (product images with concrete backgrounds) were ranked from highest score to lowest score. To select imagery evoking product images with concrete backgrounds, the three highest scores, stimulus 3 (elaboration: M = 4.84, SD = .93; quality: M = 4.98, SD = 1.12), stimulus 7(elaboration: M = 5.22, SD = 1.26; quality: M = 5.38, SD = 1.26),

and stimulus 9 (elaboration: M = 5.05, SD = 1.21; quality: M = 5.10, SD = 1.35) were selected. Higher scores indicate that participants experienced greater elaboration (factor 1) and greater quality of mental imagery (factor 2) from the product images.

Results of MANOVAs and ANOVAs further revealed that the three stimuli from treatment conditions 1 and 2 were significantly different in terms of elaboration and quality in mental imagery (See Table 3.1). However, scores from the other 9 stimuli in treatment conditions 1 and 2 were marginally significant (p = .055). Descriptive statistics and the results of factor analysis can be seen in Appendix M (See Table M.2). Based on Pretest 1, stimuli 3, 7, and 9 were selected for the main experiment.

Table 3.1. Results of MANOVAs and ANOVAs for stimuli 3, 7, and 9

		Wilks' λ	*df*	*F*	*p*
Stimulus 3		.71	2, 67	13.41	.000***
	Elaboration		1,68	26.97	.000***
	Quality		1,68	9.30	.003**
Stimulus 7		.87	2, 67	4.91	.010*
	Elaboration		1,68	8.70	.004**
	Quality		1,68	8.15	.006**
Stimulus 9		.82	2, 67	7.40	.001**
	Elaboration		1,68	14.90	.000***
	Quality		1,68	3.81	.055

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

Pretest 2

This study used three outfits in mock websites. Pretest 2 was administered to investigate if the three garments selected were neutral in terms of fashionability (See Appendix H). Even though there were obvious differences in product presentation

between treatment conditions (e.g., concrete background vs. solid background), selecting garment styles that were neutral in terms of fashionability was important because consumers could be affected by the products' fashionability rather than the products' presentation. Thirty-four female students in Department of Design and Human Environment were asked to rate garment fashionability.

The 7-point adjective scale items had endpoints of "good, pleasant, likable, flattering, attractive, and stylish (7)" and "bad, unpleasant, not likable, unflattering, unattractive, and not stylish (1)." These adjectives were developed by Cox and Cox (2002) for garment style ratings and used in various studies. Reliability provided by Cox and Cox was .81. Scores from these six items were summed and averaged to be used as the overall score of fashionability.

Reliability of the scale which was used to measure garment fashionability of the selected stimuli was first analyzed, and Cronbach's *alphas* ranged from .96 to .98. Data were also analyzed using descriptive statistics. Mean scores for the three styles were around 4 points out of 7, which indicates that the garment styles from the selected stimuli in the Pretest 1 were fairly neutral in terms of fashionability (style in stimulus 3: [M = 4.82, SD = 1.39], style in stimulus 7: [M = 4.72, SD = 1.49], and style in stimulus 9: [M = 4.32, SD = 1.54]). Therefore, the selected stimuli were deem appropriate for the main experiment. The results of descriptive statistics, reliability, and factor analysis are presented in Appendix M (See Table M.3).

Pretest 3

The purpose of Pretest 3 was to select relevant concrete verbal descriptions depicting the consumption situations, which evoke mental imagery. Using six verbal descriptions selected from the website, one webpage was created for the pretest. Seventy-seven female students participated in Pretest 3 for extra credit. Once participants accessed the web page, they could view the verbal descriptions, and they were asked to rate the degree of mental imagery elicited from each description (See Appendix I).

Because Pretest 3 only presented verbal descriptions without product images to the participants to measure mental imagery, the scale focusing on consumption situations was not considered to be suitable. Thus, measuring mental imagery using a scale developed by Ellen and Bone (1991), tapping general mental imagery, was deemed more appropriate. This scale was adopted by Miller and Marks (1997) and found to be reliable (α = .87 to .92).

Items of mental imagery included eight 5-point items. The items included "to what extent did any images come to mind" (very small = 1 to very great = 5), "whether they experienced few or no images" (1) or "lots of images" (5), and "all sorts of pictures came to mind while reading the words" (strongly disagree = 1 to strongly agree = 5). Also, there were 5-point adjective items including "clear, vivid, intense, lifelike, and sharp (does not describe at all = 1 to describes perfectly = 5)."

The scale was first analyzed using a factor analysis to identify dimensions of the measurement. Maximum likelihood (ML) and varimax rotation were employed to perform the factor analysis. As a result, one factor was identified for all six verbal

descriptions, and Cronbach's *alphas* ranged from .94 to .98. Therefore, eight items were summed and averaged to be used an overall score of mental imagery.

Pretest 3 was analyzed using descriptive statistics, and mean scores for each description were ranked from highest score to lowest score. To select verbal descriptions evoking high levels of imagery, the three highest mean scores, description 3, (M = 4.50, SD = 1.56), description 5 (M = 4.55, SD = 1.50) and description 6 (M = 4.68, SD = 1.34) were selected. The three verbal descriptions chosen were "make waves in bright ocean hues, be a shining star on any vacation", "simply stunning for vacation at sugar white sand and sun-kissed skies", and "A tropical beauty with colorful finish, perfect for vacation in crystal clear waters". After being matched with the background images selected in Pretest 1, three verbal descriptions were combined to the relevant background images from Pretest 1. For example, "make waves in bright ocean hues, be a shining star on any vacation" was combined with a stimulus 9 picturing ocean waves. The results of Pretest 3 are summarized in Appendix M (See Table M.4).

Pretest 4

The last pretest was conducted to select appropriate scale items for emotion measurement. Although there are currently many scales used to measure emotional states (Izard, 1972; Mehrabian & Russell, 1974; Miller & Marks; 1997), some items are irrelevant in the context of this study. For example, Miller and Marks (1997) used a scale measuring emotions, whose items included joyous, cheerful, happy, inspired, stimulated,

delighted, energetic, active, and alive. However, when people view a beach scene including summer clothes, they may not have energetic emotions.

Shaver, Schwartz, Kirson, and O'Connor (1987) summarized all emotional words used in prior studies and selected a total of 213 emotion words. The researchers divided the emotional words into six categories, including love, joy, surprise, anger, sadness, and fear. Among the six categories, only the categories love and joy were considered in this pretest because this study measured only positive emotions derived from imagery evoking product presentation. Finally, among 49 emotional words from the love and joy categories, nineteen emotional words which were considered relevant to this study were selected by both the researcher and one native speaker.

Thirty-six female students from Department of Design and Human Environment participated in Pretest 4 in exchange for extra credit in their class. For the Pretest 4, one web page including product images with concrete backgrounds and verbal descriptions evoking mental imagery was created (See Appendix J). After viewing the stimuli, participants were asked to choose relevant emotional words evoked from the images. Also, they were asked to indicate other emotional words relevant to them which were not listed in the nineteen words in an open-ended format.

Based on descriptive statistic, ten emotional words that were most frequently used by the participants were selected for the main experiment. The selected emotional words included "amuse, pleasure, delighted, joyful, stimulated, contented, happy, hopeful, relaxed, and satisfied" (See Appendix M, Table M.5). Participants also provided additional emotional words in the open-ended question, such as "focused, beautiful, calm,

pleased, and comfortable". However, these emotional words were not included in the main experiment because the frequency of these words was very low.

Main Experiment

The design of this study was a 2 x 2 between-subjects factorial design. Independent variables were visual information (a product image with a concrete background vs. a product image with a solid white background) and verbal information (product descriptions with concrete words vs. product descriptions without concrete words). Also, SOP (visualizers vs. verbalizers) was measured as a moderator.

Stimulus Development

For mock research websites, an existing foreign website to which US college students have not been exposed was used as a template to avoid any potential effect of brand/store name bias as a result of website familiarity. Based on the results of pretests, four mock websites were developed. The four experimental conditions were: (1) product images with concrete backgrounds + product descriptions including concrete words evoking mental imagery, (2) product images with concrete backgrounds + product descriptions without concrete words evoking mental imagery, (3) product images with solid white backgrounds + product descriptions including concrete words evoking mental imagery, and (4) product images with solid white backgrounds + product descriptions without concrete words evoking mental imagery (See Figure 3.4). Across all four

conditions, size of product image, price, and the amount of product description except for imagery evoking words were consistent (See Appendix K).

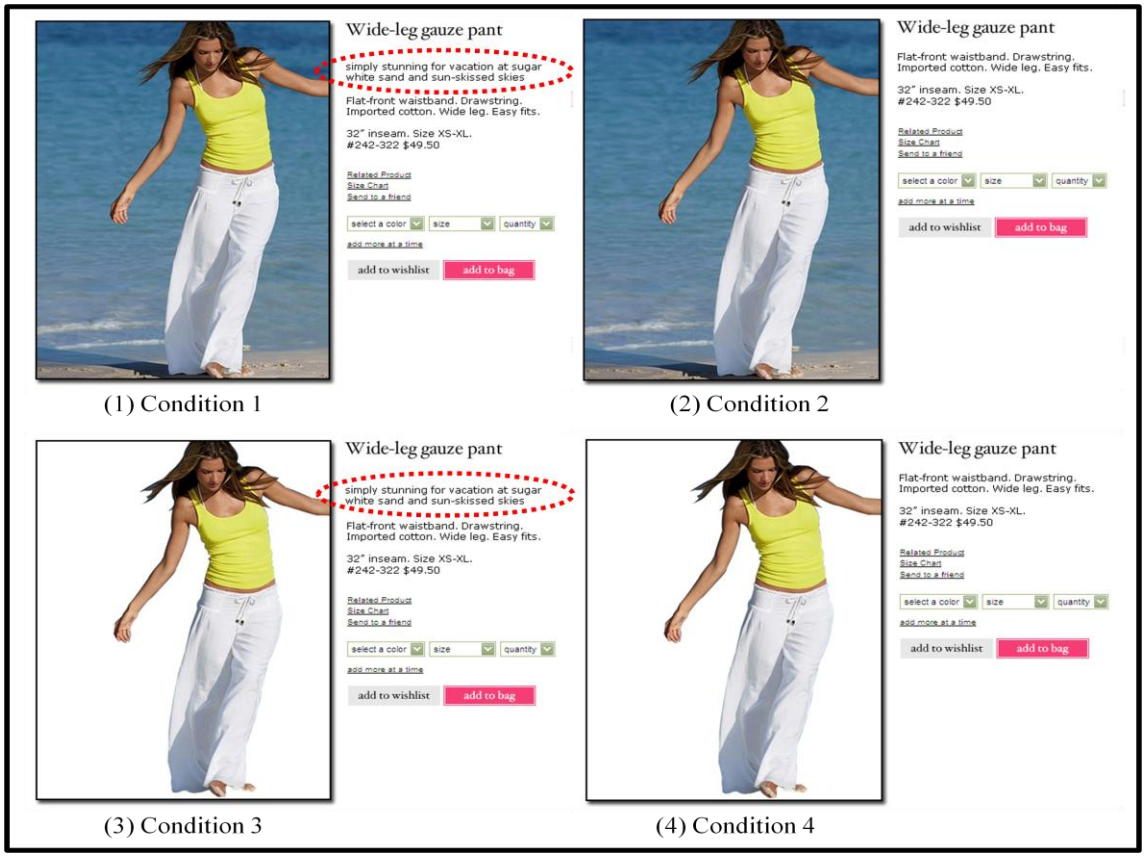

Figure 3.4. Examples of four experimental conditions

Participants and Procedure

This research was reviewed and classified as exempt by the Oregon State University Institutional Review Board (IRB) and was assigned a protocol number 4249 (See Appendix N).

The data were collected from a random sample of female college students in Oregon State University. The Office of the University Registrar randomly extracted 4,000 students email addresses from among all female students enrolled at Oregon State University. College students are major Internet shoppers (Lee & Johnson, 2002) and comprise 63% of shoppers at online apparel and beauty websites (Internet Retailer, 2004). Thus, college women were deemed appropriate for the study. The participants were randomly assigned to one of four treatment conditions. Thus, 1,000 potential participants were assigned to each experimental condition.

Invitation emails were sent to these 4,000 female college students, each including one of the four URLs. When the participants clicked on the URL, they viewed an informed consent document. Participants who decided to continue were asked to read the instructions and a scenario for the experiment: "*One day, you are browsing the Internet. You have been given a $100 gift certificate to make a purchase from the website, "www.sugarfactory.com". Recently, you have recognized the need for clothes for this summer vacation. You are planning to purchase clothes with the gift certificate from this website. Please browse each garment carefully as if you are actually shopping online.*" Next, participants were asked to browse three apparel web pages presenting each apparel item and to answer the survey questions. All apparel items were presented in both visual and verbal forms. One reminder was emailed after seven days to non-respondents.

Instrument Development

Mental Imagery

Mental imagery was measured on a scale used by Walters et al. (2007). The researchers modified the previous mental imagery scale to be used in consumption situations, and the scale was found to be reliable (α = .84 to .93). The items were used on a travel website using destination images. Therefore, the items were modified for apparel websites. Thirteen items included "I imagined that I was actually wearing the clothes shown on the website," and "I fantasized about wearing the clothes," with end points from 1 (strongly disagree) to 7 (strongly agree). All measurement scales are presented in Appendix L.

Positive Emotion

Based on the results of Pretest 4, the selected items were used to measure positive emotion evoked through mental imagery. Ten emotional words selected from Pretest 4 were amusement, pleasure, delighted, joyful, stimulated, contented, happy, hopeful, relaxed, and satisfied. Subjects were asked to specify how strongly the product presentation on the website made them feel, based on end points from 1(very slightly) to 7 (very strongly).

Perceived Risk

Perceived risk was measured by a 7-point rating scale used by Laroche, Kim, & Zhou (1996). Questions included, "There is a good chance I will make a mistake if I

purchase this item", "I have the feeling that purchasing this item will really cause me lots of trouble", " This item is a very risky purchase", and "I will incur some risk if I buy this item in the next twelve months" (7 = strongly agree, 1 = strongly disagree), and reliability was .81.

Attitude toward a Website

Attitude toward a website was measured using 7-point rating scales from (7 = good, pleasant, favorable, and like) to (1 = bad, unpleasant, unfavorable, and dislike). These items have been employed successfully in a number of previous brand attitude studies (Alan & Kenneth, 1998; Anand & Sternthal, 1992), and reliabilities of the scale ranged from .85 to .98.

Behavioral Intentions

Three items used by Kwon and Lennon (2009) were adopted (Cronbach's *alpha* > .94). For example, questions, such as "I would purchase the garment which I evaluated", "I would be willing to pay extra in order to buy the garment", "I would recommend the website to my friends and family", and "I would return to the website and browse it to shop for clothing items" were asked. All four items used 7-point semantic differential scales (1 = unlikely, improbably, not possible and 7 = likely, probably, possible).

Style of Processing

Scale items designed to measure the style of processing (SOP) included twenty-two items. Subjects were asked to answer questions such as, "I enjoy doing work that requires the use of words", and "there are some special times in my life that I like to relive by mentally picturing just how everything looked." Each item had a range of 7, anchored by "always true (7)" to "always false (1)." The scale was developed by Childers et al., (1985), with reliability measured by Burns et al. (1993) ranging from .74 to .75.

Demographic Information

Demographic information including age, ethnicity, and major were collected from the participants at the end of the questionnaire, and participants' online shopping and browsing experience were assessed. Items assessing participants' online experience included: "How often do you use the Internet? (1= never, 7 = everyday); How often do you browse for products online except for apparel? (1= never, 7 = more than 20 times a month); How often do you purchase products online except for apparel? (1= never, 7 = more than 10times a month); How often do you browse for apparel online website? (1= never, 7 = more than 20 times a month); How often do you purchase apparel online? (1= never, 7 = more than 10 times a month)". Scores from each measure were summed and averaged to be used as the overall score for each dependent variable.

ANALYSES AND RESULTS

Description of Participants

Demographic Characteristics of Participants

Of the randomly selected students who were sent invitation emails, a sample of 571 female students participated in this study, for a response rate of 14.3% (571/4000). Among the 571 responses, 21 respondents were eliminated from the analysis since 7 respondents overlapped with participants of pretests and 14 respondents gave anomalous responses to items. Therefore, answers from 550 participants were determined to be usable and included in the data.

The mean age of participants was 23.45 (*SD* = 6.28), with a range of 19 to 64. The majority of the participants' ages were between 20 and 22 (68.5%). Caucasian predominated (80.4%), followed by Asian/Asian Americans (13.1%), Hispanic Americans (3.1%), and African Americans (.4%).

The academic majors of the participants varied and were classified into ten colleges, such as Health and Human Sciences (34.2%), Science (17.1%), Liberal Arts (11.3%), Business (10.9%), Agricultural sciences (6.5%), Engineering (5.8%), Education (4.2%), and Pharmacy (4.0%). Regarding the academic standing of the participants, seniors were the largest group accounting for 43.8% of all participants, and juniors and sophomores combined accounted for 39.5% of the participants. Descriptive statistics for the demographic characteristics of the participants can be found in Table 3.2.

Table 3.2. Demographic profile of participants

Variable	Category	Mean	Frequency	Percent
Age	Under 20	23.45	23	4.2
	20 - 22	(*SD* = 6.28)	377	68.5
	23 - 25		60	10.9
	26 - 30		38	6.9
	Over 31		50	9.1
	Unknown		2	.4
Ethnic background	African American		2	.4
	Asian/Asian American		72	13.1
	Caucasian		442	80.4
	Hispanic American		17	3.1
	Native American		10	1.8
	Other		7	1.3
Academic major	Agricultural Sciences		36	6.5
	Business		60	10.9
	Liberal Arts		62	11.3
	Education		23	4.2
	Engineering		32	5.8
	Forestry		15	2.7
	Health & Human Sci.		188	34.2
	Pharmacy		22	4.0
	Science		94	17.1
	Other		17	3.1
Academic standing	Freshman		5	.9
	Sophomore		55	10.0
	Junior		162	29.5
	Senior		241	43.8
	Graduate		79	14.3
	Other		8	1.5
Total			550	100

Participants' Internet Shopping Experience

Overall, participants said that they used the Internet everyday (90.0%). About 45.4% of the participants reported that they browsed online for products - except for apparel - more than 13 times a month, and about 16.6% purchased products online more

than 7 times a month. For monthly apparel shopping behaviors, about 42.2% of the participants browsed apparel online more than 13 times. However, only 13% of the participants purchased apparel online more than 7 times a month (See Table 3.3). Compared to the frequency of online browsing behaviors, the number of purchasing products online was very low. Also, 15.6% of the participants never purchased apparel online, which was much higher than the number of other products purchased online (5.6%). Compared to the percentage of people who browse products online, the percentage of people who actually purchase products online is still low.

Table 3.3. Participants Internet shopping experience (N = 550)

# of times per month		Never	1-6	7-12	13-18	19-24	25-30	30-	missing
Internet use	*f*	1	1	4	12	12	24	495	1
	%	.2	.2	.7	2.2	2.2	4.4	90.0	.2
		Never	1-4	5-8	9-12	13-16	17-20	20-	missing
Online shopping	*f*	10	74	108	108	115	66	69	0
	%	1.8	13.5	19.6	19.6	20.9	12.0	12.5	0
Online shopping for apparel	*f*	31	79	113	93	106	69	59	2
	%	5.6	14.4	20.5	16.9	19.3	12.2	10.7	.4
		Never	1-2	3-4	5-6	7-8	9-10	10-	missing
Online purchase	*f*	47	192	124	95	66	13	12	1
	%	8.5	34.9	22.5	17.3	12.0	2.4	2.2	.2
Online apparel purchase	*f*	86	204	99	87	49	17	5	3
	%	15.6	37.1	18.0	15.8	8.9	3.1	.9	.5

Manipulation Checks

Manipulation checks were performed to determine whether or not the manipulation of mental imagery was effective. The same mental imagery scale items

which were asked in the main experiment were used for the manipulation check. For the visual information manipulation (concrete background vs. solid background), there was a significant difference in mental imagery ($t = 2.27$, $df = 548$, $p < .05$). Participants experienced greater mental imagery when they were exposed to product images with concrete backgrounds ($M = 4.38$, $SD = 1.27$) than when they were exposed to product images with solid backgrounds ($M = 4.14$, $SD = 1.18$). However, the effect of verbal information on mental imagery was not significantly different between verbal product information with concrete words and without the concrete words ($t = .18$, $df = 548$, $p = .85$).

Preliminary Analyses

This study included five dependent variables including mental imagery, emotion, perceived risk, attitude toward a website, and behavioral intentions. Results of descriptive statistics and exploratory factor analyses for the variables are presented in this section.

Mental Imagery

An exploratory factor analysis using maximum likelihood estimation with varimax rotation was conducted to test the unidimensionality of the scale. A minimum eigenvalue of 1.0 was used as a criterion to control the number of factors extracted. As a result, two factors were identified in the mental imagery scale (See Appendix M, Table M.6), which was consistent with previous research (Walters et al., 2007). Based on

Walters et al.'s study, the two factors in the mental imagery were named "elaboration" and "quality". Cronbach's *alpha* estimates for elaboration and quality were .92 and .96, respectively. Elaboration of mental imagery and quality of mental imagery were used as latent variables in the proposed model. The average scores of participants' elaboration and quality dimensions were 4.16 and 4.52 with a possible range of 1 to 7. The descriptive statistics for each measurement and Cronbach's *alpha* estimates were summarized in Table 3.4.

Table 3.4. Descriptive statistics for dependent variables (N = 550)

Variable	Cronbach's *alpha*	Min.	Max.	Mean	*SD*
Elaboration of mental imagery	.92	1	7	4.16	1.30
Quality of mental imagery	.96	1	7	4.52	1.43
Positive emotion	.96	1	7	4.67	1.29
Perceived risk	.90	1	7	2.72	1.36
Attitude toward a website	.96	1	7	5.44	1.04
Intention to purchase	.95	1	7	4.37	1.60
Intention to spend extra money	.95	1	7	2.29	1.35
Intention to recommend a website	.97	1	7	3.98	1.54
Intention to revisit a website	.98	1	7	4.74	1.57

Positive Emotion

Based on the results of Pretest 4, ten positive emotion items were selected for the main study. The ten emotions selected were amusement, pleasure, delighted, joyful, stimulated, contented, happy, hopeful, relaxed, and satisfied. In the main experiment, after browsing a mock apparel website, participants were asked to rate how well these emotional terms reflected their emotions using a 7-point scale.

An exploratory factor analysis using maximum likelihood estimation with varimax rotation was conducted to examine the unidimensionality of the ten items. A minimum eigenvalue of 1.0 was used as a criterion to control the number of factors extracted, and one factor was identified, with an eigenvalue of 7.14. The factor accounted for 71.37% of the variation in the positive emotion scale. Reliability was acceptably high (α = .96). Therefore, scores from the ten positive emotion items were summed and averaged to be used as a dependent variable in Part I. Also, the dependent variable was used as a single indicator for positive emotion construct in Part II. The average score of the positive emotion scale was 4.67 with a possible range of 1 to 7.

Perceived Risk

The reliability of the perceived risk measure was .90. The mean value of the four items was 2.72 with a possible range of 1 to 7.

Attitude toward a Website

A Cronbach's *alpha* was calculated to check reliability of four items of attitude toward a website and found to be reliable (α = .95). The mean score of attitude was 5.44 with a possible range of 1 to 7.

Behavioral Intentions

Four types of behavioral intention including intention to purchase, intention to spend extra money, intention to recommend the website, and intention to revisit the

website, were measured using three semantic differential scale items (i.e., unlikely – likely, improbable – probable, and not possible – possible). Cronbach's *alpha* for each behavioral intention was between .95 and .98. The summed and averaged score for each behavioral intention type was used as dependent variables of MANOVA in Part I and used as an indicator in a CFA measurement model and a structural equation model in Part two (See Figure 3.5). The mean scores for behavioral intentions were 4.37, 2.29, 3.98, and 4.74, respectively, with a possible range of 1 to 7.

Style of Processing

The style of processing (SOP) scale was measured using 22 items developed by Childers et al. (1985). Previous researchers (Burns et al., 1993; Childers et al., 1985) identified two factors (e.g., verbal information processing and visual information processing) of the SOP. Items tapping verbal information processing were reverse coded to be consistent with the visual information processing score.

In order to determine dimensions of the SOP, a factor analysis was conducted by employing maximum likelihood estimation and varimax rotation. Items with a factor loading below .40 were deleted, and finally a two-factor model with 16 items was identified by the factor analysis (See Appendix M, Table M.7). The first factor (verbalizers) included six items whereas the second factor (visualizers) included ten items. Cronbach's *alphas* for the two factors were .83 and .81, indicating internal consistency of the scale. Six items and ten items were summed and averaged separately to be used as the overall score for verbalizers and visualizers. Following previous studies

(Burns et al., 1993; Gould, 1990), a median-split was used to divide the participants into two groups. People below the median (*Med* = 4.40) were categorized as a verbalizer group whereas people above the median value were categorized as a visualize group. As a result, 275 (50%) participants were included in the verbalizers and 275 (50%) participants were included in the visualizers. There was a significant difference in SOP between the verbalizers ($M = 3.06$, $SD = 1.08$) and the visualizers ($M = 5.16$, $SD = .88$) ($t = 29.11$, $df = 548$, $p < .001$).

Measurement Model Specification

Based on a two-step modeling approach (Anderson & Gerbing, 1988), a confirmatory factor analysis (CFA) was conducted via AMOS 18.0. In order to estimate reliability and validity of the items for each latent construct, the measurement model was evaluated and then adjusted based on theoretical and statistical considerations. The measurement model can be respecified by relating a problematic indicator to a different factor, deleting the indicator from the model, associating the indicator (observed variable) with multiple factors, or correlating measurement errors (Anderson & Gerbing, 1988). In general, if a factor loading from an indicator to a latent variable is lower than .6 and if squared multiple correlation (SMC) is lower than .4, the measurement model needs to be reconsidered (Bagozzi & Yi, 1988).

Maximum likelihood estimation was employed to assess parameters for the CFA. There were six latent variables and twenty six observed variables in the proposed model.

However, since one latent variable (positive emotion) had only one indicator, five latent variables and twenty five observed variables were examined. Based on the values of factor loadings and SMC suggested by Bagozzi and Yi (1988) and the second method provided by Anderson and Gerbing (1988), indicators with low factor loadings or with low SMC values were deleted from the model.

In this model, one indicator of behavioral intention (B2) and three indicators of elaboration of mental imagery (V1, V2 and V3) were excluded from the measurement model because they had low factor loadings or low SMC values. Modification indices (MI) assessing possible misspecifications of the model were also examined. Based on the MIs, V7, V8, V11, and R2 were eliminated, and error terms between A2 and A4 and between B3 and B4 were correlated. Correlated measurement errors indicate that observed variables (indicators) of the error terms measure the same things which are not represented by the model. In other words, measurement errors of A2 and A4 shared the same aspects which were not measured by A2 and A4 (See Figure 3.5).

Based on the respecified measurement model, the overall fit of the measurement model was evaluated. Chi-square statistic is a basic fit index to test an overall fit of a model (Jöreskog & Sörbom, 1993). Significant chi-square statistic indicates a poor fit whereas non-significant value designates a good fit. In this model, the result of the CFA showed a significant chi-square statistic (χ^2 = 170.56, *df* = 107, *p* = .000). However, since chi-square statistic tends to be significant with a large sample size by increasing χ^2 value (Kaplan, 1990), other fit indices, such as RMSEA, CFI, NFI, and IFI were taken into consideration. Hair, Black, Babin, Anderson, & Tatham (2006) provided criteria to be

used to examine an overall model fit (See Table 3.5). Although the results of CFA showed the significant chi-square statistic due to the large sample size (N = 550), other fit indices indicate satisfactory fit of the model to the data (RMSEA = .033 [90% C.I. = (.023; .042)], NFI = .98, CFI = .99, IFI = .99, and TLI = .99).

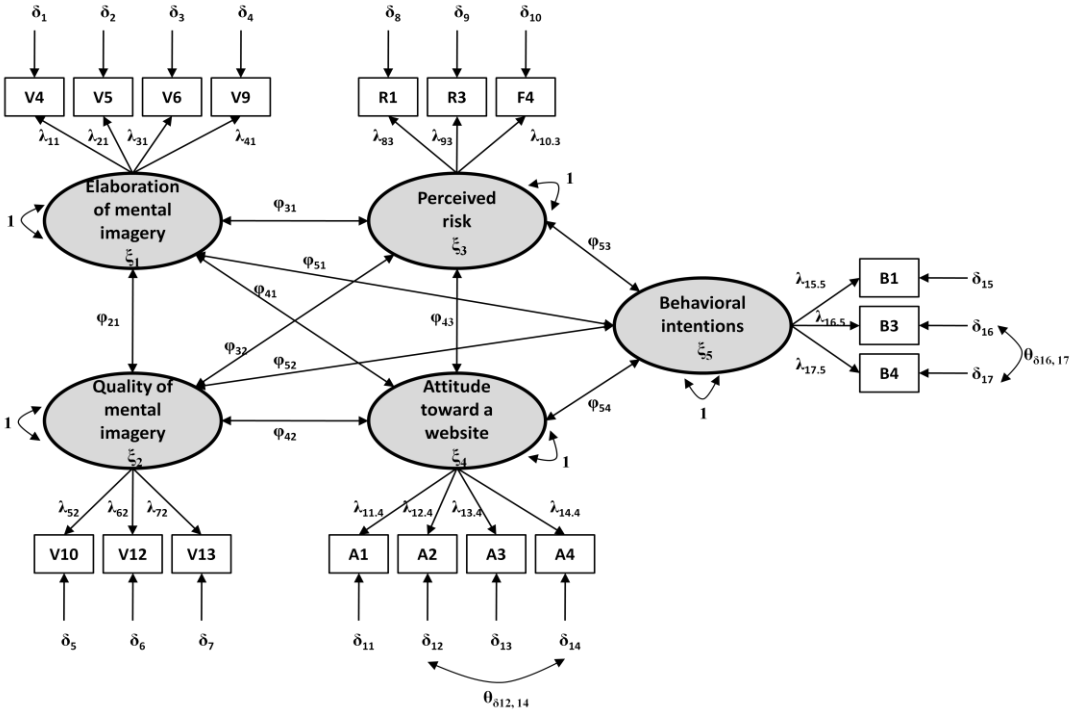

Figure 3.5. A CFA model for final measurement items

Table 3.5. A summary of measurement fit indices for a close fit model

Index by Hair et al. (2006)	N > 250		
	m < 12	12 < m < 30	$m \geq 30$
χ^2	expected to have significant p values		
CFI (TLI)	> .95	> .92	> .90
RMSEA	< .07	< .07	< .07

Note. m = number of indicators

In order to assess construct validity, convergent validity and discriminant validity were examined. Convergent validity can be achieved if all factor loading values are high and statistically significant (Anderson & Gerbing, 1988). More specifically, Bae (2007) suggested that factor loadings should be at least .5 and ideally greater than .7. The results from CFA of the respecified measurement model revealed that all path coefficients in the CFA model were greater than .7 and statistically significant at the *p* value of .001 level, providing evidence of convergent validity (See Appendix M, Table M.8).

Discriminant validity was assessed using chi-square difference tests between an unconstrained model and constrained models (Anderson & Gerbing, 1988). For example, by setting a correlation to 1 between two constructs (e.g., elaboration and quality: constrained model), this constrained model can be compared to the unconstrained model. When the chi-square difference test is significant, discriminant validity is achieved between the two constructs (Bagozzi & Phillips, 1982). Since all chi-square difference tests were significant in this study (See Table 3.6), discriminant validity between constructs was established. In addition to chi-square difference test, discriminant validity can be examined using the confidence interval (CI) of correlation coefficients of latent variables, and 95% of confidence interval not including 1.0 indicates evidence of discriminant validity. As shown in Table 3.7, all confidence intervals did not include 1.0, thus achieving discriminant validity.

Table 3.6. Chi-square difference tests for discriminant validity

Constraint	$\chi 2$	*df*	$\Delta\chi 2$	Δdf
Unconstrained model	107.56	107		
Elaboration ↔ Quality	757.90	108	650.34***	1
Elaboration ↔ Perceived risk	1104.32	108	996.76***	1
Elaboration ↔ Attitude toward a website	1051.39	108	943.83***	1
Elaboration ↔ Behavioral intention	348.70	108	241.14***	1
Quality ↔ Perceived Risk	1106.95	108	999.39***	1
Quality ↔ Attitude toward a website	1572.48	108	1464.98***	1
Quality ↔ Behavioral intention	379.69	108	272.13***	1
Perceived risk ↔ Attitude toward a website	589.39	108	481.83***	1
Perceived risk ↔ Behavioral intention	450.54	108	342.98***	1
Attitude toward a website ↔ Behavioral intention	318.62	108	211.06***	1

Note. $*p < .05$, $**p < .01$, $***p < .001$;
$\Delta\chi 2 = \chi 2$ (constrained) - $\chi 2$ (unconstrained); $\Delta df = df$ (constrained) – df (unconstrained)

Table 3.7. Correlation coefficients and confidence interval for discriminant validity

	Correlation coefficient	*SE*	Confidence interval	
Elaboration ↔ Quality	.65	.03	.59	.71
Elaboration ↔ Perceived risk	.42	.04	.34	.50
Elaboration ↔ Attitude toward a website	-.12	.05	-.22	-.02
Elaboration ↔ Behavioral intention	.63	.04	.55	.71
Quality ↔ Perceived risk	-.14	.05	-.24	-.04
Quality ↔ Attitude toward a website	.44	.04	.36	.52
Quality ↔ Behavioral intention	.58	.04	.50	.66
Perceived risk ↔ Attitude toward a website	-.37	.04	-.45	-.29
Perceived risk ↔ Behavioral intention	-.35	.05	-.45	-.25
Attitude toward a website ↔ Behavioral intention	.71	.03	.65	.77

Hypotheses Testing

In this research, the effects of visual and verbal information on consumers' mental imagery and moderating effects of SOP on mental imagery were described in Part I

(Hypotheses 1 trough 4). Also, relationships among consumers' internal states and their responses were presented in Part II (Hypotheses 5 through 14) (See Figure3.6).

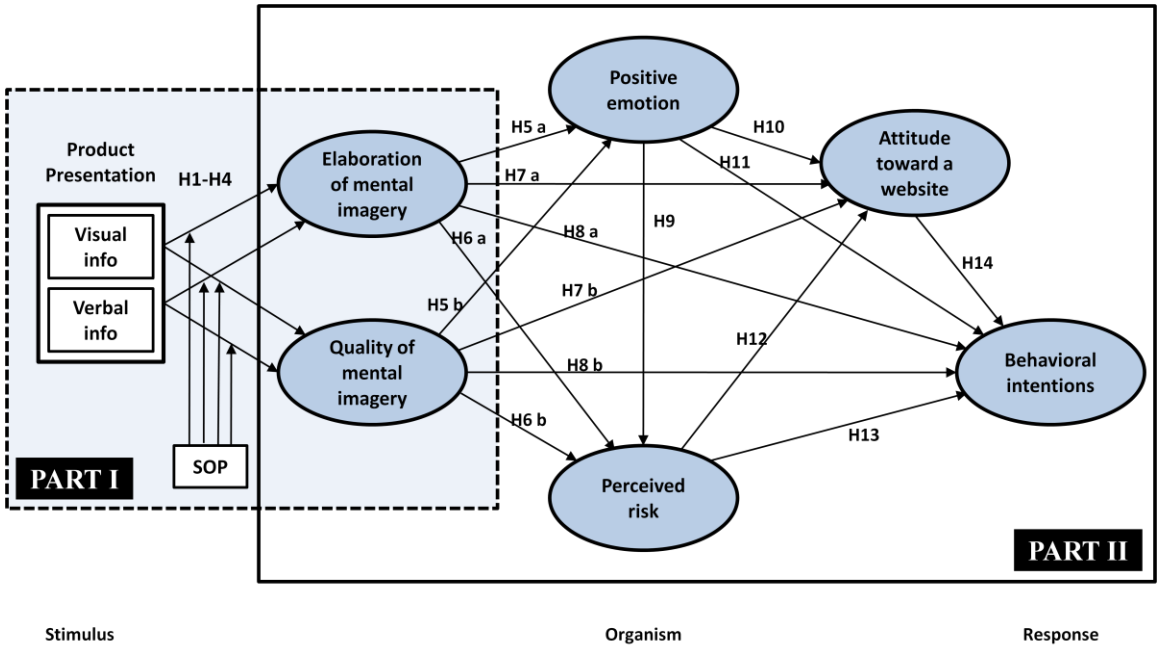

Figure 3.6. Proposed model of the study

Part I: Multivariate Analysis of Variance

Part I was tested by using a 2 (visual information: concrete background image vs. solid white background image on a product picture) x 2 (verbal information: product description with concrete words vs. product description without concrete words) x 2 (SOP: visualizer vs. verbalizer) between-subject multivariate analysis of variance.

Hypotheses Testing

Table 3.8. Hypotheses 1 through 4

	Hypotheses
H1	*As compared to people exposed to a product image with a solid background, those exposed to a product image with a concrete background will experience greater mental imagery (a: elaboration, b: quality)*
H2	*As compared to people exposed to less concrete verbal information, those exposed to more concrete verbal information will experience greater mental imagery (a:elaboration, b: quality)*
H3	*A product image with a concrete background and concrete verbal information will interact to affect mental imagery (a: elaboration, b: quality)*
H4	*The style of information processing will moderate the relationship between product presentation and mental imagery(a: elaboration, b: quality)*

There was a significant multivariate main effect for visual information on mental imagery [Wilks' $\lambda = .99$. F (2, 541) = 3.20, $p < .05$, partial $\eta^2 = .012$]. Therefore, a follow-up analysis of variance was performed to determine which dependent variables were affected by the visual information. The results showed that there was a significant main effect for visual information on elaboration of mental imagery [F (1, 542) = 6.40, $p < .05$, partial $\eta^2 = .012$]. However, a main effect for visual information on quality of mental imagery was not significant. Inspection of cell means revealed that participants exposed to a product image with a concrete background experienced greater elaboration of mental imagery (M = 4.28, SD = 1.36) than those exposed to a product image with a solid background (M = 4.02, SD = 1.22). Therefore, only H1a was supported. The results

of multivariate analysis of variance and analysis of variance are described in Table 3.9 and Table 3.10, and descriptive statistics are summarized in Table 3.11.

Table 3.9. Multivariate analysis for visual and verbal information on elaboration and quality of mental imagery

	Wilks' λ	F (2, 541)	p	Partial Eta^2
visual info	.982	3.20	.042**	.012
verbal info	.994	1.76	.173	.006
SOP	.86	44.72	.000***	.142
visual info x verbal info	.996	1.06	.347	.004
visual info x SOP	.988	3.39	.034*	.012
verbal info x SOP	.998	.45	.639	.002
visual info x verbal info x SOP	.984	4.34	.014**	.016

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

Table 3.10. Results of analysis of variance

		F (1, 542)	p	Partial Eta^2
Elaboration	visual info	6.40	.012*	.012
	SOP	84.49	.000***	.135
	visual info x SOP	6.77	.010*	.012
	visual info x verbal info x SOP	8.69	.003**	.016
Quality	SOP	51.89	.000***	.087

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

Table 3.11. Summary table of descriptive information for main effect of visual information and interaction effects of visual information x SOP

	Main effect of visual info		Interaction effect of visual info x SOP			
			Concrete background		Solid background	
	Concrete background	Solid background	Verbalizer	Visualizer	Verbalizer	Visualizer
Elaboration	4.28 (1.36)	4.02 (1.22)	3.66 (1.22)	4.84 (1.23)	3.71 (1.16)	4.36 (1.20)

Note. First values represent means and values enclosed in parentheses represent standard deviations

However, the results from the MANOVA showed that there was no multivariate main effect for verbal information on elaboration and quality of mental imagery. In addition, multivariate interaction effect of visual information by verbal information on elaboration and quality of mental imagery was not significant. Therefore, H2 and H3 were not supported.

Although the effects of SOP on mental imagery were not predicted in this study, the main effects of the SOP were significant from the analysis [Wilks' λ = .86. F (2, 541) = 44.72, p < .001, partial η^2 = .142]. A follow-up ANOVA also revealed significant main effects of the SOP on elaboration [F (1, 542) = 84.49, p < .001, partial η^2 = .135] and quality [F (1, 542) = 51.89, p < .001, partial η^2 = .087] of mental imagery. Participants who process information visually experienced greater elaboration (M = 4.63, SD = 1.30) and quality (M = 4.94, SD = 1.21) of mental imagery than those who process information verbally (elaboration: M = 3.69, SD = 1.19; quality: M = 4.09, SD = 1.51) regardless of different product presentation types.

Hypothesis 4 was to examine moderating effects of SOP on mental imagery, and there were three interaction relationships testing the moderating effects of the SOP: (1) visual information x SOP, (2) verbal information x SOP, and (3) visual information x verbal information x SOP. The MANOVA results revealed that there was a significant multivariate interaction effect of visual information by SOP on mental imagery [Wilks' λ = .99. F (2, 541) = 3.39, p < .05, partial η^2 = .012], but a multivariate interaction effect for verbal information and SOP was not significant. Also, a multivariate interaction effect for

visual information x verbal information x SOP was significant [Wilks' λ = .98. F (2, 541) = 4.34, $p < .05$, partial $\eta^2 = .016$].

Results of follow-up ANOVAs showed significant interaction effects of visual information by SOP on elaboration of mental imagery [F (1, 542) = 6.77, $p < .05$, partial $\eta^2 = .012$], but not on quality of mental imagery. Simple effects tests further indicated that the effects of visual information on elaboration were significant only for participants in a high SOP group (visualizers) [F (1, 542) = 13.08, $p < .000$, partial $\eta^2 = .024$]. In other words, compared to verbalizers, visualizers experienced greater elaboration of mental imagery (M = 4.84, SD = 1.23) in the concrete background condition than in the solid background condition (M = 4.36, SD = 1.20) (See Table 3.11 & Figure 3.7).

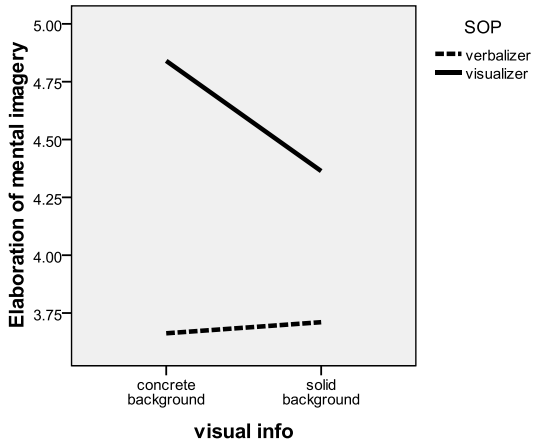

Figure 3.7. Visual information by SOP interaction effect on elaboration of mental imagery

Also, there was a significant interaction effect for visual information, verbal information, and SOP on elaboration of mental imagery [F (1, 542) = 8.69, $p < .01$,

partial η^2 = .016]. However, an interaction effect for visual information, verbal information, and SOP on quality of mental imagery was not significant. In other words, the interaction of visual information by verbal information on elaboration of mental imagery was significantly different depending on the level of SOP (i.e., visualizers vs. verbalizers) (See Figure 3.8).

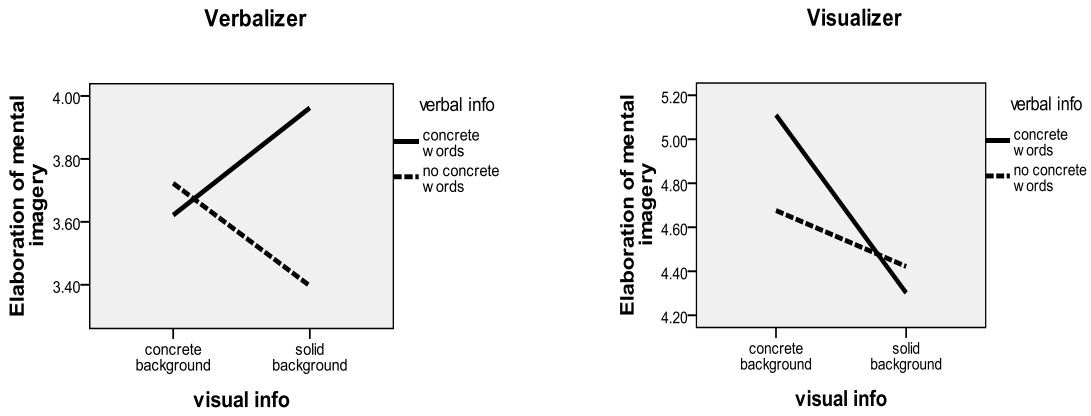

Figure 3.8. Interaction effects of visual information by verbal information in visualizers and verbalizers on elaboration of mental imagery

The results of simple effects tests were analyzed at each level of SOP group. When verbalizers were exposed to solid backgrounds, the effects of verbal information were significantly different on elaboration [F (1, 542) = 7.57, p < .01, partial η^2 = .014]. Inspection of cell means revealed that verbalizers experienced greater elaboration of mental imagery (M = 3.96, SD = 1.08) when solid backgrounds and concrete words were present (See Table 3.12). However, when verbalizers were exposed to concrete backgrounds, the effects of verbal information were not significant.

On the other hand, when visualizers were exposed to concrete backgrounds, the effects of verbal information were significantly different on elaboration [F (1, 542) = 4.68, $p < .05$, partial $\eta^2 = .009$], but not on quality. In other words, visualizers had greater elaboration of mental imagery when concrete backgrounds and concrete words (M = 5.11, SD = 1.27) were present (See Table 3.12). However, when visualizers were exposed to solid backgrounds, the effects of verbal information did not differ. Thus, H4 was supported.

Table 3.12. Summary table of descriptive information for interaction effects of visual information x verbal information x SOP on mental imagery

	Verbalizers		Visualizers	
	Presence of concrete words	Absence of concrete words	Presence of concrete words	Absence of concrete words
Elaboration of mental imagery				
Concrete background	3.62 (1.18)	3.69 (1.29)	**5.11 (1.27)**	**4.68 (1.19)**
Solid background	**3.96 (1.08)**	**3.40 (1.19)**	4.18 (1.12)	4.46 (1.22)

Note. First values represent means and values enclosed in parentheses represent standard deviations. Significant effects were represented in bold numbers

Part II: Structural Equation Modeling

Part II establishes the relationships among elaboration of mental imagery, quality of mental imagery, positive emotion, perceived risk, attitude toward a website, and behavioral intention. Elaboration and quality of mental imagery were exogenous latent variables and positive emotion, perceived risk, attitude toward a website, and behavioral intention were endogenous variables. By pooling across experimental groups, a structural

equation modeling was performed with a single group to test hypotheses 5 to 14. Maximum likelihood function was utilized to estimate parameters of structural equation model and to test relationships among variables using AMOS 18.0. One loading on each latent variable was set to 1.0 (Bae, 2007). Also, error variance of emotion was set to zero because emotion had only one indicator (Jöreskog & Sörbom, 1993).

Model Fit

An overall chi-square was 190.23 (df = 119, p < .001). The NFI was .98, CFI was .99, IFI was .99, and TLI was .99. The RMSEA was .033 with 90% confidence interval of .024 and .042. Even though chi-square statistic was significant due to the large sample size, other fit indices suggest an acceptable fit to the data.

Hypotheses Testing

Hypothesis 5: Mental imagery will be positively associated with positive emotion (a: elaboration, b: quality).

Hypothesis 5 proposed that elaboration and quality of mental imagery evoked from product presentation will be positively associated with positive emotion. The results showed significant positive relationships between elaboration of mental imagery and positive emotion (γ_{11} = .41, t = 7.73, p < .001) and between quality of mental imagery and positive emotion (γ_{12} = .24, t = 4.82, p < .001) (See Figure 3.9 & Table 3.13),

implying that the greater the mental imagery evoked, the more positive the emotion experienced. Therefore, H5 was supported.

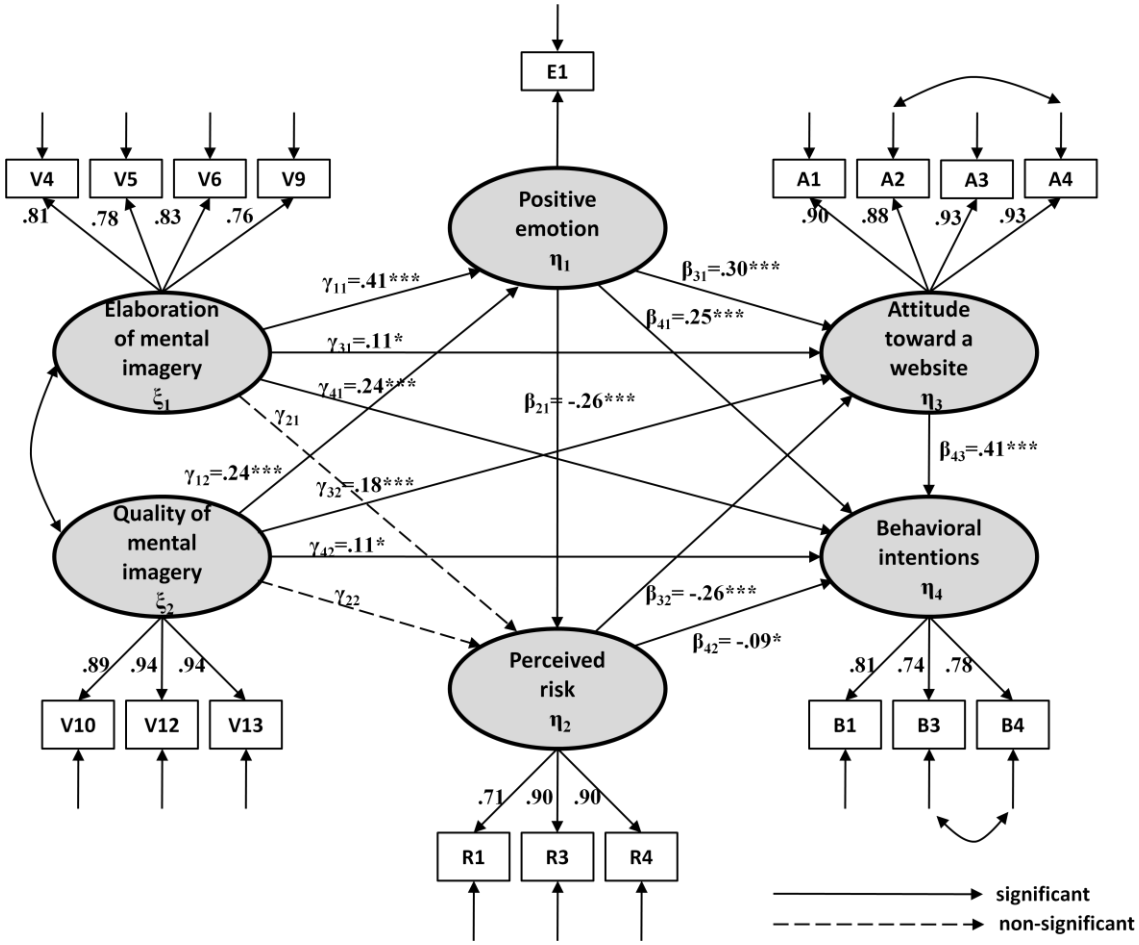

Figure 3.9. Standardized estimates and significance tests for H5 to H14
(*p < .05, **p < .01, ***p < .001)

Table 3.13. Results from the SEM for testing hypotheses

Hypotheses		Parameter	Est.	*SE*	*t*
Structural path					
H5 a	Elaboration (ξ_1) → Positive emotion (η_1)	γ_{11}	.41	.05	7.73***
H5 b	Quality (ξ_2) → Positive emotion (η_1)	γ_{12}	.24	.05	4.82***
H6 a	Elaboration (ξ_1) → Perceived risk (η_2)	γ_{21}	.06	.07	.91
H6 b	Quality (ξ_2) → Perceived risk (η_2)	γ_{22}	-.05	.06	-.73
H7 a	Elaboration (ξ_1) → Attitude toward a website (η_3)	γ_{31}	.11	.04	1.92*
H7 b	Quality (ξ_2) → Attitude toward a website (η_3)	γ_{32}	.18	.04	3.41***
H8 a	Elaboration (ξ_1) → Behavioral intentions (η_4)	γ_{41}	.24	.05	4.42***
H8 b	Quality (ξ_2) → Behavioral intentions (η_4)	γ_{42}	.11	.04	2.21*
H9	Positive emotion (η_1) → Perceived risk (η_2)	β_{21}	-.26	.06	-4.65***
H10	Positive emotion (η_1) → Attitude toward a website (η_3)	β_{31}	.30	.04	6.49***
H11	Positive emotion (η_1) → Behavioral intentions (η_1)	β_{41}	.25	.04	5.50***
H12	Perceived risk (η_2) → Attitude toward a website (η_3)	β_{32}	-.26	.03	-6.80***
H13	Perceived risk (η_2) → Behavioral intentions (η_4)	β_{42}	-.09	.03	-2.46*
H14	Attitude toward a web (η_3) → Behavioral intentions (η_4)	β_{43}	.41	.05	9.10***
Model fit					
	Chi-square	190.23	(*df* = 119)		
	RMSEA	.033	90% C. I. (.024; .042)		
	TLI	.99			
	NFI	.98			
	CFI	.99			
	IFI	.99			

Hypothesis 6: Mental imagery will be negatively associated with perceived risk (a: elaboration, b: quality).

Hypothesis 6 addresses the negative relationship between mental imagery from product presentation and perceived risk. However, the results revealed that there were no significant relationships between elaboration of mental imagery (γ_{21} = .06, t = .91, p = .36) and perceived risk and between quality of mental imagery and perceived risk (γ_{22} = -.05, t = -.73, p = .47), failing to support H6.

Hypothesis 7: Mental imagery will be positively associated with attitude toward a website (a: elaboration, b: quality).

Hypothesis 7 postulated positive associations between mental imagery and attitude toward the website. The results showed a marginally significant positive relationship between elaboration of mental imagery and attitude toward the website (γ_{31} = .11, t = 1.92, p = .05) and a significant positive relationship between quality of mental imagery and positive emotion (γ_{32} = .18, t = 3.41, p < .001). Participants who experienced greater mental imagery from the product presentation had a better attitude toward the website than those who experienced less mental imagery. Therefore, H7 was supported.

Hypothesis 8: Mental imagery will be positively associated with behavioral intentions (a: elaboration, b: quality).

Hypothesis 8 predicted a positive relationship between mental imagery and behavioral intention. Structural path coefficients found that elaboration of mental imagery was positively related to behavioral intention (γ_{41} = .24, t = 4.42, p < .001). Also, quality of mental imagery was positively associated with behavioral intention (γ_{42} = .11, t = 2.21, p < .05), supporting H8. Participants who experienced greater mental imagery from the product presentation had greater behavioral intention than those who experienced less mental imagery.

Hypothesis 9: Positive emotion will be negatively associated with perceived risk.

Hypothesis 9 examined the relationship between positive emotion and perceived risk. As expected, positive emotion was negatively associated with perceived risk (β_{21} = -.26, t = -4.65, p < .001). Participants who experienced more positive emotion had less perceived risk than those experienced less positive emotion. Thus, H9 was supported.

Hypothesis 10: Positive emotion will be positively associated with attitude toward a website.

Hypothesis 10 predicted that there would be a positive relationship between positive emotion and attitude toward a website. The result revealed positive emotion was significantly and positively associated with attitude toward a website (β_{31} = .30, t = 6.49, p < .001). Participants who experienced more positive emotion had more favorable attitude toward a website than those with less positive emotion. Therefore, H10 was supported.

Hypothesis 11: Positive emotion will be positively associated with behavioral intentions.

Hypothesis 11 postulating a positive relationship between positive emotion and behavioral intention was supported. The result showed a significant coefficient (β_{41} = .25, t = 5.50, p < .001). Participants who experienced more positive emotion had greater behavioral intentions than those who experienced less positive emotion.

Hypothesis 12: Perceived risk will be negatively associated with attitude toward a website.

Hypothesis 12 proposed that perceived risk will be negatively related to attitude toward a website. The result revealed a significant negative relationship (β_{32} = -.26, t = -6.80, p < .001), supporting H12. Participants who perceived more risk on a website had more negative attitude toward the website.

Hypothesis 13: Perceived risk will be negatively associated with behavioral intentions.

Hypothesis 13 predicted a negative association between perceived risk and behavioral intentions. The results revealed that perceived risk is significantly and negatively related to behavioral intention (β_{42} = -.09, t = -2.46, p < .05). Participants who perceived less risk had greater behavioral intentions than those who perceived more risk. Thus, H13 was supported.

Hypothesis 14: Attitude toward a website will be positively associated with behavioral intentions.

Hypothesis 14 proposed a positive association between attitude toward a website and behavioral intentions. The results revealed a significant positive relationship between attitude and behavioral intentions (β_{43} = .41, t = 9.10, p < .001), implying that the more favorable the attitude toward a website, the greater the behavioral intentions. Therefore,

H14 was supported. The results of hypothesized model of Part II can be seen in Figure 3.9 and Table 3.13.

Direct and Indirect Effects

Based on the hypothesized model (See Figure 3.9), it is possible to consider that elaboration of mental imagery affected perceived risk directly ($\gamma_{21} = .06$) but also affected it indirectly through positive emotion ($\gamma_{11}\beta_{21} = -.11$). Also, quality of mental imagery affected perceived risk directly ($\gamma_{22} = -.05$) and indirectly ($\gamma_{12}\beta_{21} = -.06$). As shown in Table 3.14, the direct effects from elaboration and quality of mental imagery to perceived risk were not statistically significant, but indirect effects through positive emotion were significant. However, even though indirect effects were significant, total effects of elaboration and quality on perceived risk were not significant. Table 3.14 provides indirect, direct, and total effects for perceived risk, attitude toward a website, and behavioral intentions.

Decomposition of effects also revealed direct and indirect effects from elaboration to attitude toward a website and from quality to attitude toward a website. The total effects of elaboration on attitude toward a website (.24) were calculated by the sum of the direct effect ($\gamma_{31} = .11$) and the indirect effects ($\gamma_{11}\beta_{31} + \gamma_{11}\beta_{21}\beta_{32} + \gamma_{21}\beta_{32} = .14$), and the total effects of quality on attitude toward a website (.28) were also estimated by summing the direct effect ($\gamma_{32} = .18$) and the indirect effects ($\gamma_{12}\beta_{31} + \gamma_{12}\beta_{21}\beta_{32} + \gamma_{22}\beta_{32} = .10$). Results showed that elaboration only affected attitude toward a website indirectly

whereas quality and positive emotion influenced attitude toward a website directly and indirectly.

Table 3.14. Decomposition of direct, indirect, and total effects for the hypothesized model

Dependent variable	Predictor variable	Indirect effect	Direct effect	Total effect
Perceived risk	Elaboration of mental imagery	-.11*	.06	-.04
	Quality of mental imagery	-.06*	-.05	-.11
	Positive emotion		-.26*	-.26*
Attitude toward a website	Elaboration of mental imagery	.14*	.11	.24*
	Quality of mental imagery	.10*	.18*	.28*
	Positive emotion	.07*	.30*	.37*
	Perceived risk		-.26*	-.26*
Behavioral intentions	Elaboration of mental imagery	.21*	.24*	.44*
	Quality of mental imagery	.18*	.11*	.29*
	Positive emotion	.17*	.25*	.42*
	Perceived risk	-.11*	-.09*	-.20*
	Attitude toward a website		.41*	.41*

Note. *$p < .05$

The model further revealed direct and indirect effects from elaboration to behavioral intentions and from quality to behavioral intentions. The total effects of elaboration on behavioral intentions (.44) consisted of the direct effect ($\gamma_{41} = .24$) and the indirect effects through positive emotion, perceived risk, and attitude toward a website ($\gamma_{11}\beta_{21}\beta_{32}\beta_{43} + \gamma_{11}\beta_{31}\beta_{43} + \gamma_{11}\beta_{21}\beta_{42} + \gamma_{21}\beta_{32}\beta_{43} + \gamma_{11}\beta_{41} + \gamma_{21}\beta_{42} + \gamma_{31}\beta_{43} = .21$). The strongest relationships of the indirect effects were elaboration – positive emotion – behavioral intentions ($\gamma_{11}\beta_{41} = .10$). In addition, total effects of quality on behavioral intentions (.29) were obtained by the sum of the direct effect ($\gamma_{42} = .11$) and indirect effects ($\gamma_{12}\beta_{21}\beta_{32}\beta_{43} + \gamma_{12}\beta_{31}\beta_{43} + \gamma_{12}\beta_{21}\beta_{42} + \gamma_{22}\beta_{32}\beta_{43} + \gamma_{12}\beta_{41} + \gamma_{22}\beta_{42} + \gamma_{32}\beta_{43} = .18$). The

strongest relationships of the indirect effect were quality – attitude toward a website – behavioral intentions ($\gamma_{32}\beta_{43} = .07$), followed by quality – positive emotion – behavioral intentions ($\gamma_{12}\beta_{41} = .06$).

Part III: Additional Analyses

The purpose of Part III was to investigate whether the structural relationships examined in Part II differ as a function of SOP. Multi-group SEM was conducted after constraining the regression coefficients of the path addressing hypotheses in Part II.

Firstly, a based model with two SOP groups with no constraints was tested and found to be a good fit based on the RMSEA and incremental fit indices ($\chi^2 = 328.03$, $df = 238$; RMSEA = .026; NFI = .96; IFI = .89; TLI = .84; CFI = .99). The next step was to assess invariance of latent factor loadings for both groups to investigate whether the measurement model was equally valid across the groups. The factor loadings were constrained to be equal across groups, and a chi-square difference test was used between the base model and the constrained model. Result showed that the two models were not significantly different ($\Delta\chi^2 = 12.15$, $\Delta df = 12$, $p > .25$), indicating the constrained model was superior, and all factor loadings were the same for both groups.

Since the constrained model of factor loadings was retained, invariance of path coefficients was tested using chi-square difference tests. For example, in order to examine the relationship between elaboration and positive emotion between SOP groups, all factor loadings and a path coefficient from elaboration to positive emotion were constrained to be equal across the groups (i.e., all factor loadings and γ_{11} in Group 1 = γ_{11}

in Group 2), and then this constrained model was compared to a constrained model of factor loadings. Table 3.15 shows results of a series of multi-group SEM. All relationships in Part II did not significantly differ depending on the SOP groups, implying that constrained models of all factor loadings and path coefficients were superior to the constrained model of factor loadings. Thus, it can be concluded that path coefficients are the same between verbalizers and visualizers.

Table 3.15. Multi-group analyses for the effects of SOP

Equality constraints	χ^2	*df*	$\Delta\chi^2$	Δdf	Sig.	Invariant
Base model (no constrains)	328.03	238				
Constrained model[1] (factor loadings)	340.17	250	12.15	12	ns	Yes
Constrained model[2] (factor loadings + path coefficients)						
FL + Elaboration → Positive emotion	340.33	251	.15	1	ns	Yes
FL + Quality → Positive emotion	341.39	251	1.22	1	ns	Yes
FL + Elaboration → Perceived risk	340.74	251	.56	1	ns	Yes
FL + Quality → Perceived risk	341.16	251	.99	1	ns	Yes
FL + Elaboration → Attitude toward a website	340.20	251	.02	1	ns	Yes
FL + Quality → Attitude toward a website	341.16	251	.98	1	ns	Yes
FL + Elaboration →Behavioral intention	340.24	251	.07	1	ns	Yes
FL + Quality → Behavioral intention	342.78	251	2.61	1	ns	Yes
FL + Positive emotion→ Perceived risk	340.42	251	.25	1	ns	Yes
FL + Positive emotion→ Attitude toward a website	340.24	251	.07	1	ns	Yes
FL + Positive emotion→ Behavioral intentions	340.20	251	.02	1	ns	Yes
FL + Perceived risk → Attitude toward a website	341.55	251	1.38	1	ns	Yes
FL + Perceived risk → Behavioral intentions	340.67	251	.20	1	ns	Yes
FL + Attitude toward a website → Behavioral intentions	340.18	251	.01	1	ns	Yes

Note. $\Delta\chi 2 = \chi 2$ (constrained model [2]) - $\chi 2$ (constrained model [1]); $\Delta df = df$ (constrained model [2]) – df (constrained model [1])

DISCUSSION AND CONCLUSION

Summary and Conclusion

Online shopping is growing very fast compared to other shopping channels. However, many consumers are still reluctant to purchase apparel online even though they use Internet almost every day. The main reason is the lack of direct product experience on the Internet. Therefore, many online retailers have tried and developed diverse product presentation techniques to enhance consumers' shopping outcomes. One of the techniques is to use visual and verbal information evoking mental imagery. Many researchers have studied mental imagery in advertising and tourism research, but effects of imagery-evoking product presentation in online shopping has not been studied yet.

The purposes of the present study were: (1) to examine effects of product presentation using visual and verbal information on consumers' mental imagery; (2) to investigate how mental imagery evoked from product presentation is related to consumers' other internal states (i.e., positive emotion, perceived risk, and attitude toward a website); (3) to explore the effects of product presentation on consumers' internal states and behavioral intention as a function of consumers' individual characteristic (SOP); and (4) to investigate relationships among consumers' internal states and behavioral intentions.

This research was guided by the environmental psychology model, stimulus – organism – response (SOR) model as a theoretical framework (Mehrabian & Russell,

1974). The SOR model posits that visual and verbal information (S) on websites influence shopping outcomes (R), and that consumers' affective and cognitive internal states (O) mediate the relationship between stimulus (S) and response (R). Also, dual coding theory provided the theoretical framework for the proposed model of the effect of visual and verbal information on mental imagery. The model in the study was examined by conducting an experiment using four different types of mock apparel websites.

The Effects of Visual and Verbal Information

The present study examined the effects of product presentation on consumers' responses to apparel online retailing. Two aspects of online product presentation examined in the study were visual and verbal product information evoking mental imagery. The results showed that when people were exposed to a product image with a concrete background, they experienced higher mental imagery than when people were exposed to a product image with a solid white background. The findings of the effects of visual and verbal information on mental imagery were partially supported. The results were consistent with previous studies (Babin & Burns, 1997; Burns et al., 1993; Walters et al., 2007) that investigated the effects of vivid visual information and the mediating role of mental imagery on recall, favorable attitudes, and decision making processes, and behavioral intentions in advertising research. On an apparel website, it was found that concrete visual information (i.e., a product image with a concrete and relevant background) facilitates the elaboration of mental imagery. In addition, elaboration of mental imagery evoked from visual product presentation may compensate for the

inability to try on the garment by imaging the consumption situation, thus increasing behavioral intentions.

This research contributes to online retailing by providing enhanced knowledge of mental imagery in an online shopping context. In particular, prior research used a mental imagery scale that focuses on mental representation of stimuli. However, the scale used on this research focuses on consumers' mental representation of product-related behaviors and outcomes of product use (Walkers & Olson, 1994). Therefore, the scale employed in the current study may be more appropriate to measure consumer behaviors in online retailing. As a result, the findings of the research provide additional empirical support for mental imagery in an online shopping context.

The present study did not support the effect of verbal information on mental imagery. This result can be explained by the picture superiority effect (Paivio, 2007) which holds that visual information is superior to verbal information. Therefore, visual information outperforms verbal information in affecting consumer responses (Rossiter, 1982). Furthermore, Kroeber-Riel (1984) found that most consumers paid attention to the dominant picture first in a print advertisement before they focused on verbal information. Research also found that larger pictures, colored pictures, and diverse-colored pictures made it easier to attract consumers' attention (Grønhaug, Kvitastein, Grønmo, 1991). In this study, compared to verbal descriptions of a product, the product image might have been more dominant, thus attracting participants to the product image first.

Individual Differences

Childers et al. (1985) argued that differences of individual's information processing derive from preferred approach of processing styles, such as visual and verbal and individual encoding ability. The results revealed that there were moderating effects for SOP on the relationship between visual information and mental imagery. Visualizers (high SOP group) experienced greater elaboration of mental imagery than verbalizers (low SOP group) when they were exposed to a product image with a concrete background. The result is congruent with Rossister and Percy's (1978) study. The researchers found a positive relationship between visualizers and image-oriented print ads. In particular, pictures in advertisements can stimulate mental imagery, and the effect of pictures is different in terms of SOP.

Further investigations into the moderating effects of SOP revealed that interaction effects of visual information by verbal information were different as a function of SOP. Contrary to the result of insignificant interaction effects on mental imagery, when an individual's different information processing styles were considered, the interaction effects were significantly different between visualizers and verbalizers. For example, when visualizers were exposed to a product image with a concrete background, the presence of concrete verbal descriptions related to a consumption situation significantly increased elaboration of mental imagery. In other words, visualizers are influenced not only by concrete visual information but also by concrete verbal information by elaborating mental representation of the concrete verbal information in their minds. However, when visualizers were exposed to a product image with a solid white

background, the effects of concrete descriptions did not differ, suggesting that people tend to be influenced by visual information first (Kroeber-Riel, 1984; Paivio, 2007).

Furthermore, when verbalizers were exposed to a product image with a solid white background, presence of concrete verbal descriptions generated greater elaboration of mental imagery than absence of concrete descriptions. However, the product image with a concrete background did not influence verbalizers regardless of the presence or absence of concrete descriptions. Verbalizers are more likely to be positively affected by a solid white background especially when there are concrete verbal descriptions. This result is somewhat inconsistent with past research. According to Burns et al. (1993), visualizers also tend to evoke elaborate mental imagery when they are exposed to verbal descriptions. This finding may be more related to individual's cognitive ability of information processing than to the individual's preference of information processing (Childers et al., 1985). In other words, verbalizers might be influenced by the concrete verbal descriptions based on their encoding ability of verbal information and not influenced by the mental representation of the verbal description.

The Relationships among Consumers' Internal States and Shopping Responses

Structural equation modeling was used to examine Part II of the proposed model. The findings support the finding that elaboration and quality of mental imagery evoked from product presentation positively influenced positive emotion, attitude toward a website, and behavioral intentions. These findings are supported by prior research examining the effect of mental imagery on consumer behaviors. Mental imagery is

related to mental representation of emotions or ideas in the individual's memory (MacInnis & Price, 1987). Lang (1979) also stated that personal memories are emotional experiences. In this study, summer t-shirts and pants were presented on a vacation scene with verbal descriptions of a beach. Therefore, product presentation used in the research might stimulate people's long-term memory related to their vacation on a beach, which in turn elicited positive emotion.

A relationship between mental imagery and attitude and behavioral intentions has been discussed in much advertising research and the results are congruent with Babin and Burns' study (1997). People who experienced greater mental imagery had more favorable attitude toward a website and greater behavioral intentions than those who did not experience mental imagery.

However, mental imagery did not influence perceived risk. According to Peck and Childers (2003), mental imagery generated from visual and verbal information for product textures facilitate haptic information acquisition and then lower perceived risk. Therefore, the proposed model predicted that mental representation of consumption situations may also reduce perceived risk. It may be possible to conclude that it is mental imagery related to the product itself rather than consumption situations that influences perceived risk. Further research is needed for understanding how mental imagery influences perceived risk. Further investigation about the direct and indirect effects also revealed that mental imagery did not directly affect perceived risk, but influenced the perceived risk indirectly through positive emotion. Therefore, it can be concluded that

successful evocation of mental imagery may be helpful in reducing perceived risk, depending on consumers' emotional states.

The results from the hypothesized model also support negative effect of positive emotion on perceived risk and positive effects of positive emotion on attitude toward a website and behavioral intention. The results are consistent with past research (Babin et al., 1992; Chaudhuri, 2002; Lee & Throson, 2009; Leiserowitz, 2006). People who felt more positive emotion from imagery-evoking product presentation perceived less risk and had more favorable attitude toward a website and greater behavioral intentions than people who had less positive emotion.

The findings further revealed that perceived risk negatively influenced attitude toward a website and behavioral intentions. Also, attitude toward a website positively influenced behavioral intentions. The results are congruent with prior research (Ajzen & Fishbein, 1980; Chen et al., 2002; Heijden et al., 2003; Jarvenpaa et al., 2000; Park et al., 2005). Further investigation into the indirect effect of perceived risk on behavioral intention was conducted. The results revealed that attitude toward a website mediated the relationship between perceived risk and behavioral intentions. Perceived risk showed stronger indirect effect on behavioral intentions rather than an indirect effect through attitude toward a website.

Implications

Theoretical Implications

Online shopping has grown rapidly during the past 10 years, and apparel has been one of the top product categories for the past several years. However, despite its growing popularity among general public, consumers' attitudes toward online shopping for apparel tend to be more negative compared to their attitudes toward other consumer products that do not require sensory evaluations (Shim, Eastlick, Lotz, & Warrington, 2001). In this light, online retailers have developed diverse technology enhancing realistic sensory experiences and effective visual merchandising techniques to compensate for a consumer need for direct experience of apparel product (Khakimdjanova & Park, 2005; Shim et al., 2001). Although past studies have examined many different product presentation technologies, there has been little research investigating an imagery-evoking product presentation technique. This study empirically showed that clothes presented in a consumption situation (background image) evoke mental imagery related to the future consumption experiences, which in turn influence positive emotion, attitude toward a website and behavioral intentions. Therefore, it is important to pay attention to the product presentation stimulating mental imagery because elaboration of mental imagery was associated directly and indirectly with behavioral intentions.

The study also provides empirical support for the style of processing (SOP) (Childers et al., 1985). The SOP moderated a relationship between visual information and

mental imagery and a relationship between visual information by verbal information and mental imagery. Although the SOP did not interact with verbal information, it would be important to note that concrete verbal descriptions of a consumption situation influence mental imagery when visualizers are exposed to a product image with a concrete background and when verbalizers are exposed to a product image with a solid white background. Thus, the current research provided additional empirical evidence of the effect of SOP in an online shopping context.

Dual coding theory provided the theoretical framework for the proposed model of the effect of visual and verbal information on consumers' responses. The theory postulates that visual and verbal information are independent and interconnected when activated (Paivio, 2007). The theory also posits the picture superiority effect, which holds that visual information is superior to verbal information, thus being more easily processed by people. Even though the effects of verbal information and the interaction effects of visual by verbal information were not significant, the effects of visual and verbal information on mental imagery were different depending on an individual's information processing styles (SOP). Therefore, the dual coding theory was supported.

This study successfully applied the process of mental imagery to the SOR model. According to the SOR model, environmental stimuli (S) influence consumers' behavioral responses (R) and consumers' affective and cognitive states mediate the relationship between environmental stimuli (S) and responses (R) (Mehrabian & Russell, 1974). In the present study, product presentation (S) influenced consumers' behavioral intentions (R) through cognitive and affective states (O). Mental imagery perfectly mediated the

relationship between product presentation and other consumer responses. Furthermore, decomposition of effects revealed that positive emotion, perceived risk, and attitude toward a website mediated a relationship between mental imagery evoked by product presentation and behavioral intentions.

Managerial Implications

The findings of this study provide useful insights that apparel online retailers can utilize to develop more effective online retailing websites. Due to the intangible nature of online shopping for apparel, many people are still reluctant to purchase apparel online even though they browse apparel online very frequently. In nonstore retailing, visual and verbal product presentation evoking mental imagery is a possible way to compensate for the disadvantage of online shopping.

The findings of the study suggest to online apparel retailers the importance of imagery-evoking product presentation. A product image with a concrete background was more effective than a product image with a solid white background in influencing consumers' mental imagery. For example, by presenting a dress in a situational background, consumers can imagine how the dress can be worn in a certain situation. In particular, if consumers shop apparel for unusual occasions, such as a vacation, a formal meeting, or a party, they can get more useful information from the relevant background image. Therefore, by facilitating elaboration of mental imagery from product presentation, online retailers can compensate for the inability to try on the garment since consumers can imagine the consumption situation, thus increasing behavioral intentions.

Based on an individual's style of information processing, the effects of product presentation differed. In this study, visualizers tended to elaborate mental imagery when they were exposed to a concrete background. In addition, if there are concrete verbal descriptions evoking mental imagery, the effect was further enhanced. Therefore, even if the effect of verbal information on mental imagery was not significant, if online retailers present concrete verbal information describing a consumption situation, it may help consumers' acquisition of product information.

In addition, based on the mediating roles of consumers' internal states, such as positive emotions, perceived risk, and attitude toward a website, on purchase intentions, online retailers need to make sure that their websites are pleasing to their target customers.

The role of visual information in terms of evoking imagery has been discussed in advertising and tourism research (Babin & Burns, 1997; Childers & Houston, 1982; Walters et al., 2007). However, by providing empirical support for mental imagery in an online context, this research has not only contributed to the academic aspects of consumer behaviors, it has also filled a specific knowledge gap that existed within product presentation literature. Therefore, the findings can assist online retailers in better understanding how consumers process visual and verbal information, thus developing effective apparel websites aimed at their target customers.

Limitation and Future Research

This study entails several limitations. This study focused on female college students' responses to online product presentation. While this group comprises a major portion of online shoppers for apparel, they may not be representative of all shoppers. Thus future research needs to include more diverse group of Internet shoppers for greater generalizability of the findings.

Another limitation is the type of product studied. The findings of the study are specific to online apparel shopping although similar product presentation techniques are expected to be useful for selling other types of product online.

The effect of verbal information on mental imagery was not significant. A manipulation check of the verbal information revealed that the presence and absence of verbal information evoking mental imagery were not significantly different. A possible reason for the insignificant result may be that mental imagery scales employed in a pretest and the main experiment were different. In the main experiment, a scale measuring mental imagery which is closer to consumption vision was used, while a different mental imagery scale was used in the pretest because consumption vision cannot be asked to participants without a product sold on a website. Therefore, it would be worthwhile to conduct future research by manipulating imagery-evoking verbal information or by using the same scale in both pretest and main experiment.

Future research needs to investigate other product presentation techniques from a mental imagery perspective. This study used mental imagery to help consumers imagine

consumption behaviors. However, without using background images, consumers may experience mental imagery from the product itself. For example, when many product items are coordinated together (e.g., t-shirt, shirt, shoes, bag, and other accessories together in a model), consumers may represent more images in their minds than when only one item (e.g., t-shirt) is presented. Also, on the same product page, if an additional way of product coordination is presented using the same t-shirt (e.g., t-shirt, pants, different shoes and bag, and different accessories), consumers may experience greater mental imagery and may perceive a larger amount of information than when one way of product coordination is presented. Currently, there are only a few website presenting different ways of product coordination. Therefore, it would be meaningful to study for online retailers.

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CHAPTER 4

CONCLUSION

The primary goal of this research was to provide practical guidelines based on empirical evidence for effective website design, including both a home page and a product page. In order to move toward the primary goal, this research consists of two consecutive empirical studies.

A number of studies have examined website design issues. According to past research, visual images play an important role in creating positive impressions about retailers (Tractinsky & Lowengart, 2007). In an online retailing context, a home page is likely to play a key role in creating the first impression of an online retailer. Yet, little scholarly attention has been given to web home pages. Therefore, to fill this research gap, the first study focused on the effects of home page design on consumer responses.

The findings showed that consumers are influenced by image-oriented home pages. Compared to text-oriented home pages, image-oriented home pages made consumers like the website better and finally drew more consumers to product pages. In this regard, an online home page plays a similar role to advertising in that a home page attracts consumers, carries retailers' images to consumers, and brings into notice of current fashion trends. In particular, when a brand name on a home page is unfamiliar to consumers, image-oriented home pages were more effective in influencing consumers in terms of perceived aesthetics. In addition to advertising, an online home page can be

compared to a window display in traditional retail stores. Similar to consumers in traditional retail stores viewing a window display, online shoppers view a home page of a website, form certain impressions about the online store from the home page, and then depending on the impressions, they explore the product pages and revisit the website. Therefore, by presenting an image-oriented home page, online retailers can convey positive impressions about their websites, thus increasing consumers' intention to browse products more and intention to revisit the websites.

Even when consumers formed favorable impressions of a home page and entered product pages, if product displays are not satisfactory, consumers may switch to other retail websites to shop. Due to the inability to physically evaluate a product prior to purchase, online shoppers have to depend on product presentation created by online retailers to make a purchase decision instead of actively seeking out information as they would at a brick-and-mortar store. Therefore, it is important for online retailers to develop effective online product presentation that successfully facilitates online shoppers' product evaluation in a virtual online world. In this regard, the purpose of the second study was to examine the effects of product presentation of product pages on consumer responses.

Once consumers explore product pages, having pages that improve consumers' behavioral intentions is essential. Thus, it was important to examine consumer responses based on different product presentation strategies, such as imagery-evoking product presentations. Even though online websites play a similar role to advertising (Singh & Dalal, 1999), popular topics in advertising, such as mental imagery on consumer

behaviors play a minimal role in an online context. In particular, mental imagery has been considered as an effective strategy for the intangible or experiential shopping (Schwarz, 1986). Therefore, this study applied mental imagery to an online shopping context and examined the effects of imagery-evoking product presentation on consumer responses.

The findings of the research provided practical implications for online retailers to develop effective product presentation. Consumers were found to elaborate mental imagery when a product was displayed on a concrete background. This finding suggests that online retailers need to find a presentation strategy to evoke mental imagery while presenting products. For example, they can present a t-shirt against the background of a vacation scene rather than presenting a t-shirt on a solid white background. By using such a strategy, consumers can easily imagine their consumption behaviors and situations. Also, consumers' elaboration of mental imagery influenced consumers' emotions, perceived risk, attitude toward a website, and behavioral intentions. Therefore, using imagery-evoking product presentation, online retailers can expect consumers' other desired behaviors.

Although this study did not support effects of concrete verbal descriptions on mental imagery evocation, when concrete verbal descriptions were presented with concrete background images to visualizers, they experienced greater mental imagery than when only concrete background images were displayed on product pages. Thus, online retailers also need to present verbal descriptions evoking mental imagery as well as concrete backgrounds.

Overall, this research contributed to the literature in online retailing, marketing

and textiles and clothing areas. First of all, the roles of visual appeal in home pages have been emphasized in prior research (Lindgaard et al., 2006; Park et al., 2005), but not in websites for apparel shopping. This study provides empirical evidence of roles of visual elements in home pages. Based on the findings of this study, one way to create effective home pages for consumers is developing an image-oriented home page. Instead of cluttering a home page with a significant amount of text, the page should utilize visual components that represent a brand image and thus increase visual fluency and perceived aesthetics. By doing so, online retailers also can enhance consumers' behavioral intentions.

Second, this study applied mental imagery to an online shopping context. Effects of concrete visual and verbal information on mental imagery were investigated in much advertising and tourism research (Babin & Burns, 1997; Miller & Stoica, 2003) and also found to influence consumers' positive attitudes toward a brand and behavioral intentions. Similarly, this study suggests that using concrete and relevant backgrounds when displaying products in apparel websites enhances consumers' mental imagery, which in turn influences positive emotions, positive attitudes toward a website, and behavioral intentions. There are currently few apparel websites presenting concrete backgrounds with their products. Therefore, the findings of this study may help online apparel retailers develop their websites more effectively and increase consumers' behavioral intentions.

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APPENDICES

APPENDIX A

PRETESTS
INVITATION MAIL AND INFORMED CONSENT FORM

Dear Participant:

You are being invited to participate in a study of online shopping. Please respond to this brief survey. Your participation is completely voluntary.

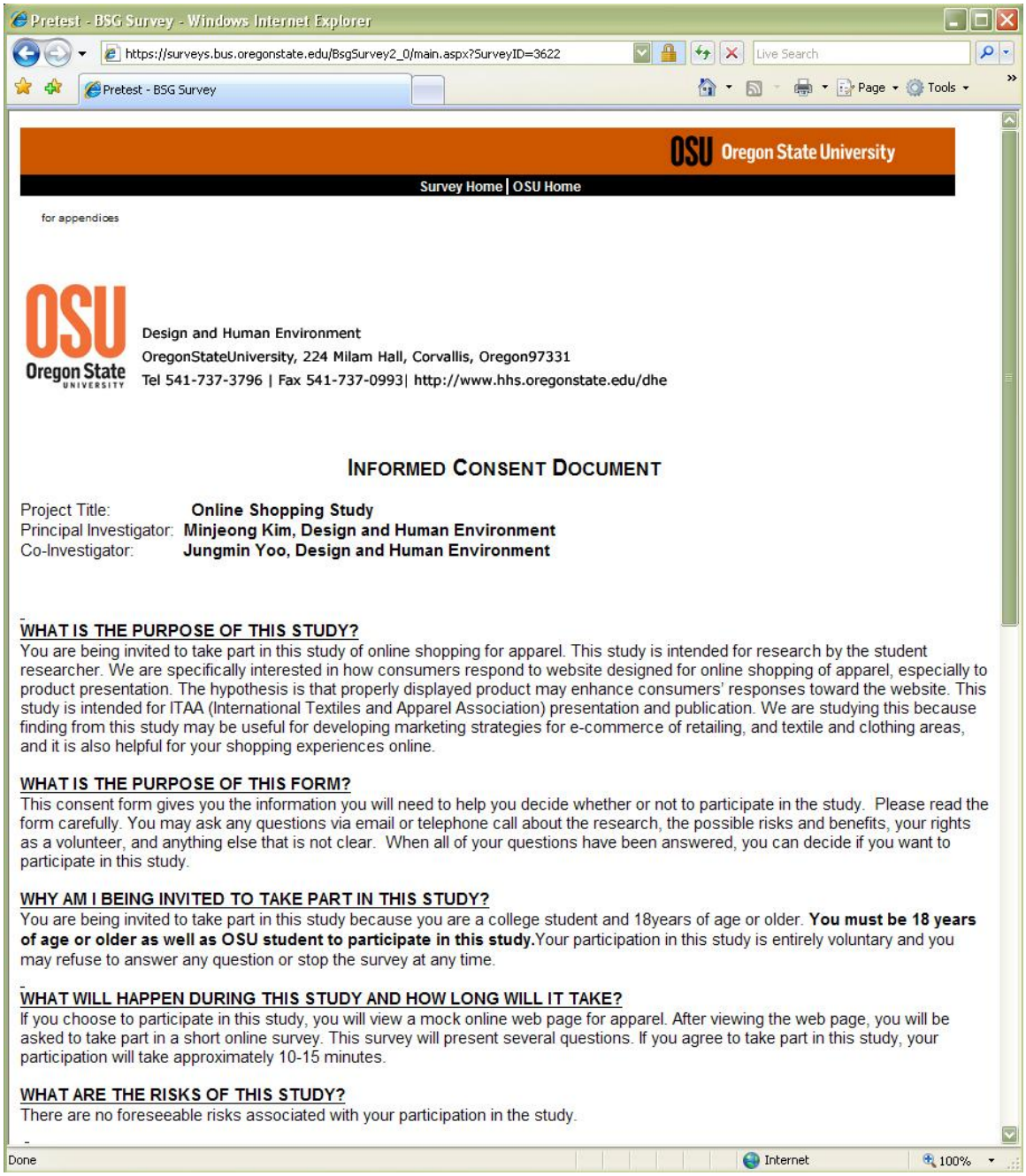
The purpose of this study is to investigate consumers' online shopping behaviors. This study should take approximately 5-10 minutes. This study is concerned with aggregate data and not with your individual responses. Thus, your responses will remain confidential. Your name will not be associated with the data collected. If you do not wish to answer questions, you can refuse to answer them or you can refuse to participate without penalty or repercussion.

You will get extra credits for the participation in this study.

Please, click on the following link to take the survey:
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622

Your cooperation and participation in this study are appreciated. If you have any questions or are interested in the results of the study, please contact Jungmin Yoo at yooju@onid.orst.edu.

Sincerely,
Jungmin Yoo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Survey Home | OSU Home
for appendices
Design and Human Environment
OregonStateUniversity, 224 Milam Hall, Corvallis, Oregon97331
Tel 541-737-3796 | Fax 541-737-0993| http://www.hhs.oregonstate.edu/dhe
INFORMED CONSENT DOCUMENT
Project Title: Online Shopping Study
Principal Investigator: Minjeong Kim, Design and Human Environment
Co-Investigator: Jungmin Yoo, Design and Human Environment
WHAT IS THE PURPOSE OF THIS STUDY?
You are being invited to take part in this study of online shopping for apparel. This study is intended for research by the student researcher. We are specifically interested in how consumers respond to website designed for online shopping of apparel, especially to product presentation. The hypothesis is that properly displayed product may enhance consumers' responses toward the website. This study is intended for ITAA (International Textiles and Apparel Association) presentation and publication. We are studying this because finding from this study may be useful for developing marketing strategies for e-commerce of retailing, and textile and clothing areas, and it is also helpful for your shopping experiences online.
WHAT IS THE PURPOSE OF THIS FORM?
This consent form gives you the information you will need to help you decide whether or not to participate in the study. Please read the form carefully. You may ask any questions via email or telephone call about the research, the possible risks and benefits, your rights as a volunteer, and anything else that is not clear. When all of your questions have been answered, you can decide if you want to participate in this study.
WHY AM I BEING INVITED TO TAKE PART IN THIS STUDY?
You are being invited to take part in this study because you are a college student and 18years of age or older. You must be 18 years of age or older as well as OSU student to participate in this study.Your participation in this study is entirely voluntary and you may refuse to answer any question or stop the survey at any time.
WHAT WILL HAPPEN DURING THIS STUDY AND HOW LONG WILL IT TAKE?
If you choose to participate in this study, you will view a mock online web page for apparel. After viewing the web page, you will be asked to take part in a short online survey. This survey will present several questions. If you agree to take part in this study, your participation will take approximately 10-15 minutes.
WHAT ARE THE RISKS OF THIS STUDY?
There are no foreseeable risks associated with your participation in the study.
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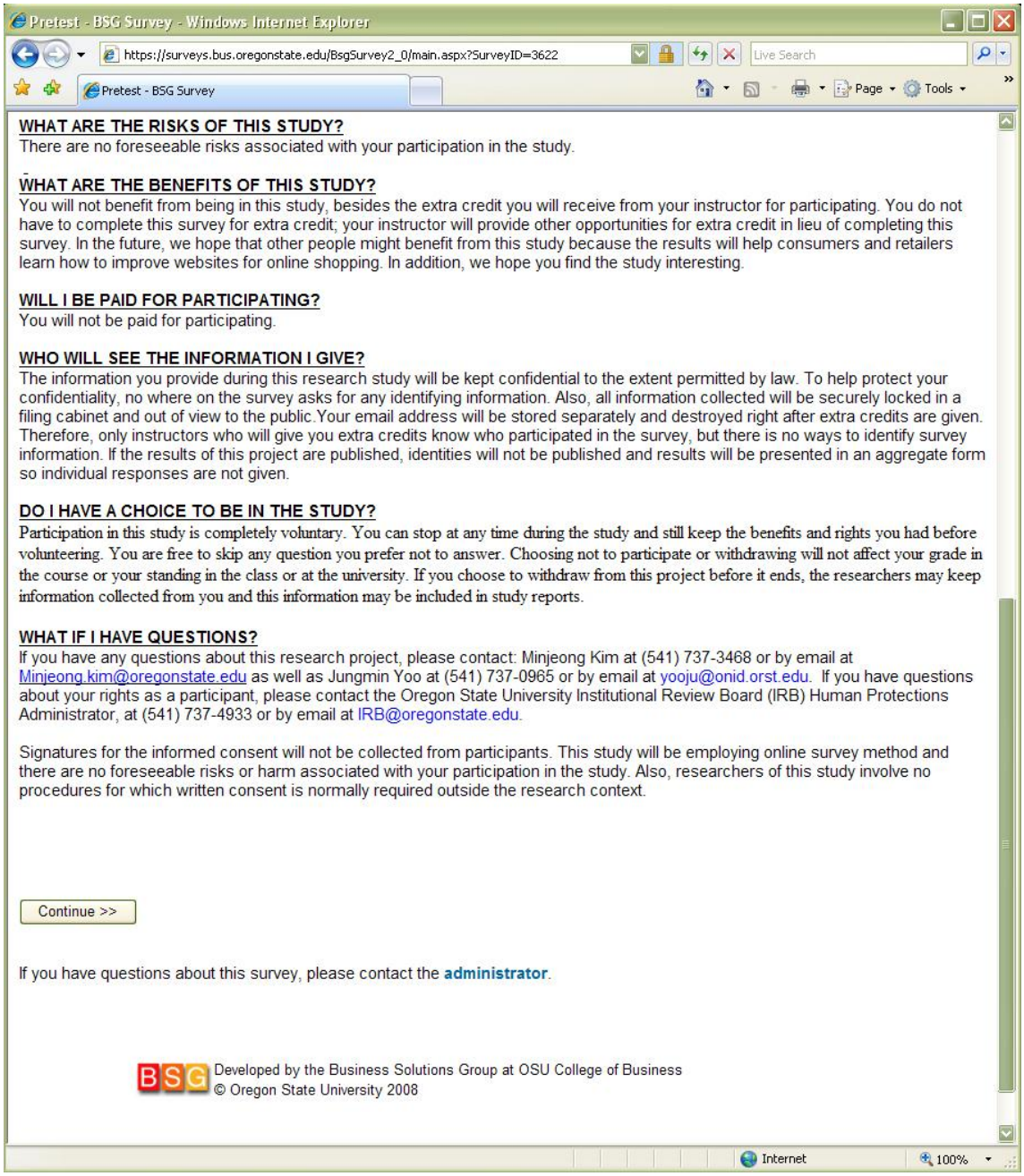
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WHAT ARE THE RISKS OF THIS STUDY?
There are no foreseeable risks associated with your participation in the study.
WHAT ARE THE BENEFITS OF THIS STUDY?
You will not benefit from being in this study, besides the extra credit you will receive from your instructor for participating. You do not have to complete this survey for extra credit; your instructor will provide other opportunities for extra credit in lieu of completing this survey. In the future, we hope that other people might benefit from this study because the results will help consumers and retailers learn how to improve websites for online shopping. In addition, we hope you find the study interesting.
WILL I BE PAID FOR PARTICIPATING?
You will not be paid for participating.
WHO WILL SEE THE INFORMATION I GIVE?
The information you provide during this research study will be kept confidential to the extent permitted by law. To help protect your confidentiality, no where on the survey asks for any identifying information. Also, all information collected will be securely locked in a filing cabinet and out of view to the public.Your email address will be stored separately and destroyed right after extra credits are given. Therefore, only instructors who will give you extra credits know who participated in the survey, but there is no ways to identify survey information. If the results of this project are published, identities will not be published and results will be presented in an aggregate form so individual responses are not given.
DO I HAVE A CHOICE TO BE IN THE STUDY?
Participation in this study is completely voluntary. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. You are free to skip any question you prefer not to answer. Choosing not to participate or withdrawing will not affect your grade in the course or your standing in the class or at the university. If you choose to withdraw from this project before it ends, the researchers may keep information collected from you and this information may be included in study reports.
WHAT IF I HAVE QUESTIONS?
If you have any questions about this research project, please contact: Minjeong Kim at (541) 737-3468 or by email at Minjeong.kim@oregonstate.edu as well as Jungmin Yoo at (541) 737-0965 or by email at yooju@onid.orst.edu. If you have questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-4933 or by email at IRB@oregonstate.edu.
Signatures for the informed consent will not be collected from participants. This study will be employing online survey method and there are no foreseeable risks or harm associated with your participation in the study. Also, researchers of this study involve no procedures for which written consent is normally required outside the research context.
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If you have questions about this survey, please contact the administrator.
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APPENDIX B

MAIN STUDIES
INVITATION MAIL AND INFORMED CONSENT FORM

Dear Participant:

You are being invited to participate in a study of online shopping. Please respond to this brief survey. Your participation is completely voluntary.

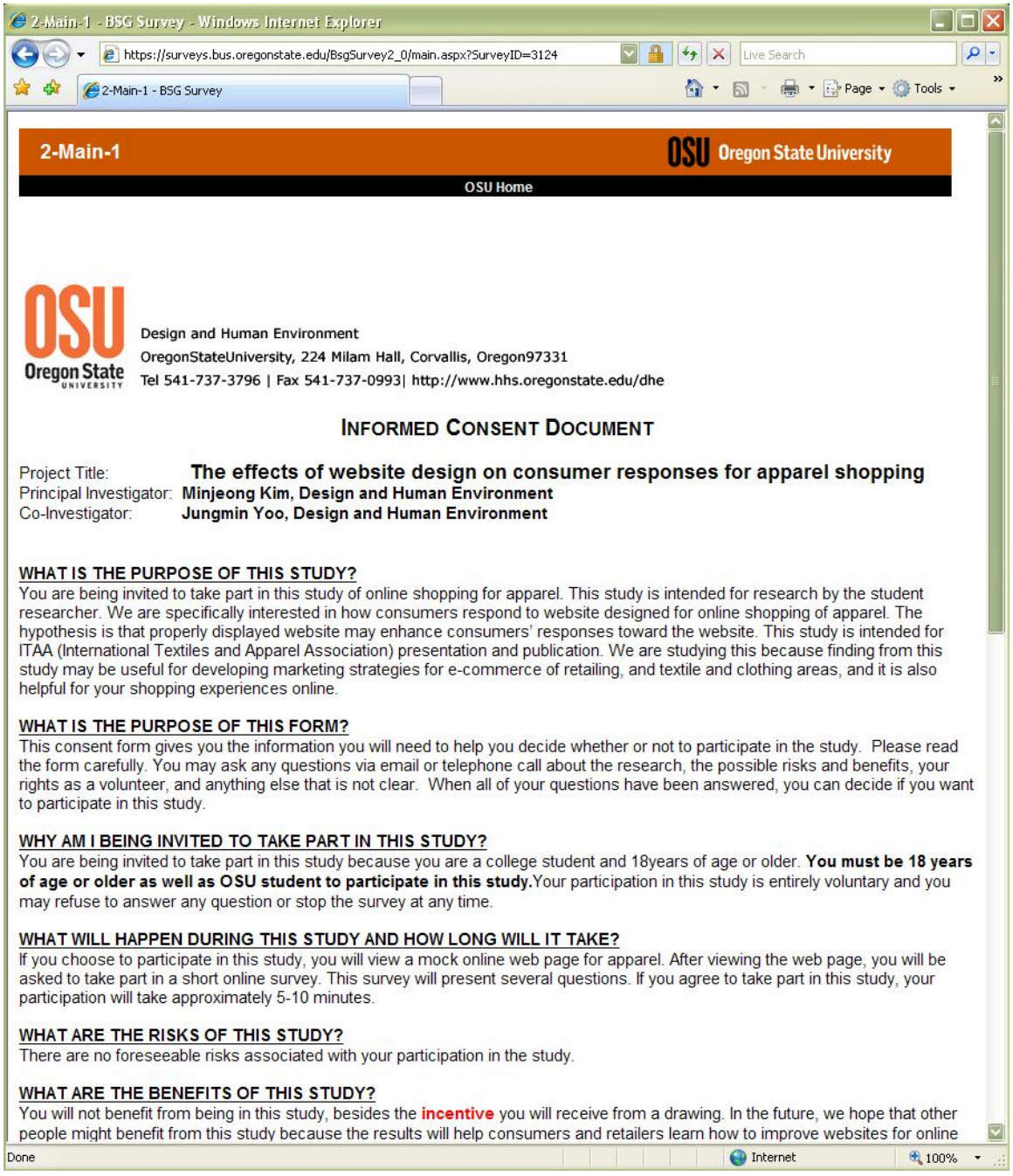
The purpose of this study is to investigate effects of website design for apparel shopping and to understand consumer behaviors. This study should take approximately 10-15 minutes. This study is concerned with aggregate data and not with your individual responses. Thus, your responses will remain confidential. Your name will not be associated with the data collected. If you do not wish to answer questions, you can refuse to answer them or you can refuse to participate without penalty or repercussion.

As an incentive for the participation in this survey, I will give all students who fill out the survey a chance to win a drawing for a **cash award of 100 $ or a gift card (worth 100$)** of a selected retailer.

Please, click on the following link to take the survey:
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3092

Your cooperation and participation in this study are appreciated. If you have any questions or are interested in the results of the study, please contact Jungmin Yoo at yooju@onid.orst.edu.

Sincerely,
Jungmin Yoo



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OSU Oregon State University

OSU Home

Design and Human Environment
OregonStateUniversity, 224 Milam Hall, Corvallis, Oregon97331
Tel 541-737-3796 | Fax 541-737-0993| http://www.hhs.oregonstate.edu/dhe

INFORMED CONSENT DOCUMENT

Project Title: **The effects of website design on consumer responses for apparel shopping**
Principal Investigator: **Minjeong Kim, Design and Human Environment**
Co-Investigator: **Jungmin Yoo, Design and Human Environment**

WHAT IS THE PURPOSE OF THIS STUDY?
You are being invited to take part in this study of online shopping for apparel. This study is intended for research by the student researcher. We are specifically interested in how consumers respond to website designed for online shopping of apparel. The hypothesis is that properly displayed website may enhance consumers' responses toward the website. This study is intended for ITAA (International Textiles and Apparel Association) presentation and publication. We are studying this because finding from this study may be useful for developing marketing strategies for e-commerce of retailing, and textile and clothing areas, and it is also helpful for your shopping experiences online.

WHAT IS THE PURPOSE OF THIS FORM?
This consent form gives you the information you will need to help you decide whether or not to participate in the study. Please read the form carefully. You may ask any questions via email or telephone call about the research, the possible risks and benefits, your rights as a volunteer, and anything else that is not clear. When all of your questions have been answered, you can decide if you want to participate in this study.

WHY AM I BEING INVITED TO TAKE PART IN THIS STUDY?
You are being invited to take part in this study because you are a college student and 18years of age or older. **You must be 18 years of age or older as well as OSU student to participate in this study.**Your participation in this study is entirely voluntary and you may refuse to answer any question or stop the survey at any time.

WHAT WILL HAPPEN DURING THIS STUDY AND HOW LONG WILL IT TAKE?
If you choose to participate in this study, you will view a mock online web page for apparel. After viewing the web page, you will be asked to take part in a short online survey. This survey will present several questions. If you agree to take part in this study, your participation will take approximately 5-10 minutes.

WHAT ARE THE RISKS OF THIS STUDY?
There are no foreseeable risks associated with your participation in the study.

WHAT ARE THE BENEFITS OF THIS STUDY?
You will not benefit from being in this study, besides the **incentive** you will receive from a drawing. In the future, we hope that other people might benefit from this study because the results will help consumers and retailers learn how to improve websites for online

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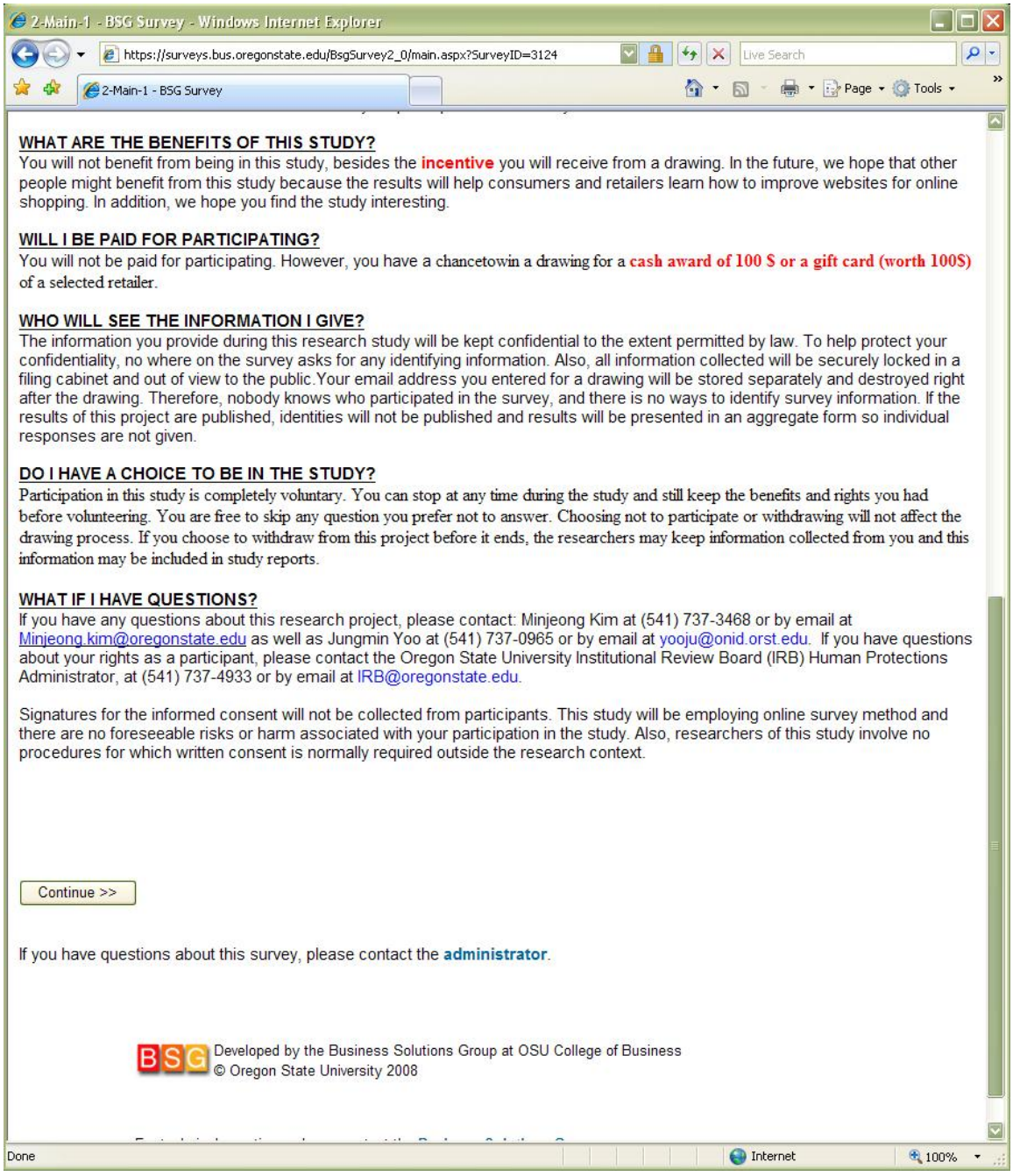
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WHAT ARE THE BENEFITS OF THIS STUDY?
You will not benefit from being in this study, besides the incentive you will receive from a drawing. In the future, we hope that other people might benefit from this study because the results will help consumers and retailers learn how to improve websites for online shopping. In addition, we hope you find the study interesting.
WILL I BE PAID FOR PARTICIPATING?
You will not be paid for participating. However, you have a chancetowin a drawing for a cash award of 100 $ or a gift card (worth 100$) of a selected retailer.
WHO WILL SEE THE INFORMATION I GIVE?
The information you provide during this research study will be kept confidential to the extent permitted by law. To help protect your confidentiality, no where on the survey asks for any identifying information. Also, all information collected will be securely locked in a filing cabinet and out of view to the public.Your email address you entered for a drawing will be stored separately and destroyed right after the drawing. Therefore, nobody knows who participated in the survey, and there is no ways to identify survey information. If the results of this project are published, identities will not be published and results will be presented in an aggregate form so individual responses are not given.
DO I HAVE A CHOICE TO BE IN THE STUDY?
Participation in this study is completely voluntary. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. You are free to skip any question you prefer not to answer. Choosing not to participate or withdrawing will not affect the drawing process. If you choose to withdraw from this project before it ends, the researchers may keep information collected from you and this information may be included in study reports.
WHAT IF I HAVE QUESTIONS?
If you have any questions about this research project, please contact: Minjeong Kim at (541) 737-3468 or by email at Minjeong.kim@oregonstate.edu as well as Jungmin Yoo at (541) 737-0965 or by email at yooju@onid.orst.edu. If you have questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-4933 or by email at IRB@oregonstate.edu.
Signatures for the informed consent will not be collected from participants. This study will be employing online survey method and there are no foreseeable risks or harm associated with your participation in the study. Also, researchers of this study involve no procedures for which written consent is normally required outside the research context.
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If you have questions about this survey, please contact the administrator.
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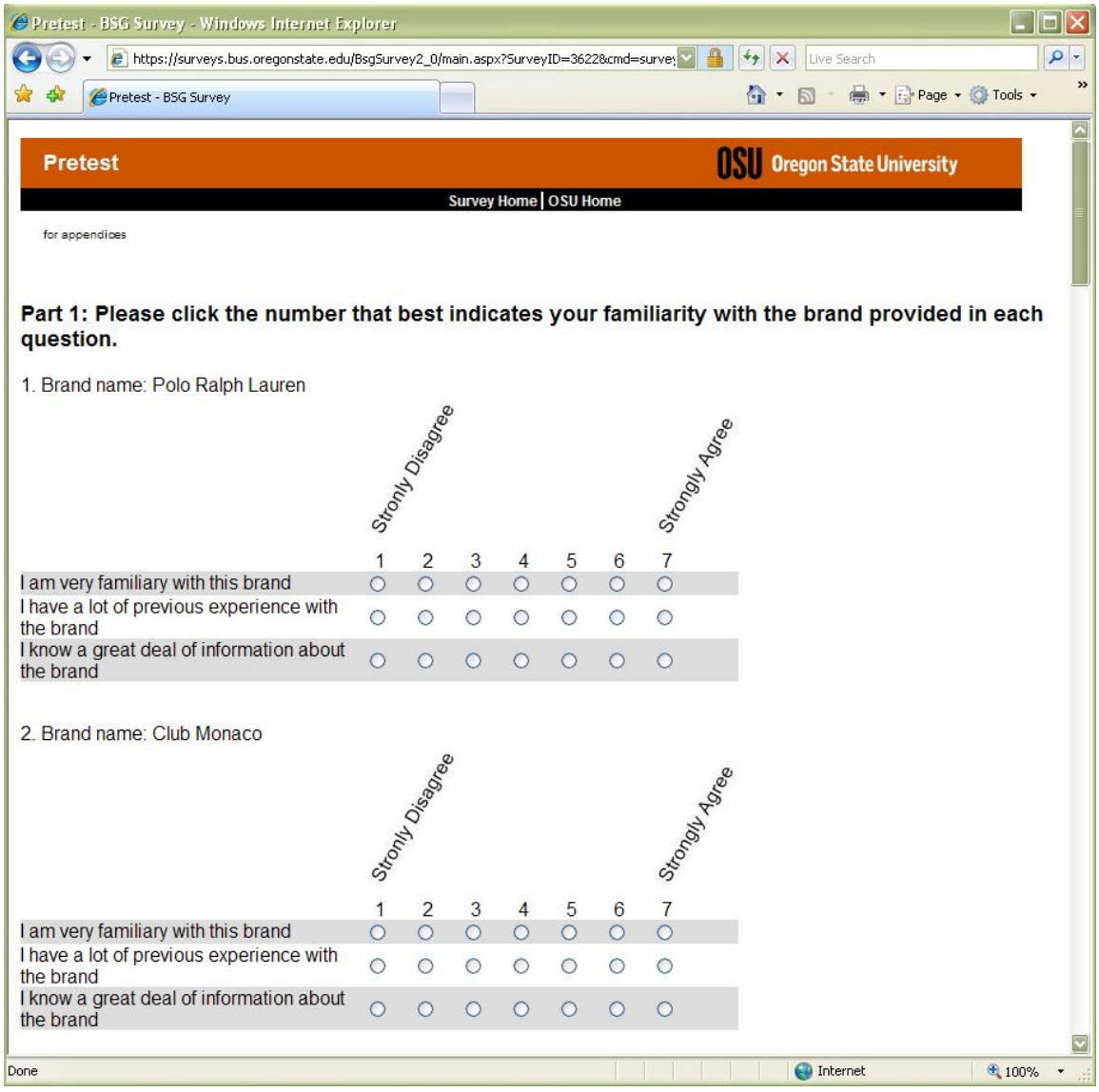
APPENDIX C

STUDY 1: PRETEST
BRAND FAMILIARITY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for appendices
Part 1: Please click the number that best indicates your familiarity with the brand provided in each question.
1. Brand name: Polo Ralph Lauren
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
2. Brand name: Club Monaco
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
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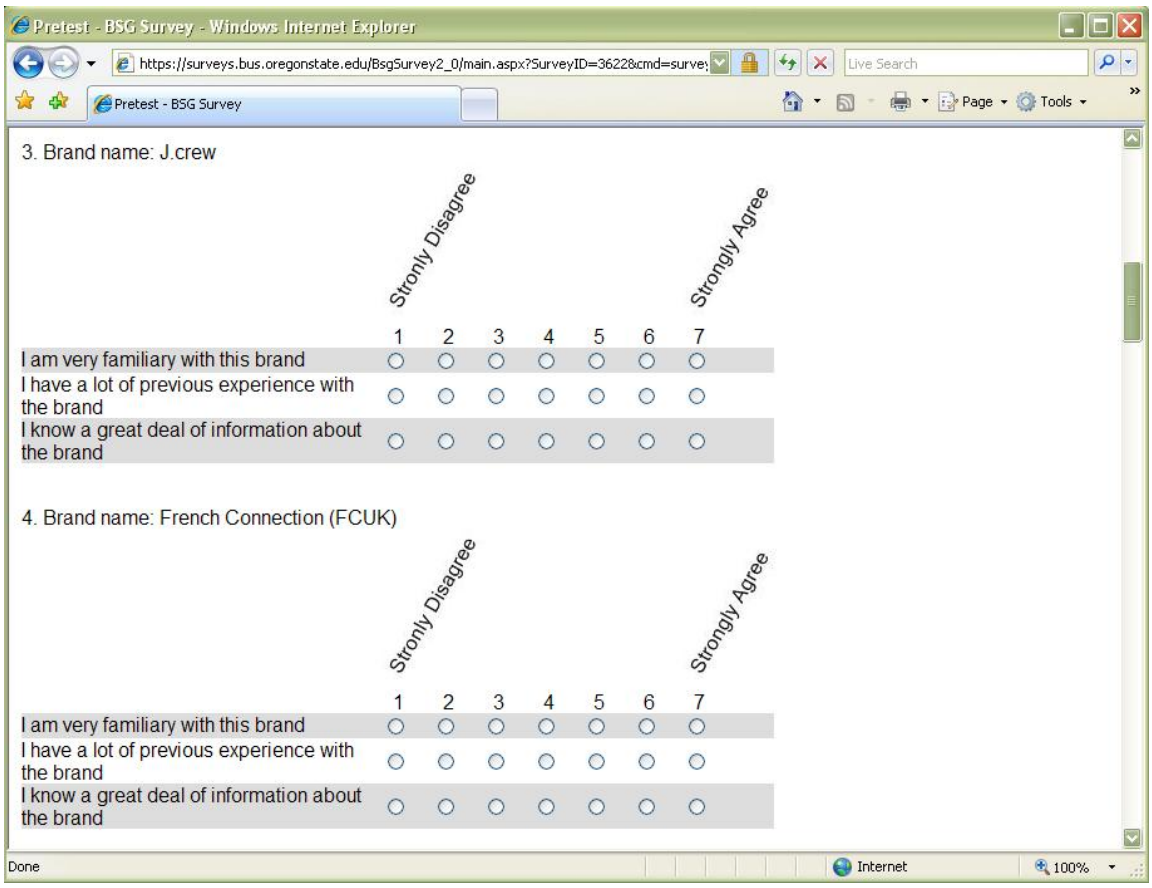
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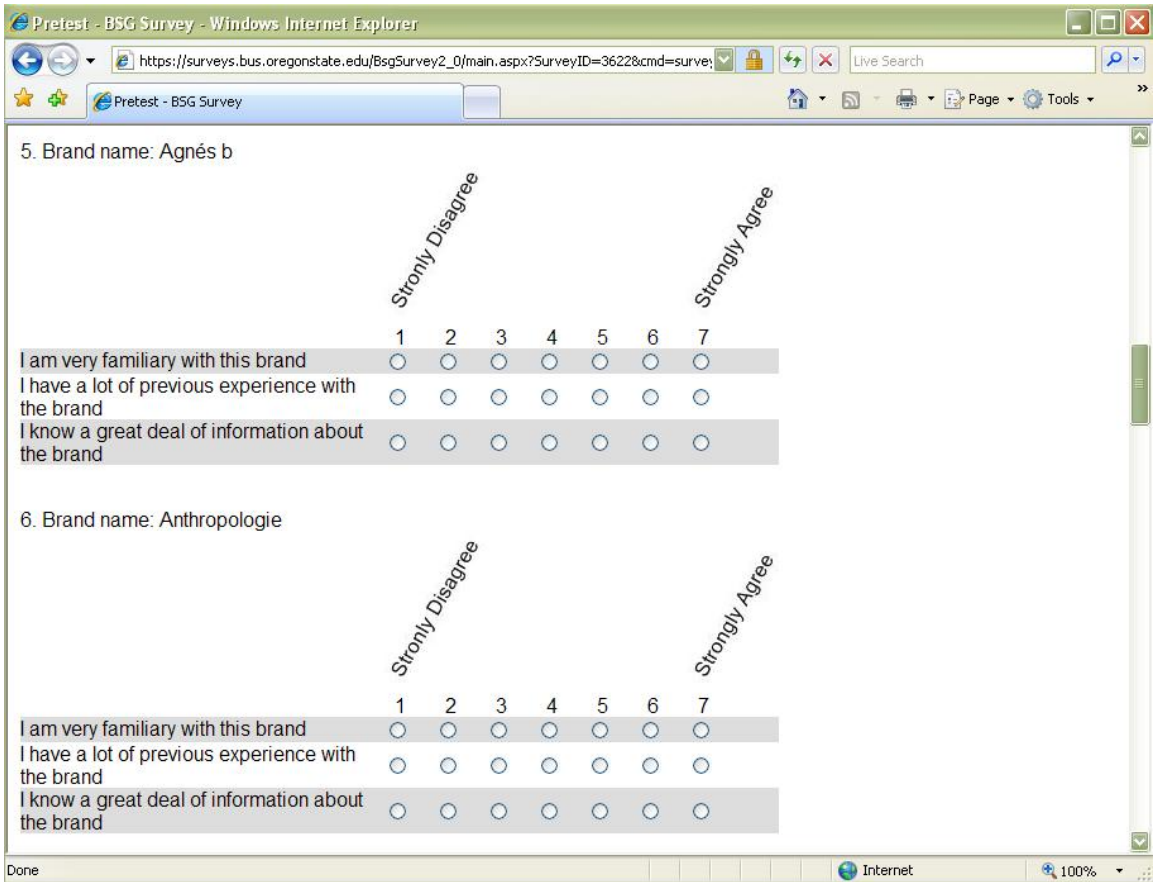
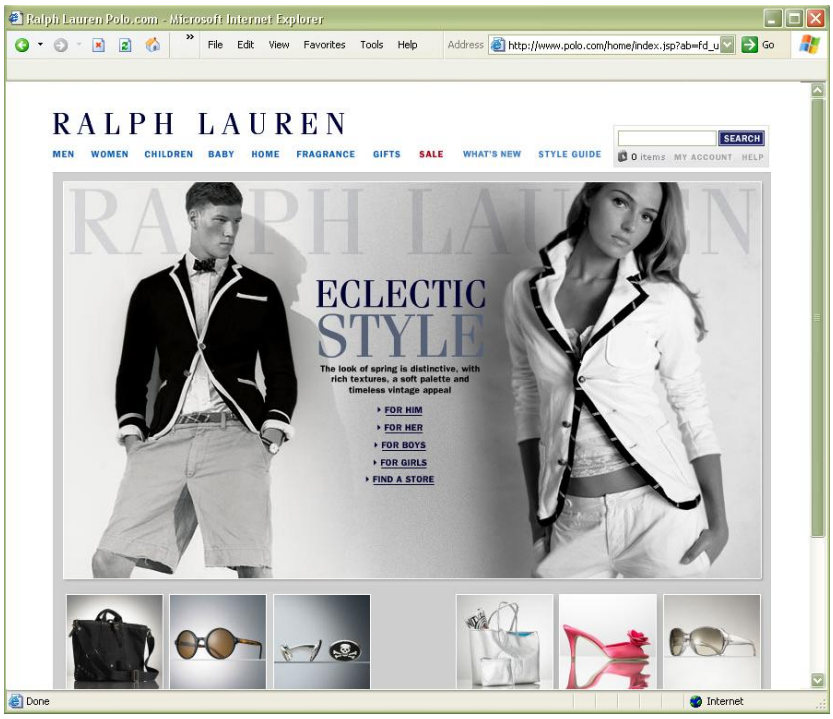
3. Brand name: J.crew
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
4. Brand name: French Connection (FCUK)
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
Done
Internet
100%


Pretest - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622&cmd=surve
Live Search
Pretest - BSG Survey
Page
Tools
5. Brand name: Agnés b
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
6. Brand name: Anthropologie
Stronly Disagree
Strongly Agree
1 2 3 4 5 6 7
I am very familiary with this brand
I have a lot of previous experience with the brand
I know a great deal of information about the brand
Done
Internet
100%

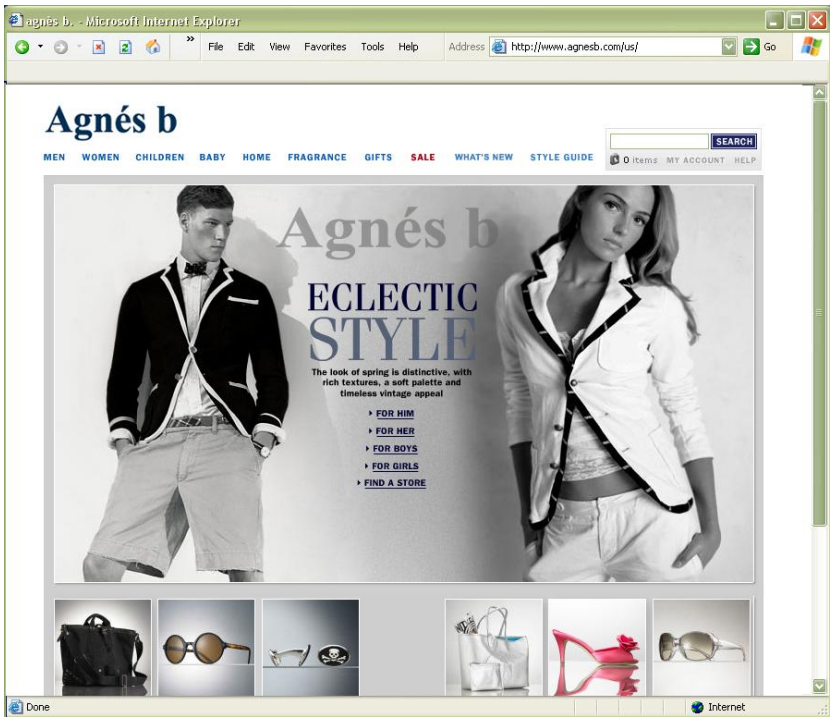
APPENDIX D

STUDY 1: HOME PAGES DESIGN AND BRAND FAMILIARITY MANIPULATION

(1) Image-oriented Home Page Design + Familiar Brand

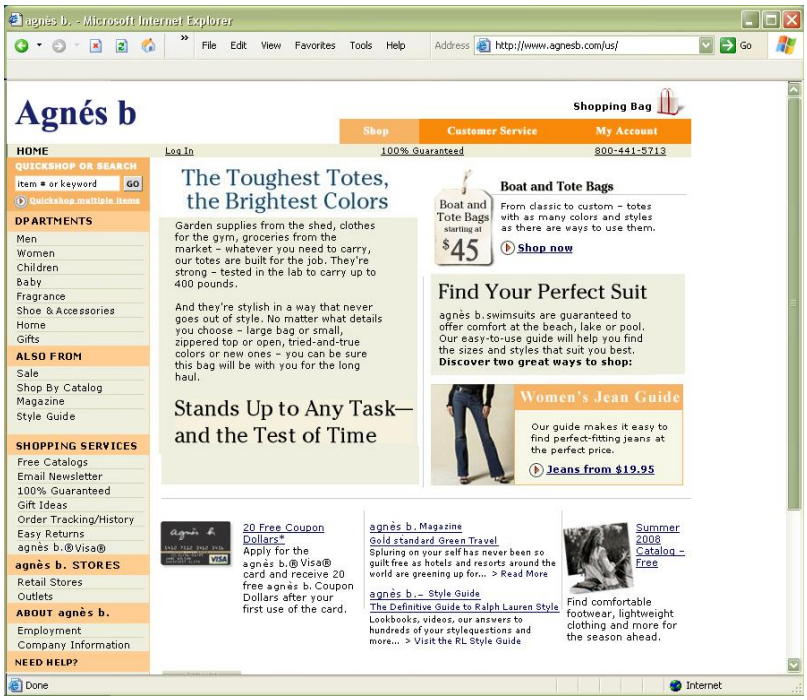


(2) Image-oriented Home Page Design + Unfamiliar Brand



(3) Text-oriented Home Page Design + Familiar Brand

(4) Text-oriented Home Page Design + Unfamiliar Brand



APPENDIX E

STUDY 1: QUESTIONNARE

SECTION 1. Please evaluate this website home page**.**

1. This website home page is								
Not at all eye-catching	1	2	3	4	5	6	7	Very eye-catching
2. Information on this website home page is								
Difficult to process	1	2	3	4	5	6	7	Easy to process

	Strongly disagree						Strongly agree
1. The way this home page displays its product is attractive	1	2	3	4	5	6	7
2. This website home page is visually appealing	1	2	3	4	5	6	7
3. I like the way this website home page looks	1	2	3	4	5	6	7
4. This is a good website	1	2	3	4	5	6	7
5. I like this website	1	2	3	4	5	6	7

SECTION 2. Please indicate the number of your response using the following system.

1. How likely is it that you would revisit the website that you saw today?								
Unlikely	1	2	3	4	5	6	7	Likely
Improbable	1	2	3	4	5	6	7	Probable
Not possible	1	2	3	4	5	6	7	Possible
2. How likely is that you would browse more products on the website that you saw today? In order words, how likely is it that you would click to go to the product pages on this website?								
Unlikely	1	2	3	4	5	6	7	Likely
Improbable	1	2	3	4	5	6	7	Probable
Not possible	1	2	3	4	5	6	7	Possible

SECTION 3. Please indicate the number of your response using the following system.

	Strongly disagree						Strongly agree
1. Owning products that have superior design makes me feel good about myself	1	2	3	4	5	6	7
2. I enjoy seeing displays of products that have superior designs	1	2	3	4	5	6	7
3. A product's design is a source of pleasure for me	1	2	3	4	5	6	7
4. Beautiful product designs make our world a better place to live	1	2	3	4	5	6	7
5. Being able to see subtle differences in product designs is one skill that I have developed over time	1	2	3	4	5	6	7
6. I see things in a product's design that over people tend to pass over	1	2	3	4	5	6	7
7. I have the ability to imagine how a product will fit in with designs of other things I already own	1	2	3	4	5	6	7
8. I have a pretty good idea of what makes one product look better than its competitors	1	2	3	4	5	6	7
9. Sometimes the way a product looks seems to reach out and grab me	1	2	3	4	5	6	7
10. If a product's design really "speaks" to me, I feel that I must buy it	1	2	3	4	5	6	7
11. When I see a product that has a really great design, I feel a strong urge to buy it	1	2	3	4	5	6	7

SECTION 4. Please answer about this brand.

	Strongly disagree						Strongly agree
1. I am familiar with this brand	1	2	3	4	5	6	7
2. I know a great deal about the brand	1	2	3	4	5	6	7
3. I have a lot of previous experience with the brand	1	2	3	4	5	6	7

SECTION 5. Please answer the following questions based on your own experience.

	Never	1-6	7-12	13-18	19-24	25-30	30-
1. How often do you use Internet?	1	2	3	4	5	6	7
	Never	1-4	5-8	9-12	13-16	17-20	20-
2. How often do you browse for products online except for apparel?	1	2	3	4	5	6	7
3. How often do you browse for apparel online?	1	2	3	4	5	6	7
	Never	1-2	3-4	5-6	7-8	9-10	10-
4. How often do you purchase products online except for apparel?	1	2	3	4	5	6	7
5. How often do you purchase apparel online?	1	2	3	4	5	6	7

SECTION 6. Please check the item that best describes you.

1. Please enter your age _____

2. What is your gender?
   □ Male □ Female

3. What is your class standing?
   □ Freshman □ Sophomore
   □ Junior □ Senior
   □ Graduate Student □ Other (please specify) _____

4. In what college at OSU is your major?
   □ Agricultural Sciences □ Business
   □ Education □ Engineering
   □ Forestry □ Health and Human Sciences
   □ Liberal Arts □ Pharmacy
   □ Science □ Other (please specify) _____

5. What is your ethnicity?
   □ Caucasian □ African American
   □ Asian/ Asian American □ Hispanic American
   □ Native American □ Other (please specify) _____

APPENDIX F

STUDY 1: RESULTS

Pretest

Table F.1. Descriptive statistics for brand familiarity (N = 83)

Variable	Cronbach's α	Min.	Max.	Mean	*SD*
Polo Ralph Lauren	.86	1	7	4.72	1.78
J. Crew	.89	1	7	4.22	1.54
Anthropologie	.90	1	7	4.23	1.79
Club Monaca	.74	1	7	1.87	1.31
French Connection	.91	1	7	2.78	1.74
Agnés b	.97	1	7	1.32	.97

Main Experiment

Table F.2. Factor loadings of CVPA: three-factor solution

Item	Value	Acumen	Response
Owning products that have superior design makes me feel good about myself	.66		
I enjoy seeing displays of products that have superior designs	.80		
A product's design is a source of pleasure for me	.79		
Being able to see subtle differences in product designs is one skill that I have developed over time		.84	
I see things in a product's design that other people tend to pass over		.85	
I have the ability to imagine how a product will fit in with designs of other things I already own		.63	
I have a pretty good idea of what makes one product look better than its competitors		.67	
Sometimes the way a product looks seems to reach out and grab me			.53
If a product's design really "speaks" to me, I feel that I must buy it			.83
When I see a product that has a really great design, I feel a strong urge to buy it			.79

Table F.3. Results from CFA of the respecified measurement model

	Parameter	Est.	*SE*	*t*
Path coefficient				
Visual fluency → F1	λ_{11}	.91	.06	29.84***
Visual fluency → F2	λ_{21}	.81	.07	24.93***
Perceived aesthetics → A1	λ_{32}	.97	.06	34.00***
Perceived aesthetics → A2	λ_{42}	.98	.06	34.68***
Preference → P1	λ_{53}	.97	.05	34.11***
Preference → P2	λ_{63}	.99	.06	35.09***
Behavioral intentions → B1	λ_{74}	.94	.06	32.14***
Behavioral intentions → B2	λ_{84}	.98	.05	34.45***
Factor covariance				
Visual fluency ↔ Perceived aesthetics	φ_{21}	.98	.01	124.68***
Visual fluency ↔ Preference	φ_{31}	.96	.01	110.20***
Visual fluency ↔ Behavioral intentions	φ_{41}	.87	.01	62.96***
Perceived aesthetics ↔ Preference	φ_{32}	.96	.00	225.33***
Perceived aesthetics ↔ Behavioral intentions	φ_{42}	.89	.01	91.69***
Preference ↔ Behavioral intentions	φ_{43}	.90	.01	99.11***
Model fit				
Chi-square		50.50	(*df* = 14)	
RMSEA		.063	90% C. I. (.045; .082)	
TLI		.99		
NFI		.99		
CFI		.99		
IFI		.99		

APPENDIX G

STUDY 2: PRETEST 1
PRODUCT IMAGES

1
2
3
4
5
6
7
8

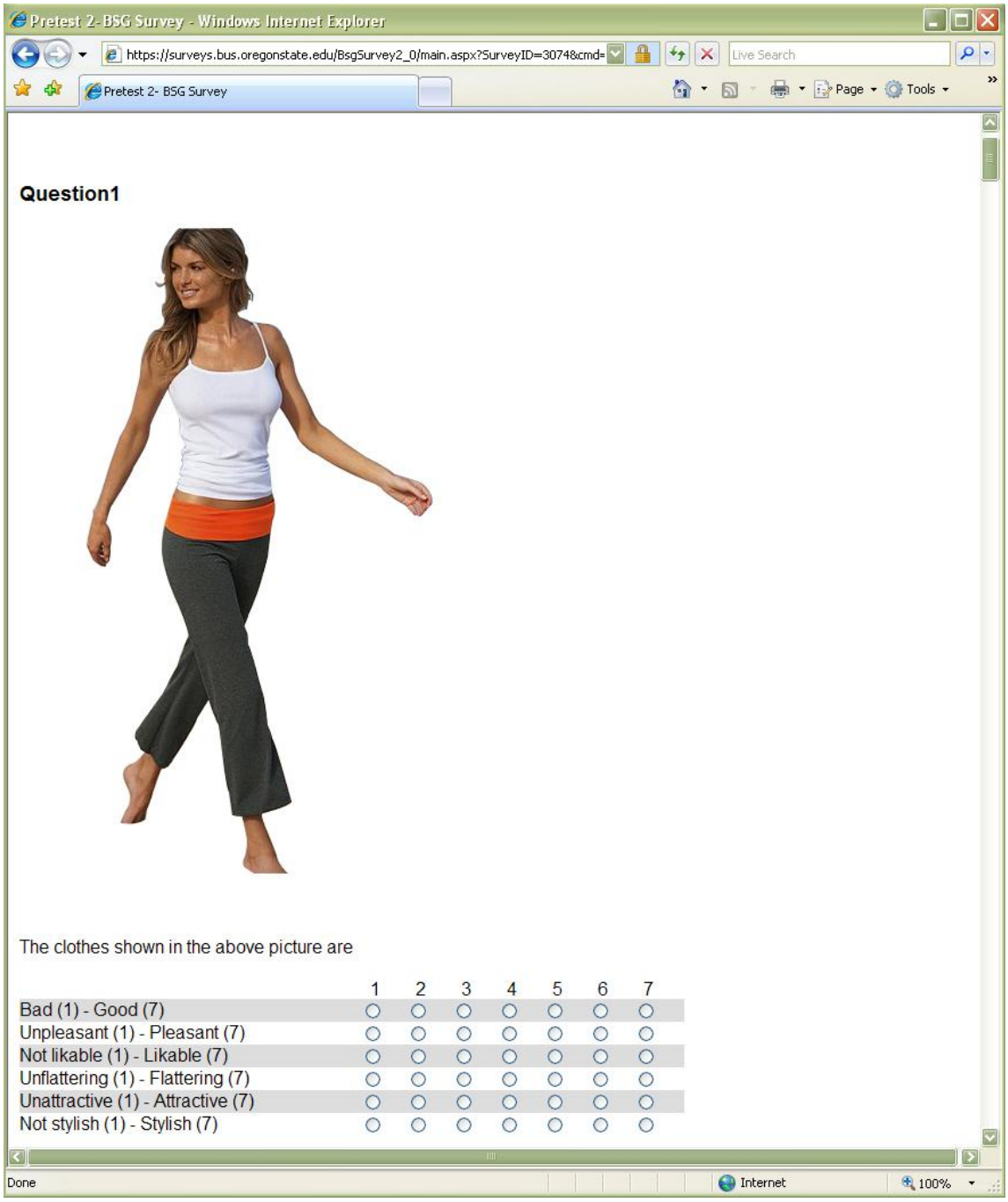
INSTRUCTION. Please indicate how you felt when you saw the visual and read written product information on the website.

		Strongly Disagree						Strongly Agree
1.	I imagined that I was actually wearing the clothes shown on the website	1	2	3	4	5	6	7
2.	It was easy for me to imagine wearing the clothes	1	2	3	4	5	6	7
3.	I fantasized about wearing the clothes	1	2	3	4	5	6	7
4.	I could easily construct a story about myself and the clothes based on my imagination	1	2	3	4	5	6	7
5.	The mental images that came to mind were very clear and specific	1	2	3	4	5	6	7
6.	The mental images that came to mind formed a series of events in my mind which I was a part of	1	2	3	4	5	6	7
7.	While browsing the product presentation, many images came to mind	1	2	3	4	5	6	7
8.	The images that came to mind acted as a source of information about the clothes	1	2	3	4	5	6	7
9.	I could actually see myself in this scenario	1	2	3	4	5	6	7

Overall, the images that came to mind while I browsed the website were								
10. dull	1	2	3	4	5	6	7	Sharp
11. weak	1	2	3	4	5	6	7	Intense
12. Unclear	1	2	3	4	5	6	7	Clear
13. Vague	1	2	3	4	5	6	7	Vivid

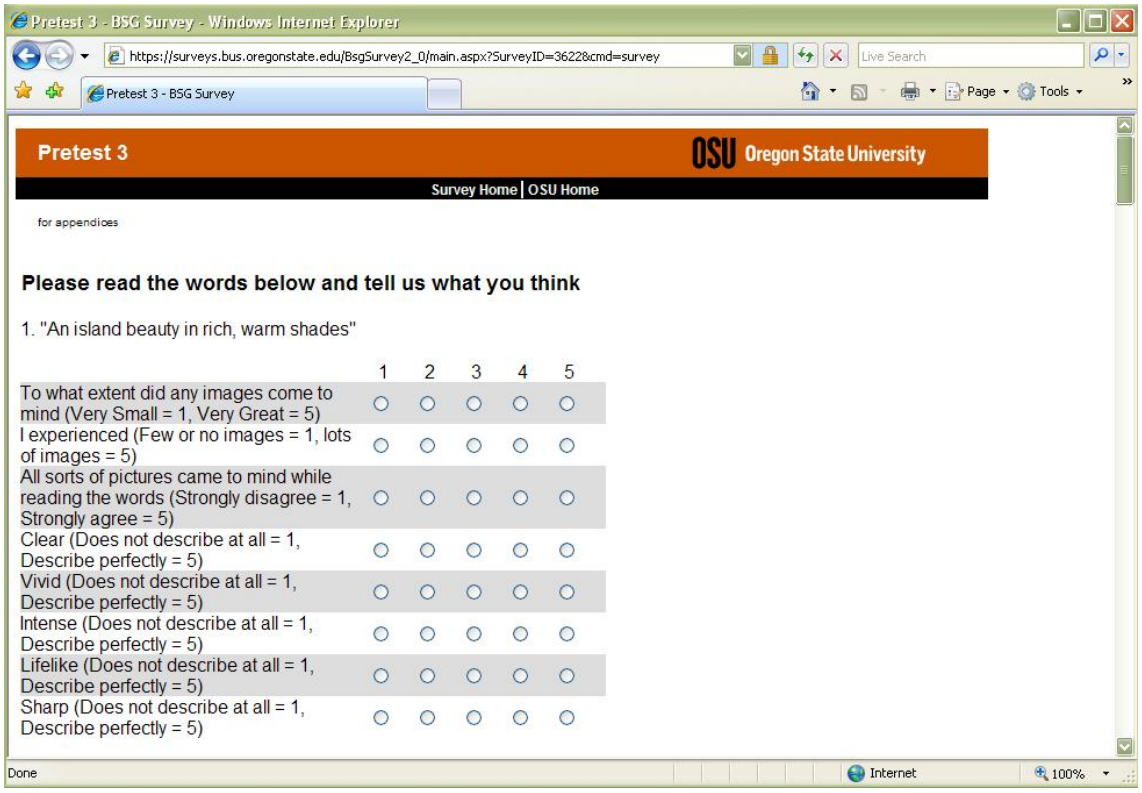
APPENDIX H

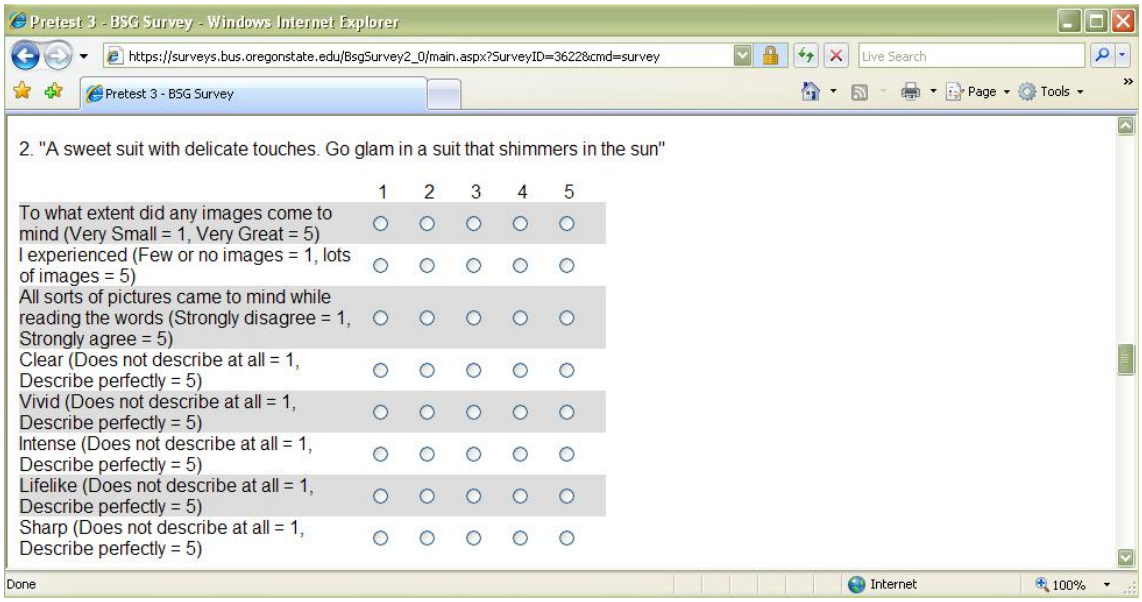
STUDY 2: PRETEST 2
EXAMPLE OF GARMENT FASHIONABILITY MEASURE

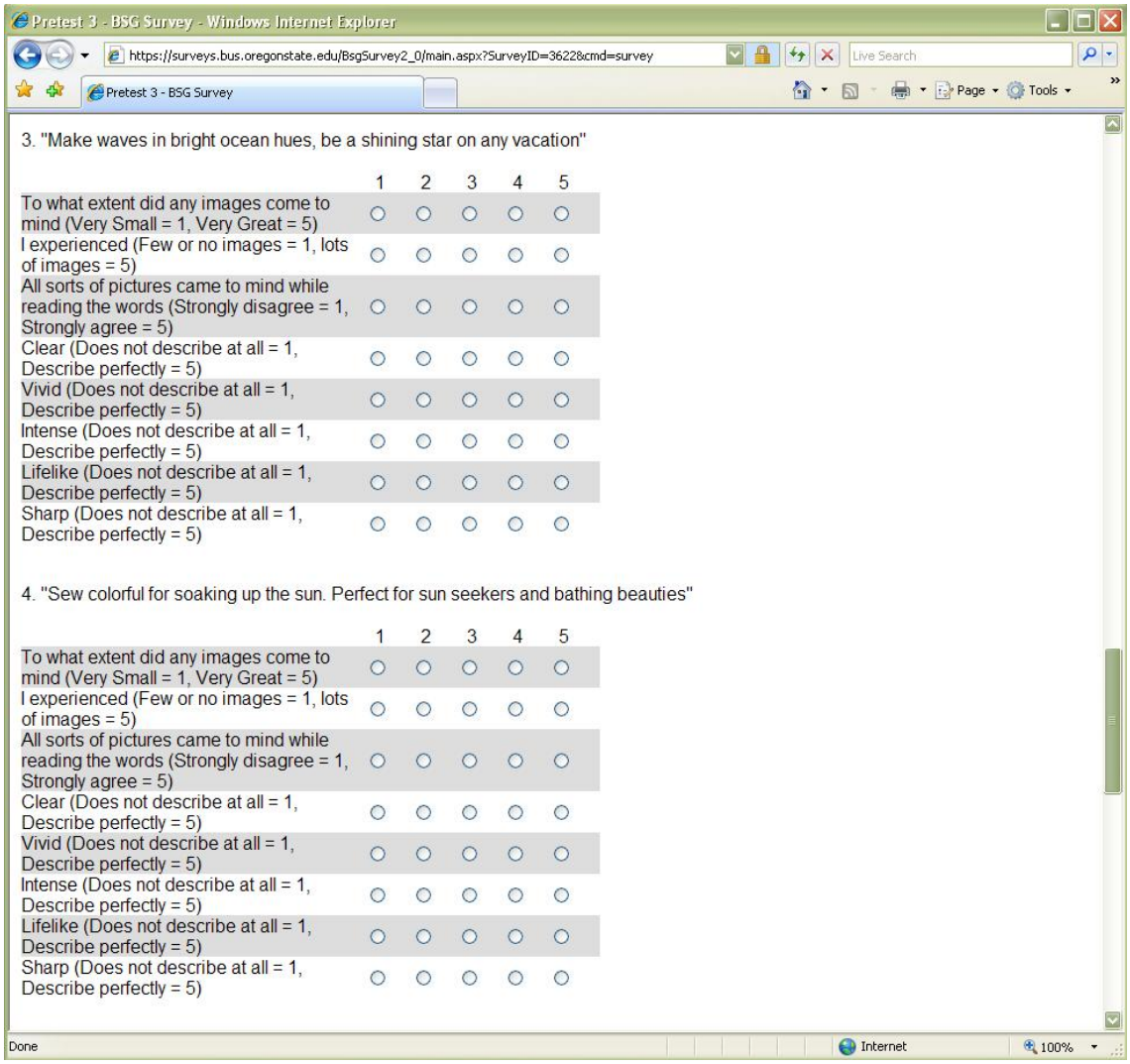

Pretest 2- BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3074&cmd=
Live Search
Pretest 2- BSG Survey
Page
Tools
Question1
The clothes shown in the above picture are
1 2 3 4 5 6 7
Bad (1) - Good (7)
Unpleasant (1) - Pleasant (7)
Not likable (1) - Likable (7)
Unflattering (1) - Flattering (7)
Unattractive (1) - Attractive (7)
Not stylish (1) - Stylish (7)
Done
Internet
100%

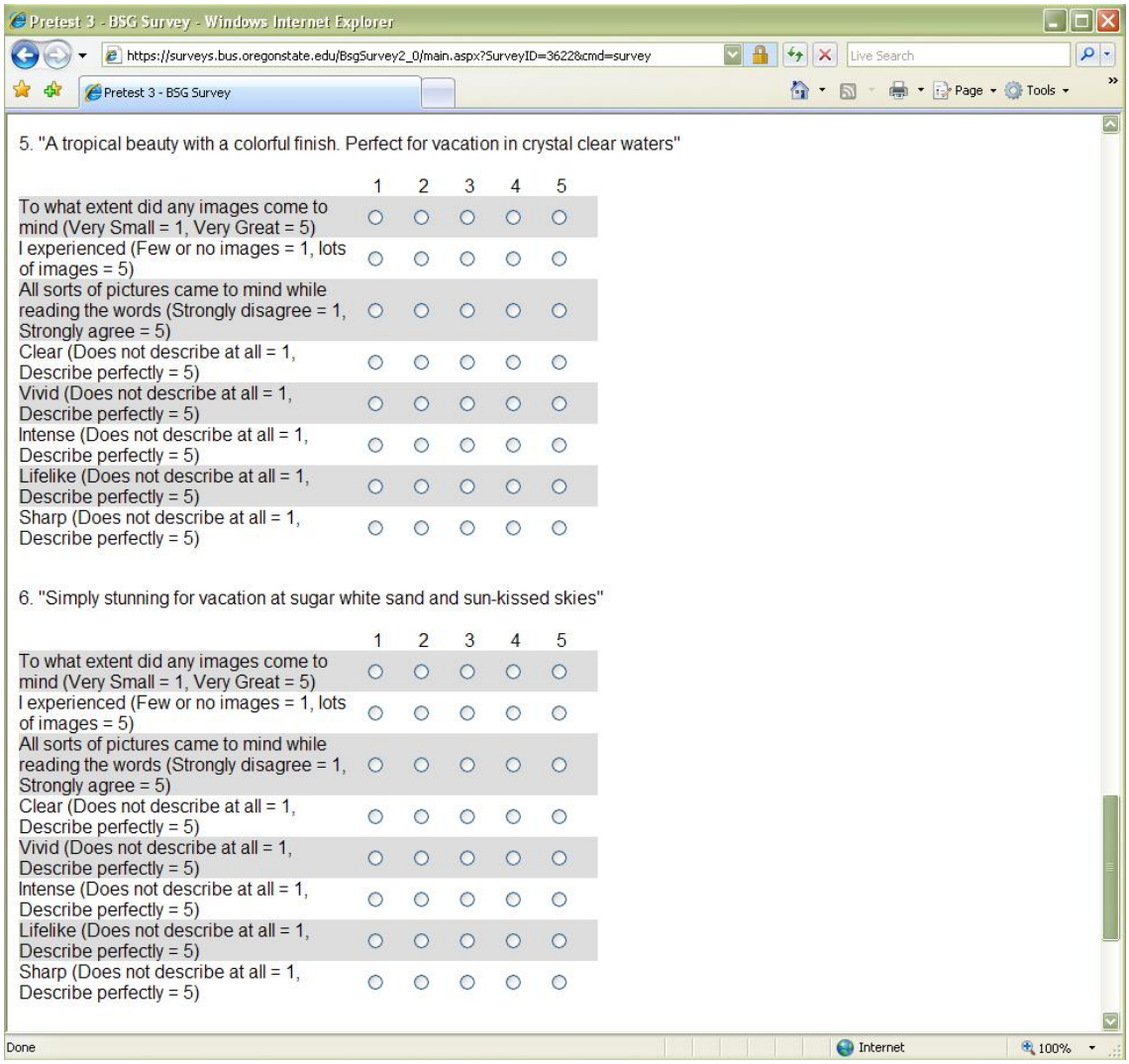
APPENDIX I

STUDY 2: PRETEST 3
VERBAL DESCRIPTIONS


Pretest 3 - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622&cmd=survey
Live Search
Pretest 3 - BSG Survey
Page
Tools
Pretest 3
OSU Oregon State University
Survey Home | OSU Home
for appendices
Please read the words below and tell us what you think
1. "An island beauty in rich, warm shades"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
Done
Internet
100%

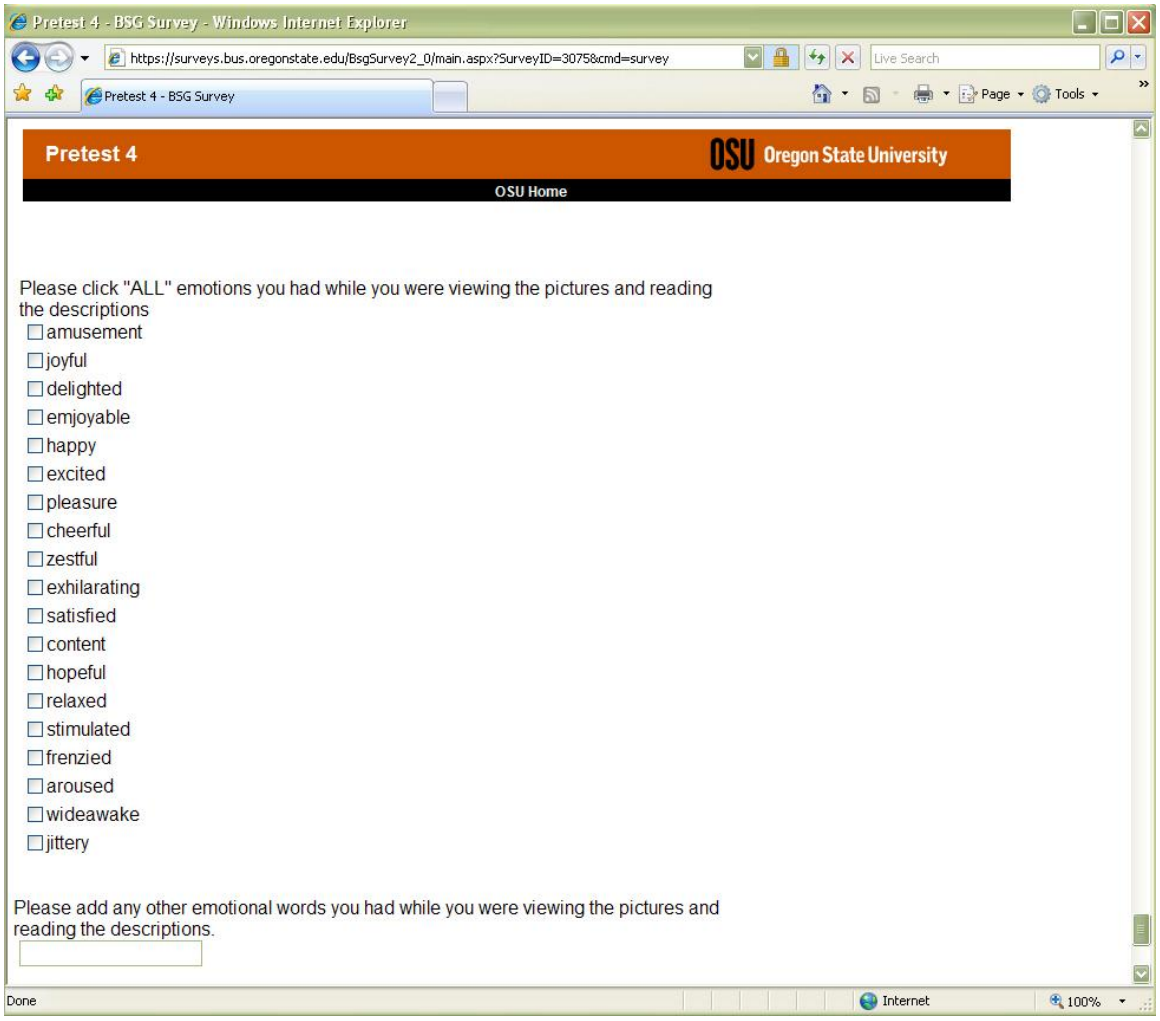

Pretest 3 - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622&cmd=survey
Live Search
Pretest 3 - BSG Survey
Page
Tools
2. "A sweet suit with delicate touches. Go glam in a suit that shimmers in the sun"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
Done
Internet
100%


Pretest 3 - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622&cmd=survey
Live Search
Pretest 3 - BSG Survey
Page
Tools
3. "Make waves in bright ocean hues, be a shining star on any vacation"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
4. "Sew colorful for soaking up the sun. Perfect for sun seekers and bathing beauties"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
Done
Internet
100%


Pretest 3 - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3622&cmd=survey
Live Search
Pretest 3 - BSG Survey
Page
Tools
5. "A tropical beauty with a colorful finish. Perfect for vacation in crystal clear waters"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
6. "Simply stunning for vacation at sugar white sand and sun-kissed skies"
1 2 3 4 5
To what extent did any images come to mind (Very Small = 1, Very Great = 5)
I experienced (Few or no images = 1, lots of images = 5)
All sorts of pictures came to mind while reading the words (Strongly disagree = 1, Strongly agree = 5)
Clear (Does not describe at all = 1, Describe perfectly = 5)
Vivid (Does not describe at all = 1, Describe perfectly = 5)
Intense (Does not describe at all = 1, Describe perfectly = 5)
Lifelike (Does not describe at all = 1, Describe perfectly = 5)
Sharp (Does not describe at all = 1, Describe perfectly = 5)
Done
Internet
100%

APPENDIX J

STUDY 2: PRETEST 4
POSITIVE EMOTION SCALE


Pretest 4 - BSG Survey - Windows Internet Explorer
https://surveys.bus.oregonstate.edu/BsgSurvey2_0/main.aspx?SurveyID=3075&cmd=survey
Live Search
Pretest 4 - BSG Survey
Page
Tools
Pretest 4
OSU Oregon State University
OSU Home
Please click "ALL" emotions you had while you were viewing the pictures and reading the descriptions
amusement
joyful
delighted
emjoyable
happy
excited
pleasure
cheerful
zestful
exhilarating
satisfied
content
hopeful
relaxed
stimulated
frenzied
aroused
wideawake
jittery
Please add any other emotional words you had while you were viewing the pictures and reading the descriptions.
Done
Internet
100%

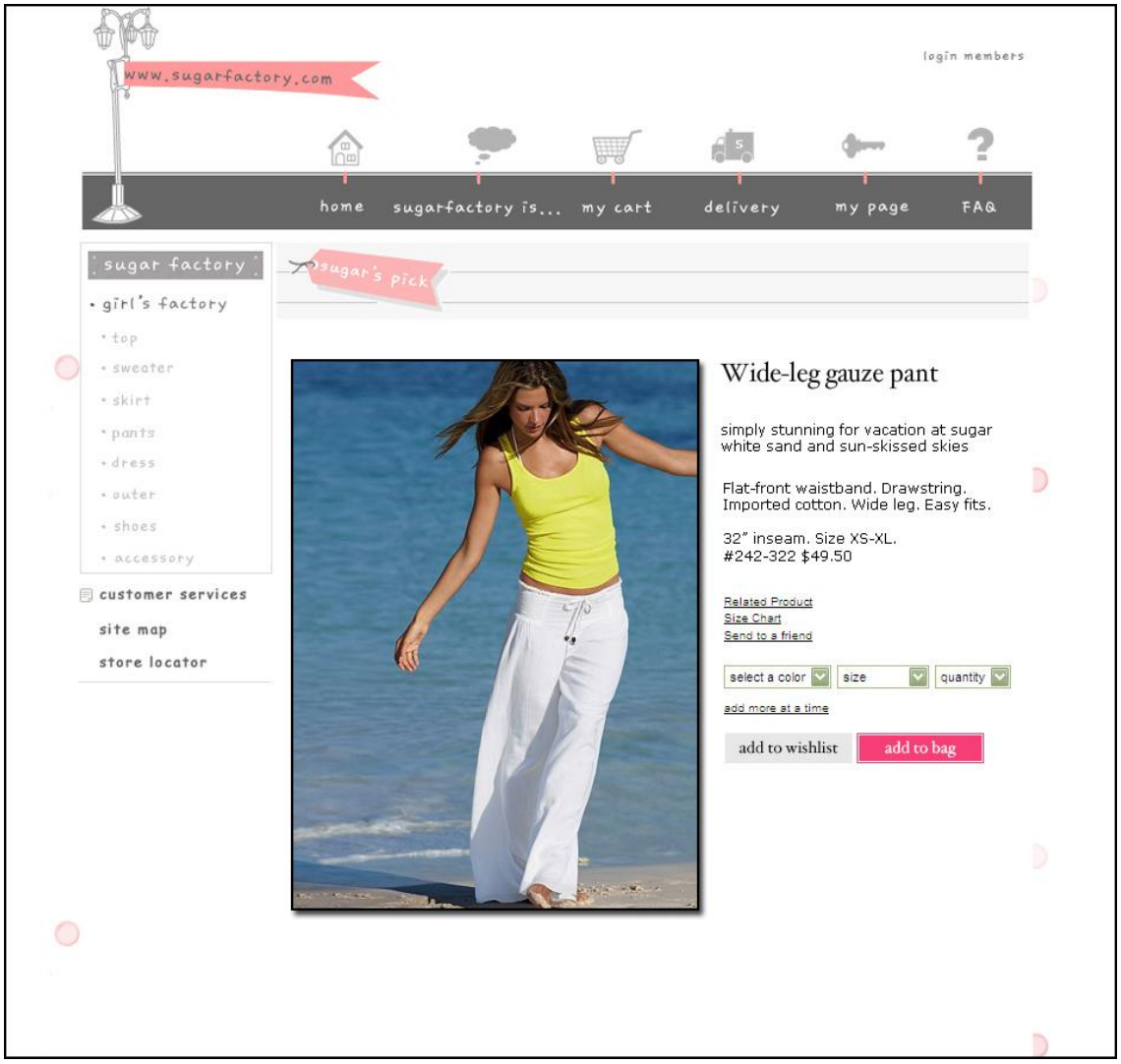
APPENDIX K

STUDY 2: APPAREL WEBSITES

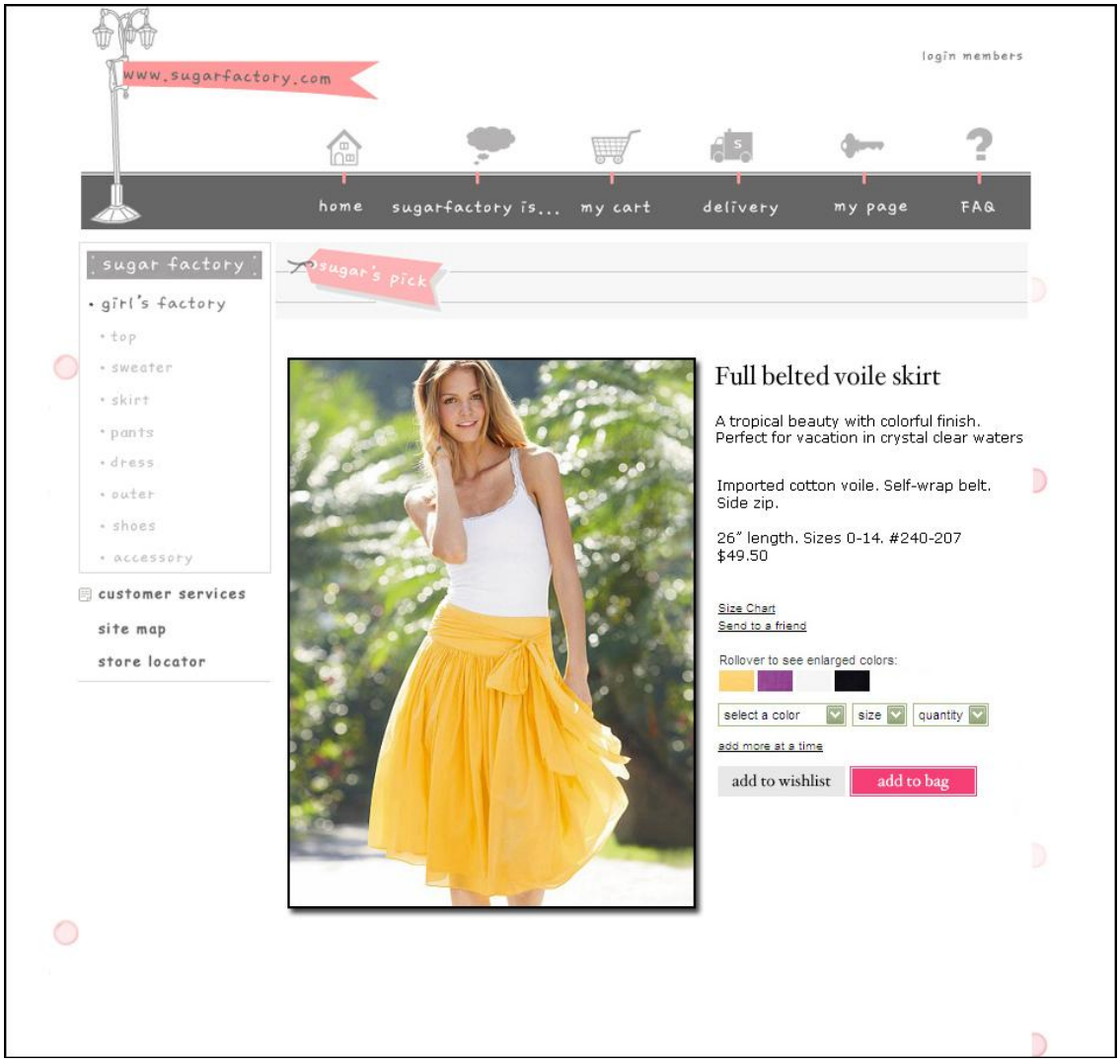
CONDITON 1

A product image with a concrete background + concrete verbal descriptions

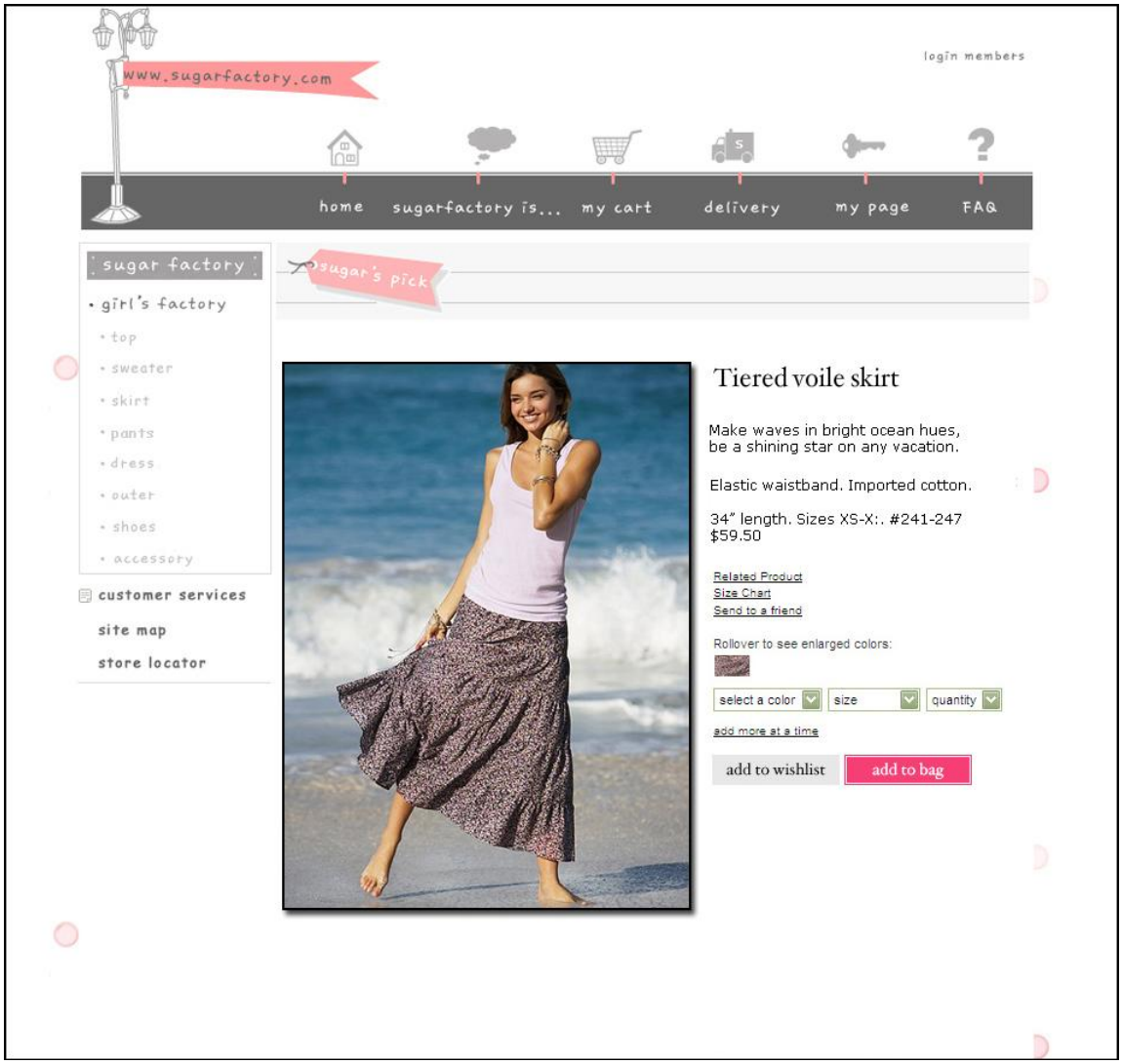
Style #1



Style #2


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
girl's factory
top
sweater
skirt
pants
dress
outer
shoes
accessory
customer services
site map
store locator
sugar's pick
Full belted voile skirt
A tropical beauty with colorful finish.
Perfect for vacation in crystal clear waters
Imported cotton voile. Self-wrap belt.
Side zip.
26" length. Sizes 0-14. #240-207
$49.50
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

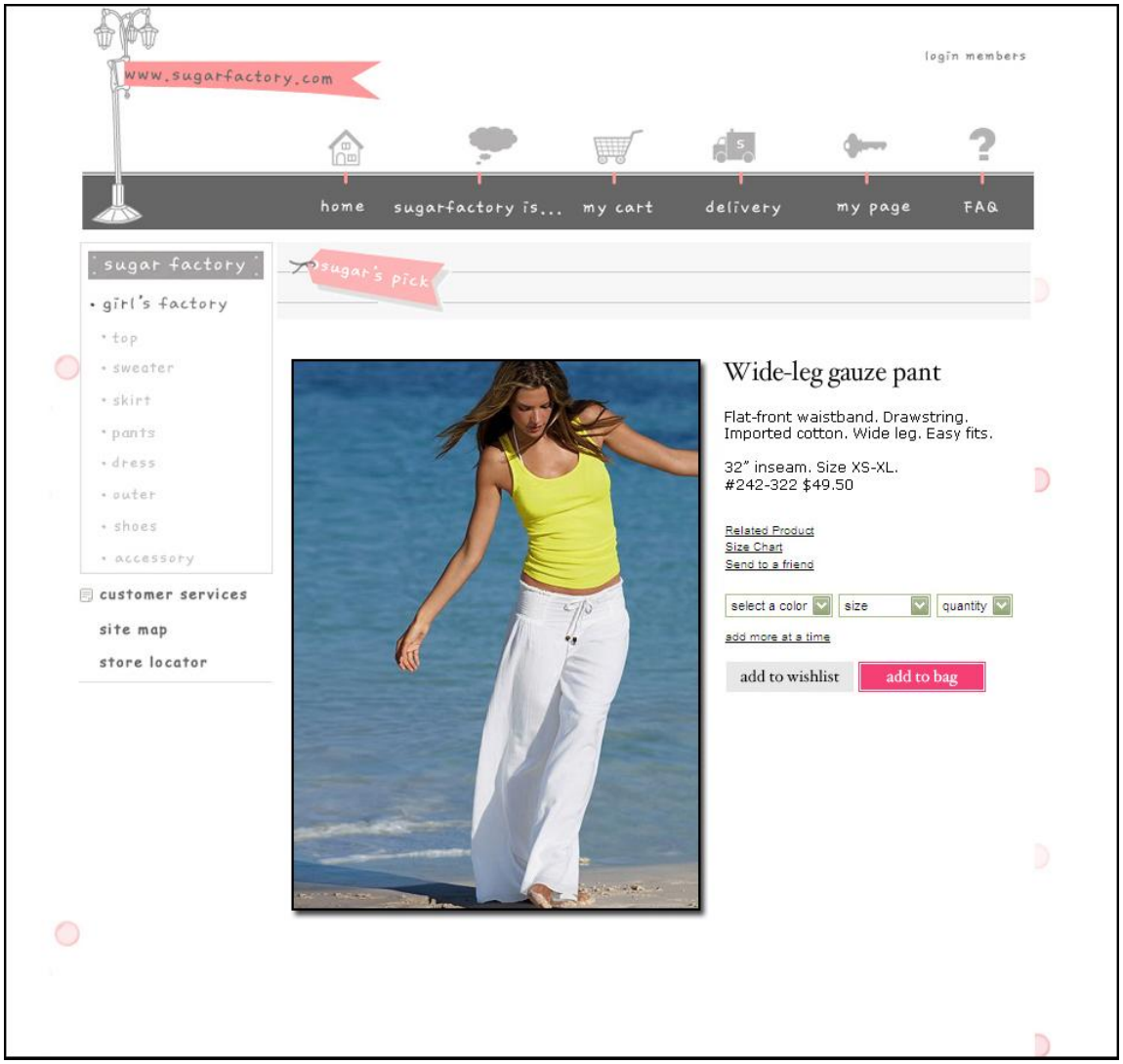
Style #3


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
• girl's factory
• top
• sweater
• skirt
• pants
• dress
• outer
• shoes
• accessory
customer services
site map
store locator
sugar's pick
Tiered voile skirt
Make waves in bright ocean hues, be a shining star on any vacation.
Elastic waistband. Imported cotton.
34" length. Sizes XS-X:. #241-247
$59.50
Related Product
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

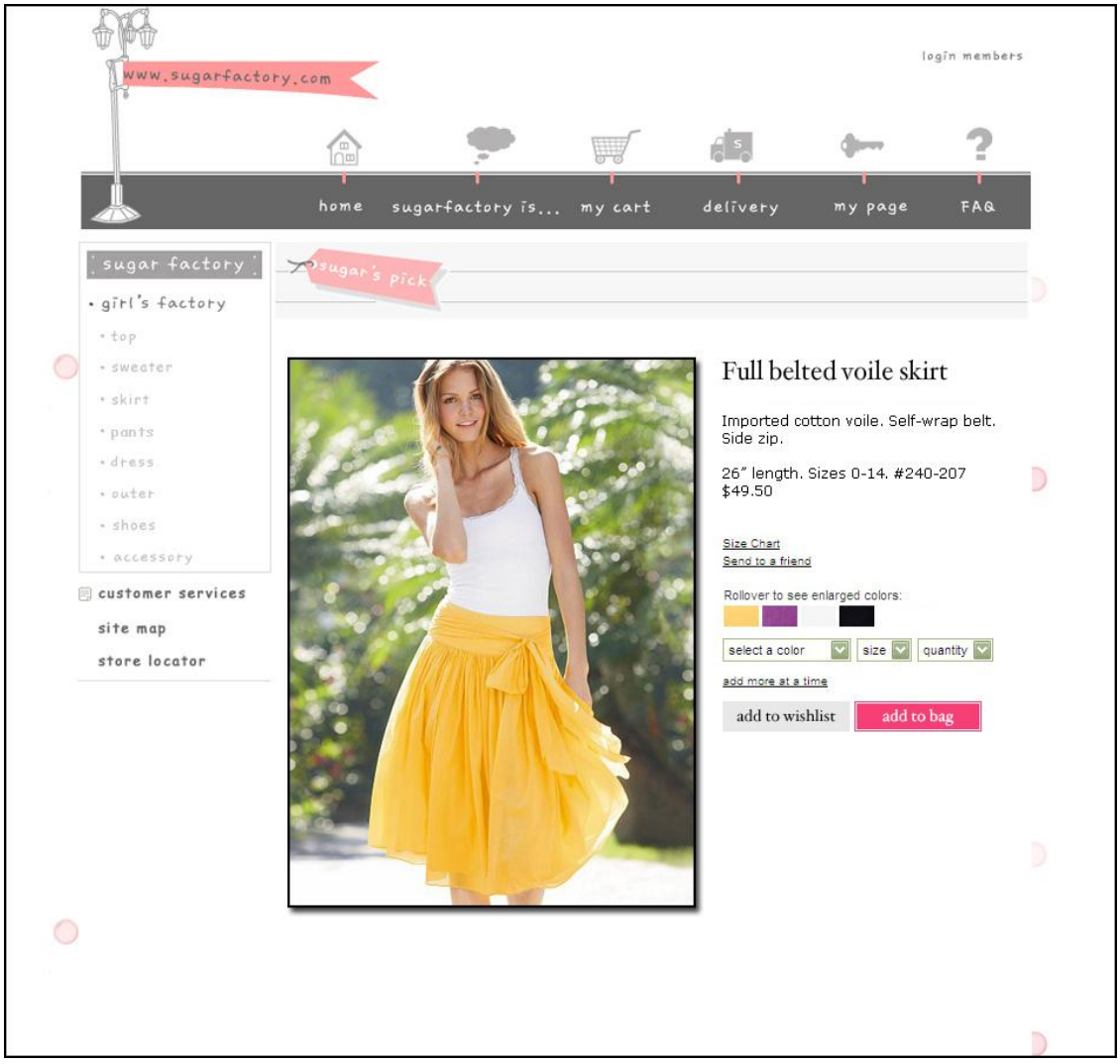
CONDITON 2

A product image with a concrete background + no concrete verbal descriptions

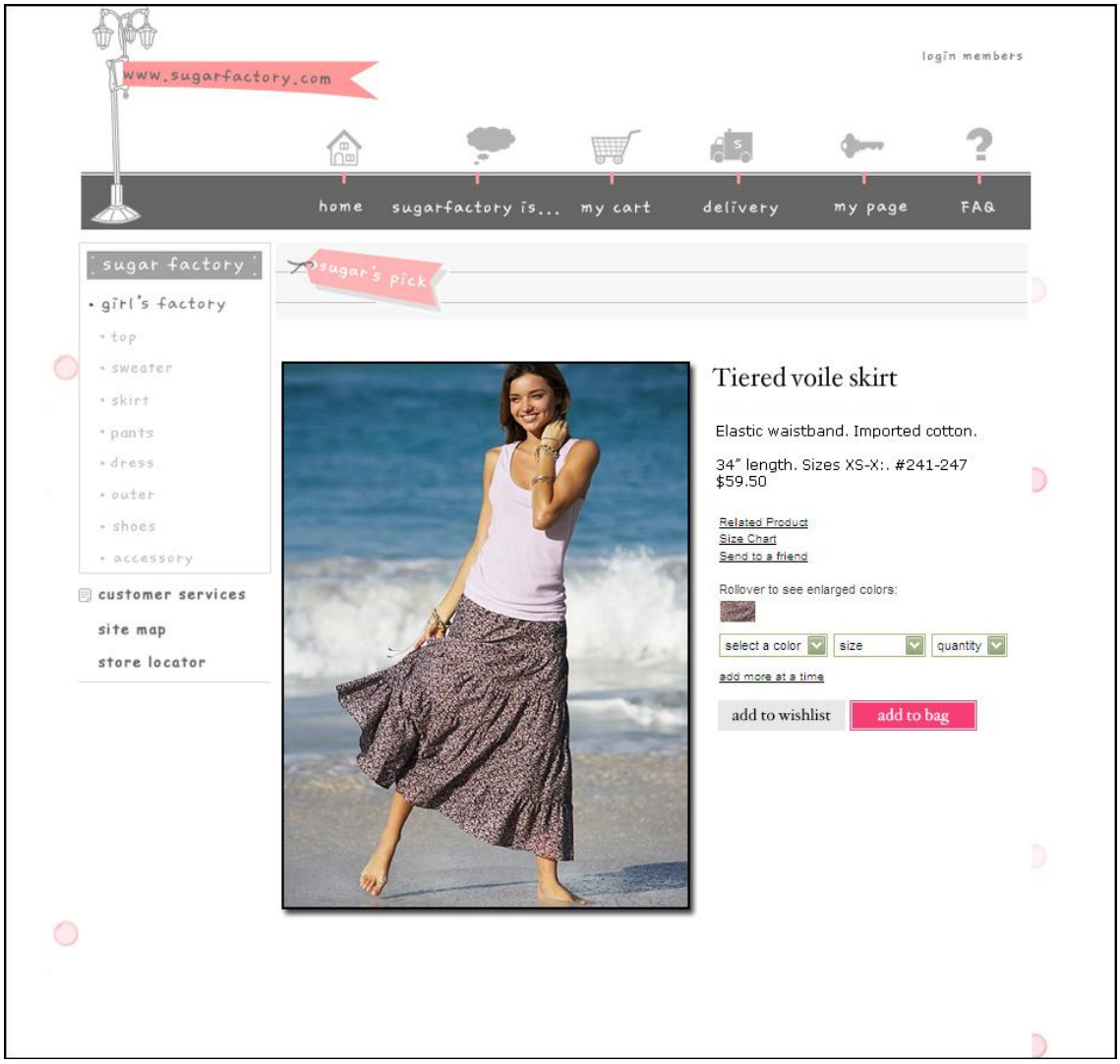
Style #1



Style #2


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
girl's factory
top
sweater
skirt
pants
dress
outer
shoes
accessory
customer services
site map
store locator
sugar's pick
Full belted voile skirt
Imported cotton voile. Self-wrap belt. Side zip.
26" length. Sizes 0-14. #240-207
$49.50
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

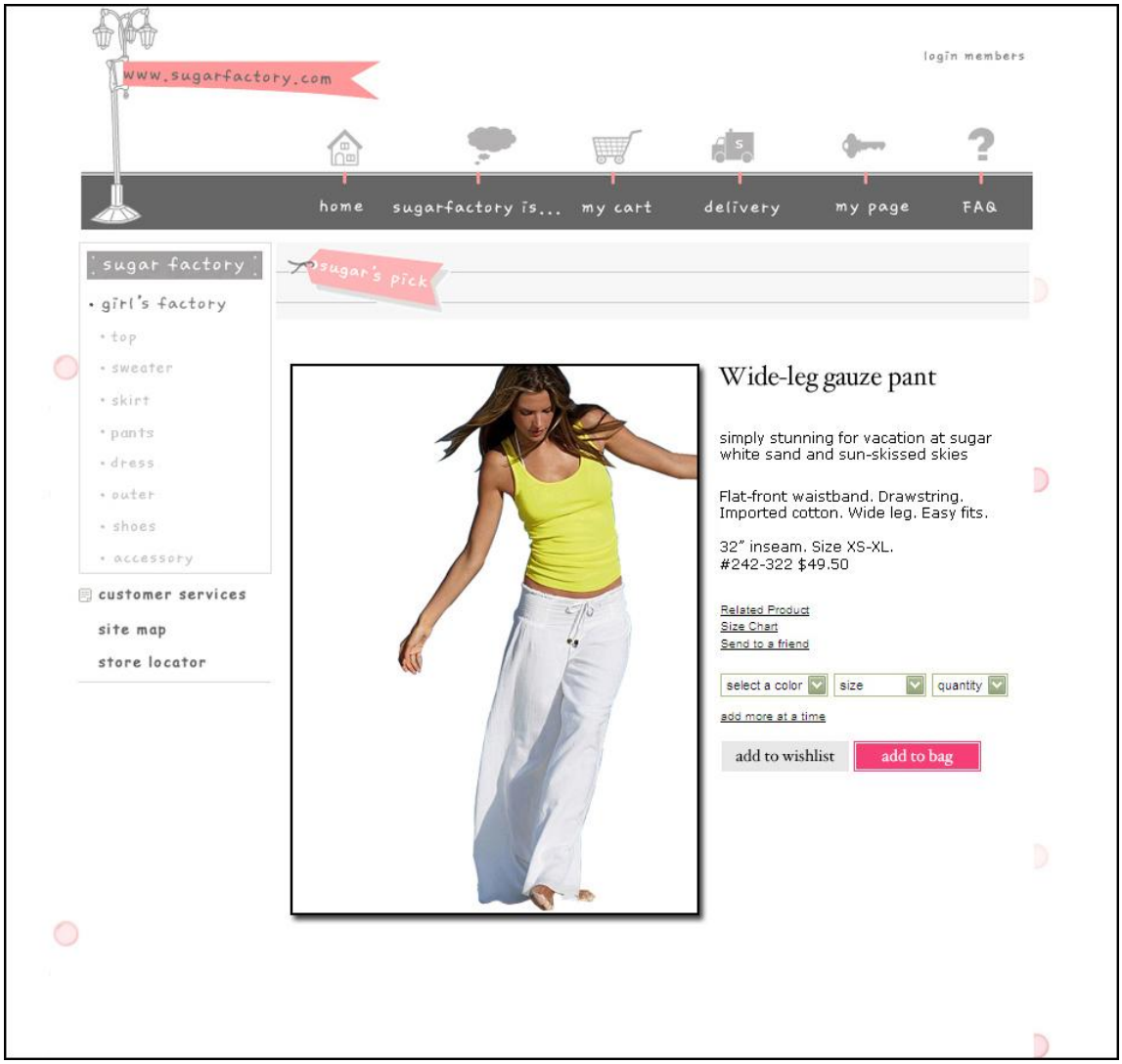
Style #3


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
• girl's factory
• top
• sweater
• skirt
• pants
• dress
• outer
• shoes
• accessory
customer services
site map
store locator
sugar's pick
Tiered voile skirt
Elastic waistband. Imported cotton.
34" length. Sizes XS-X:. #241-247
$59.50
Related Product
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

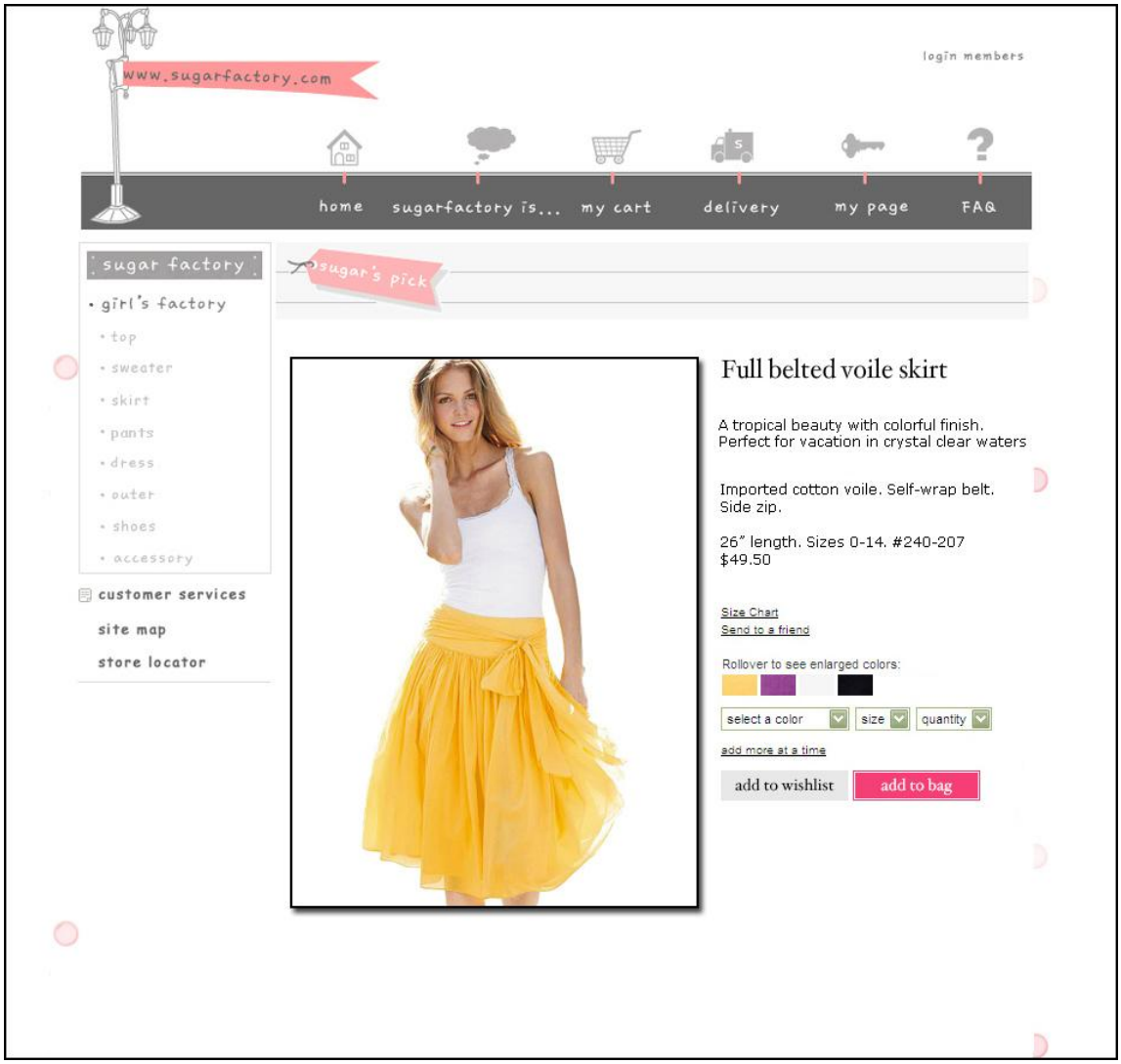
CONDITON 3

A product image with no concrete background + concrete verbal descriptions

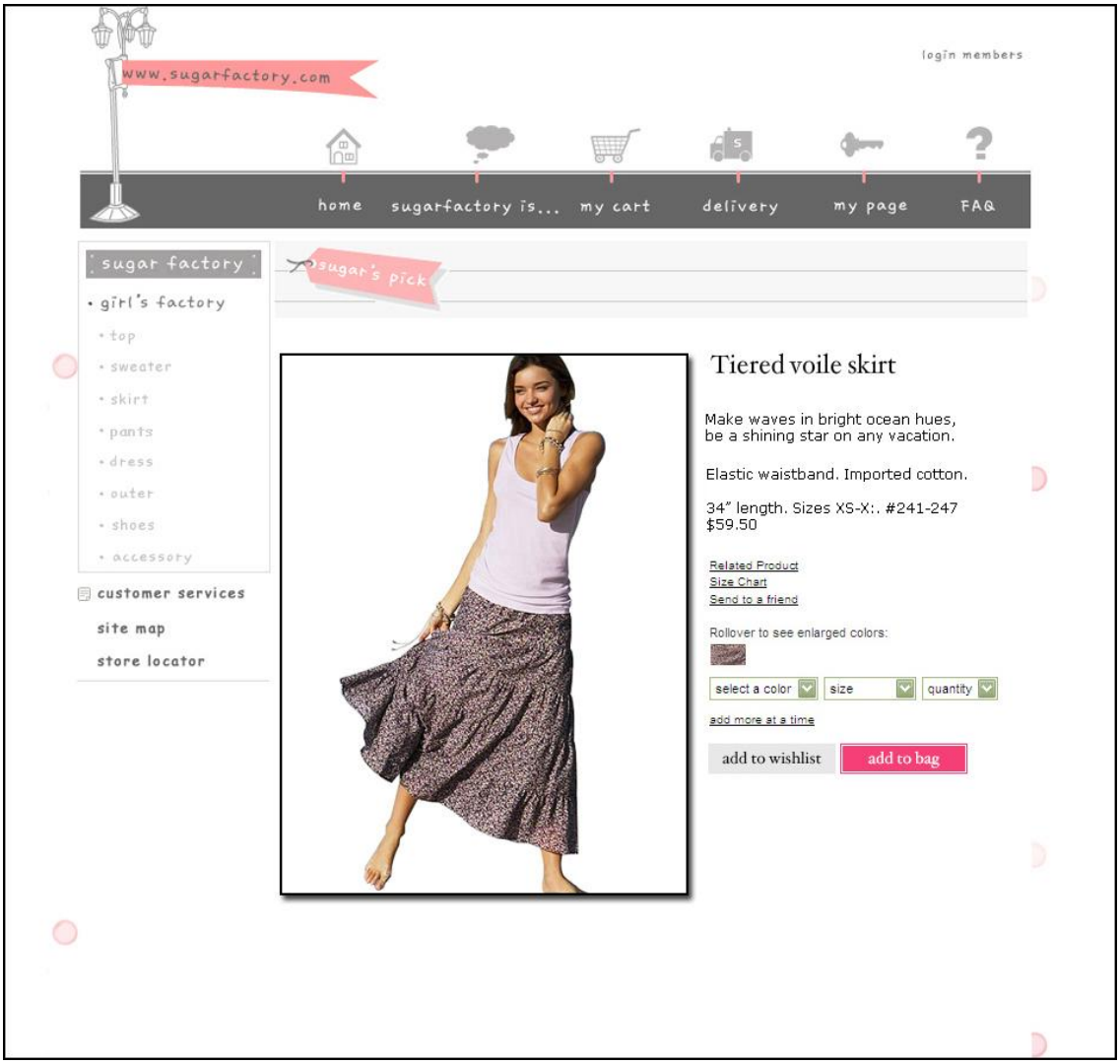
Style #1



Style #2


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
• girl's factory
• top
• sweater
• skirt
• pants
• dress
• outer
• shoes
• accessory
customer services
site map
store locator
sugar's pick
Full belted voile skirt
A tropical beauty with colorful finish.
Perfect for vacation in crystal clear waters
Imported cotton voile. Self-wrap belt.
Side zip.
26" length. Sizes 0-14. #240-207
$49.50
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

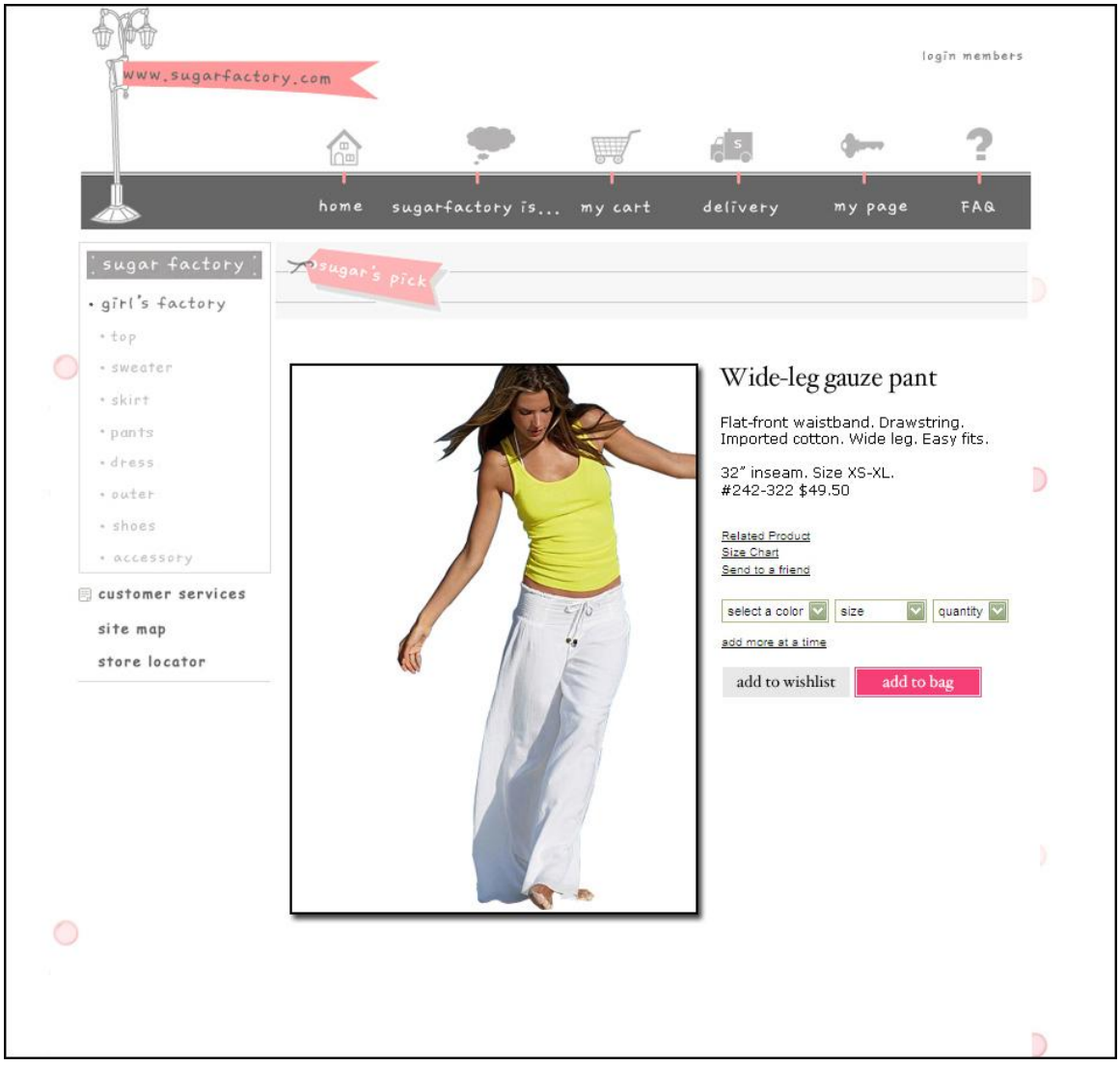
Style #3


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
• girl's factory
• top
• sweater
• skirt
• pants
• dress
• outer
• shoes
• accessory
customer services
site map
store locator
sugar's pick
Tiered voile skirt
Make waves in bright ocean hues,
be a shining star on any vacation.
Elastic waistband. Imported cotton.
34" length. Sizes XS-X:. #241-247
$59.50
Related Product
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

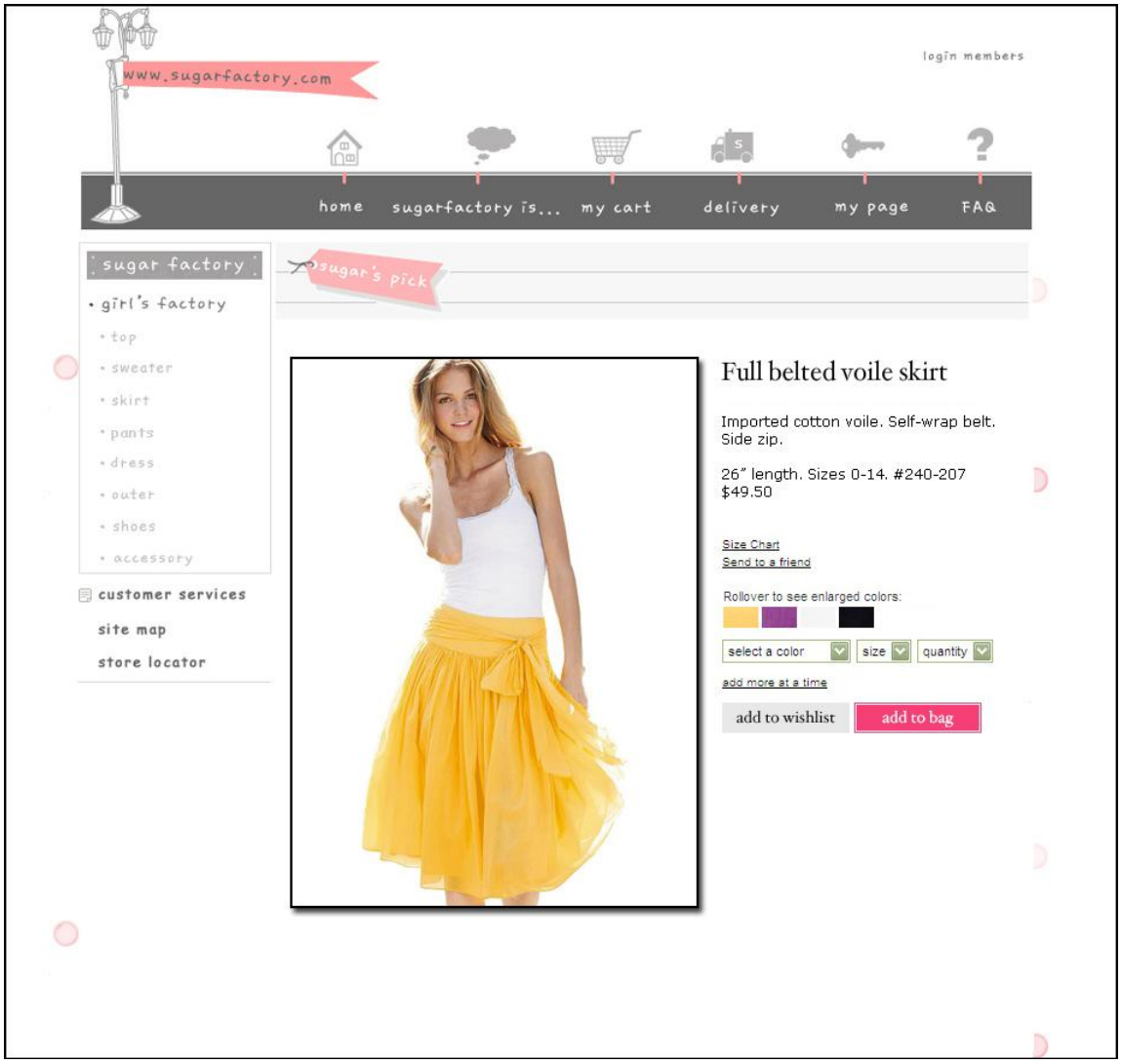
CONDITON 4

A product image with no concrete background + no concrete verbal descriptions

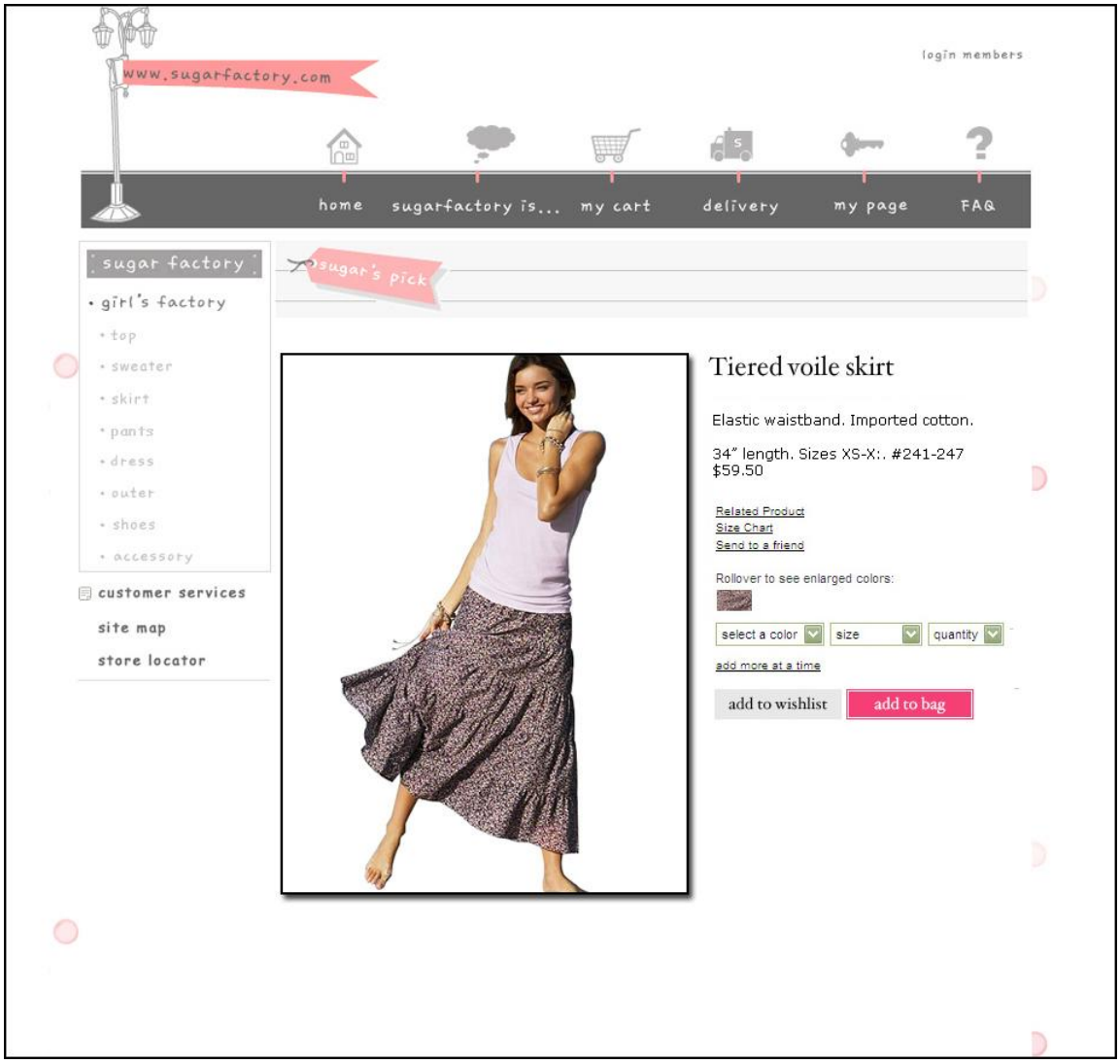
Style #1



Style #2


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
girl's factory
top
sweater
skirt
pants
dress
outer
shoes
accessory
customer services
site map
store locator
sugar's pick
Full belted voile skirt
Imported cotton voile. Self-wrap belt. Side zip.
26" length. Sizes 0-14. #240-207
$49.50
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

Style #3


www.sugarfactory.com
login members
home
sugarfactory is...
my cart
delivery
my page
FAQ
sugar factory
• girl's factory
• top
• sweater
• skirt
• pants
• dress
• outer
• shoes
• accessory
customer services
site map
store locator
sugar's pick
Tiered voile skirt
Elastic waistband. Imported cotton.
34" length. Sizes XS-X:. #241-247
$59.50
Related Product
Size Chart
Send to a friend
Rollover to see enlarged colors:
select a color
size
quantity
add more at a time
add to wishlist
add to bag

APPENDIX L

STUDY 2: QUESTIONNAIRE

SECTION 1. Please indicate how you felt when you saw the visual and read written product information on the website.

	Strongly Disagree						Strongly Agree
1. I imagined that I was actually wearing the clothes shown on the website	1	2	3	4	5	6	7
2. It was easy for me to imagine wearing the clothes	1	2	3	4	5	6	7
3. I fantasized about wearing the clothes	1	2	3	4	5	6	7
4. I could easily construct a story about myself and the clothes based on my imagination	1	2	3	4	5	6	7
5. The mental images that came to mind were very clear and specific	1	2	3	4	5	6	7
6. The mental images that came to mind formed a series of events in my mind which I was a part of	1	2	3	4	5	6	7
7. While browsing the product presentation, many images came to mind	1	2	3	4	5	6	7
8. The images that came to mind acted as a source of information about the clothes	1	2	3	4	5	6	7
9. I could actually see myself in this scenario	1	2	3	4	5	6	7

Overall, the images that came to mind while I browsed the website were								
10. dull	1	2	3	4	5	6	7	Sharp
11. weak	1	2	3	4	5	6	7	Intense
12. Unclear	1	2	3	4	5	6	7	Clear
13. Vague	1	2	3	4	5	6	7	Vivid

SECTION 2. Please indicate your emotion while you were browsing the clothes.

	Very slightly						Very Strongly
1. Amusement	1	2	3	4	5	6	7
2. Pleasure	1	2	3	4	5	6	7
3. Delighted	1	2	3	4	5	6	7
4. Joyful	1	2	3	4	5	6	7
5. Stimulated	1	2	3	4	5	6	7
6. Contented	1	2	3	4	5	6	7
7. Happy	1	2	3	4	5	6	7
8. Hopeful	1	2	3	4	5	6	7
9. Relaxed	1	2	3	4	5	6	7
10. Satisfied	1	2	3	4	5	6	7

SECTION 3. Please indicate the number of your response using the following system.

	Strongly disagree						Strongly Agree
1. I will incur some risk if I buy one of these items in the next twelve months	1	2	3	4	5	6	7
2. There is a good chance I would make a mistake if I purchase one of these items	1	2	3	4	5	6	7
3. I have the feeling that purchasing one of these items will really cause me a lot of trouble	1	2	3	4	5	6	7
4. These items are a very risky purchase	1	2	3	4	5	6	7

SECTION 4. Please evaluate this website

1.	Bad	1	2	3	4	5	6	7	Good
2.	Unpleasant	1	2	3	4	5	6	7	Pleasant
3.	Unfavorable	1	2	3	4	5	6	7	Favorable
4.	Dislike	1	2	3	4	5	6	7	Like

SECTION 5. Please indicate the number of your response using the following system.

1.	I would purchase the dress which I evaluated.							
	Unlikely	1	2	3	4	5	6	7	Likely
	Improbably	1	2	3	4	5	6	7	Probably
	Not possible	1	2	3	4	5	6	7	Possible
2.	I would be willing to pay extra in order to buy the dress.							
	Unlikely	1	2	3	4	5	6	7	Likely
	Improbably	1	2	3	4	5	6	7	Probably
	Not possible	1	2	3	4	5	6	7	Possible
3.	I would recommend the website to my friends and family.							
	Unlikely	1	2	3	4	5	6	7	Likely
	Improbably	1	2	3	4	5	6	7	Probably
	Not possible	1	2	3	4	5	6	7	Possible
4.	I would return to the website and browse it to shop for clothing item							
	Unlikely	1	2	3	4	5	6	7	Likely
	Improbably	1	2	3	4	5	6	7	Probably
	Not possible	1	2	3	4	5	6	7	Possible

SECTION 6. Please indicate the number of your response using the following system.

	Always false						Always true
1. I enjoy doing work that requires the use of words	1	2	3	4	5	6	7
2. There are some special times in my life that I like to relive by mentally "picturing" just how everything looked	1	2	3	4	5	6	7
3. I can never seem to find the right word when I need it	1	2	3	4	5	6	7
4. I do a lot of reading	1	2	3	4	5	6	7
5. When I am trying to learn something new, I'd rather watch a demonstration than read how to do it	1	2	3	4	5	6	7
6. I think I often use words in the wrong way	1	2	3	4	5	6	7
7. I enjoy learning new words	1	2	3	4	5	6	7
8. I like to picture how I could fix up my apartment or a room if I could buy anything I wanted	1	2	3	4	5	6	7
9. I often make written notes to myself	1	2	3	4	5	6	7
10. I like to daydream	1	2	3	4	5	6	7
11. I generally prefer to use a diagram rather than a written set of instruction	1	2	3	4	5	6	7
12. I like to "doodle"	1	2	3	4	5	6	7
13. I find it helps to think in terms of mental pictures when doing many things	1	2	3	4	5	6	7
14. After I meet someone for the first time, I can usually remember what they look like, but not much about them	1	2	3	4	5	6	7
15. I like to think of synonyms for words	1	2	3	4	5	6	7
16. When I have forgotten something I frequently try to form a mental "picture" to remember it	1	2	3	4	5	6	7
17. I like learning new words	1	2	3	4	5	6	7
18. I prefer to read instructions about how to do something rather than have someone show me	1	2	3	4	5	6	7
19. I prefer activities that don't require a lot of reading	1	2	3	4	5	6	7
20. I seldom daydream	1	2	3	4	5	6	7
21. I spend very little time attempting to increase my vocabulary	1	2	3	4	5	6	7
22. My thinking often consists of mental "pictures" or images	1	2	3	4	5	6	7

SECTION 7. Please answer the following questions based on your own experience.

	Never	1-6	7-12	13-18	19-24	25-30	30-
1. How often do you use Internet?	1	2	3	4	5	6	7
	Never	1-4	5-8	9-12	13-16	17-20	20-
2. How often do you browse for products online except for apparel?	1	2	3	4	5	6	7
3. How often do you browse for apparel online?	1	2	3	4	5	6	7
	Never	1-2	3-4	5-6	7-8	9-10	10-
4. How often do you purchase products online except for apparel?	1	2	3	4	5	6	7
5. How often do you purchase apparel online?	1	2	3	4	5	6	7

SECTION 8. Please check the item that best describes you.

1. Please enter your age _____

2. What is your gender?
   □ Male □ Female

3. What is your class standing?
   □ Freshman □ Sophomore □ Junior
   □ Senior □ Graduate Student □ Other (please specify) _____

4. In what college at OSU is your major?
   □ Agricultural Sciences □ Business □ Education
   □ Engineering □ Forestry □ Health and Human Sciences
   □ Liberal Arts □ Pharmacy □ Science
   □ Other (please specify) ____

6. What is your ethnicity?
   □ Caucasian □ African American
   □ Asian/ Asian American □ Hispanic American
   □ Native American □ Other (please specify) _____

APPENDIX M

STUDY 2: RESULTS

Pretest 1

Table M.1. Results of factor analysis and reliability of mental imagery measurement of each stimulus

N = 34	Items	Elaboration	Quality	Cronbach's *alpha*
stimulus 1	Item 1	.64		.89
	Item 2	.67		
	Item 3	.78		
	Item 4	.84		
	Item 5	.89		
	Item 6	.61		
	Item 7	.60		
	Item 8	.57		
	Item 9	.80		
	Item 10		.86	.94
	Item 11		.90	
	Item 12		.89	
	Item 13		.84	
stimulus 2	Item 1	.53		.95
	Item 2	.82		
	Item 3	.88		
	Item 4	.91		
	Item 5	.88		
	Item 6	.54		
	Item 7	.62		
	Item 8	.70		
	Item 9	.85		
	Item 10		.91	.97
	Item 11		.88	
	Item 12		.93	
	Item 13		.88	
Stimulus 3	Item 1	.58		.94
	Item 2	.79		
	Item 3	.80		
	Item 4	.82		
	Item 5	.87		
	Item 6	.63		
	Item 7	.77		
	Item 8	.74		
	Item 9	.84		
	Item 10		.90	.96
	Item 11		.87	
	Item 12		.86	
	Item 13		.86	

Continued

Table M.1. Continued

N = 34	Items	Elaboration	Quality	Cronbach's *alpha*
Stimulus 4	Item 1	.73		.95
	Item 2	.86		
	Item 3	.83		
	Item 4	.82		
	Item 5	.91		
	Item 6	.81		
	Item 7	.81		
	Item 8	.70		
	Item 9	.85		
	Item 10		.90	.97
	Item 11		.85	
	Item 12		.90	
	Item 13		.87	
Stimulus 5	Item 1	.59		.96
	Item 2	.76		
	Item 3	.90		
	Item 4	.75		
	Item 5	.86		
	Item 6	.76		
	Item 7	.71		
	Item 8	.69		
	Item 9	.83		
	Item 10		.83	.97
	Item 11		.89	
	Item 12		.90	
	Item 13		.88	
Stimulus 6	Item 1	.76		.96
	Item 2	.89		
	Item 3	.82		
	Item 4	.88		
	Item 5	.85		
	Item 6	.76		
	Item 7	.75		
	Item 8	.71		
	Item 9	90		
	Item 10		.91	.96
	Item 11		.90	
	Item 12		.89	
	Item 13		.90	

Continued

Table M.1. Continued

N = 34	Items	Elaboration	Quality	Cronbach's *alpha*
Stimulus 7	Item 1	.69		.97
	Item 2	.88		
	Item 3	.88		
	Item 4	.80		
	Item 5	.81		
	Item 6	.79		
	Item 7	.74		
	Item 8	.68		
	Item 9	.80		
	Item 10		.90	.94
	Item 11		.89	
	Item 12		.74	
	Item 13		.79	
Stimulus 8	Item 1	.80		.98
	Item 2	.85		
	Item 3	.92		
	Item 4	.91		
	Item 5	.91		
	Item 6	.84		
	Item 7	.78		
	Item 8	.83		
	Item 9	.91		
	Item 10		.89	.97
	Item 11		.87	
	Item 12		.91	
	Item 13		.92	
Stimulus 9	Item 1	.75		.96
	Item 2	.91		
	Item 3	.88		
	Item 4	.74		
	Item 5	.80		
	Item 6	.64		
	Item 7	.63		
	Item 8	.53		
	Item 9	.77		
	Item 10		.91	.95
	Item 11		.86	
	Item 12		.90	
	Item 13		.87	

Continued

Table M.1. Continued

N = 34	Items	Elaboration	Quality	Cronbach's *alpha*
Stimulus 10	Item 1	.81		.97
	Item 2	.88		
	Item 3	.88		
	Item 4	.88		
	Item 5	.86		
	Item 6	.79		
	Item 7	.73		
	Item 8	.75		
	Item 9	.83		
	Item 10		.86	.96
	Item 11		.90	
	Item 12		.88	
	Item 13		.90	
Stimulus 11	Item 1	.85		.97
	Item 2	.91		
	Item 3	.85		
	Item 4	.84		
	Item 5	.83		
	Item 6	.74		
	Item 7	.70		
	Item 8	.82		
	Item 9	.87		
	Item 10		.88	.97
	Item 11		.91	
	Item 12		.90	
	Item 13		.90	
Stimulus 12	Item 1	.82		.98
	Item 2	.86		
	Item 3	.86		
	Item 4	.79		
	Item 5	.92		
	Item 6	.82		
	Item 7	.69		
	Item 8	.70		
	Item 9	.91		
	Item 10		.84	.97
	Item 11		.91	
	Item 12		.88	
	Item 13		.90	

Table M.2. Descriptive statistics of mental imagery for stimulus 1 to stimulus 12

		Factor	*M*	*SD*	Min.	Max.
Stimulus 1	Concrete background	Elaboration	4.23	.88	1	7
		Quality	4.46	1.12	1	7
	Solid background	Elaboration	4.14	1.27	1	7
		Quality	5.20	1.14	1	7
Stimulus 2	Concrete background	Elaboration	4.43	1.20	1	7
		Quality	4.56	1.33	1	7
	Solid background	Elaboration	3.79	1.52	1	7
		Quality	5.36	1.06	1	7
Stimulus 3	Concrete background	Elaboration	4.84	.93	1	7
		Quality	4.98	1.12	1	7
	Solid background	Elaboration	3.35	1.44	1	7
		Quality	4.01	1.53	1	7
Stimulus 4	Concrete background	Elaboration	4.57	1.18	1	7
		Quality	4.65	1.39	1	7
	Solid background	Elaboration	4.43	1.35	1	7
		Quality	5.02	1.27	1	7
Stimulus 5	Concrete background	Elaboration	4.57	1.18	1	7
		Quality	4.74	1.19	1	7
	Solid background	Elaboration	3.85	1.53	1	7
		Quality	4.47	1.42	1	7
Stimulus 6	Concrete background	Elaboration	4.37	1.17	1	7
		Quality	4.46	1.16	1	7
	Solid background	Elaboration	3.86	1.48	1	7
		Quality	5.18	1.13	1	7
Stimulus 7	Concrete background	Elaboration	5.22	1.26	1	7
		Quality	5.38	1.26	1	7
	Solid background	Elaboration	4.27	1.43	1	7
		Quality	4.46	1.43	1	7
Stimulus 8	Concrete background	Elaboration	4.27	1.42	1	7
		Quality	4.33	1.49	1	7
	Solid background	Elaboration	3.14	1.66	1	7
		Quality	4.01	1.61	1	7
Stimulus 9	Concrete background	Elaboration	5.05	1.21	1	7
		Quality	5.10	1.35	1	7
	Solid background	Elaboration	4.65	1.30	1	7
		Quality	4.39	1.68	1	7

Continued

Table M.2. Continued

		Factor	M	SD	Min.	Max.
Stimulus 10	Concrete background	Elaboration	4.08	1.24	1	7
		Quality	4.02	1.34	1	7
	Solid background	Elaboration	4.23	1.42	1	7
		Quality	4.82	1.28	1	7
Stimulus 11	Concrete background	Elaboration	4.46	1.38	1	7
		Quality	4.34	1.45	1	7
	Solid background	Elaboration	3.80	1.57	1	7
		Quality	4.67	1.41	1	7
Stimulus 12	Concrete background	Elaboration	3.41	1.62	1	7
		Quality	3.72	1.57	1	7
	Solid background	Elaboration	2.94	1.69	1	7
		Quality	4.02	1.90	1	7

Note. Solid background condition: $N = 34$; concrete background condition: $N = 36$

Pretest 2

Table M.3. Results of descriptive statistics, factor analysis, and reliability of fashionability of three selected garments

$N = 34$	Items	Factor loading	Cronbach's *alpha*	*M*	*SD*
Style in stimulus 3	Bad - Good	.96	.96	4.82	1.39
	Unpleasant - Pleasant	.95			
	Not likable - Likable	.96			
	Unflattering - Flattering	.82			
	Unattractive - Attractive	.87			
	Not stylish - Stylish	.84			
Style in stimulus 7	Bad - Good	.97	.98	4.72	1.49
	Unpleasant - Pleasant	.93			
	Not likable - Likable	.96			
	Unflattering - Flattering	.94			
	Unattractive - Attractive	.98			
	Not stylish - Stylish	.95			
Style in stimulus 9	Bad - Good	.95	.96	4.32	1.54
	Unpleasant - Pleasant	1.00			
	Not likable - Likable	.94			
	Unflattering - Flattering	.83			
	Unattractive - Attractive	.80			
	Not stylish - Stylish	.79			

Pretest 3

Table M.4. Results of descriptive statistics, factor analysis, and reliability of six imagery evoking verbal descriptions

	Items	Factor loading	Cronbach's *alpha*	*M*	*SD*
Description 1	Item 1	.85	.94	4.19	1.35
	Item 2	.78			
	Item 3	.76			
	Item 4	.84			
	Item 5	.86			
	Item 6	.84			
	Item 7	.86			
	Item 8	.81			
Description 2	Item 1	.87	.97	4.24	1.66
	Item 2	.86			
	Item 3	.81			
	Item 4	.94			
	Item 5	.94			
	Item 6	.86			
	Item 7	.94			
	Item 8	.90			
Description 3	Item 1	.86	.97	4.50	1.56
	Item 2	.85			
	Item 3	.79			
	Item 4	.85			
	Item 5	.94			
	Item 6	.90			
	Item 7	.96			
	Item 8	.90			
Description 4	Item 1	.90	.98	3.57	1.71
	Item 2	.91			
	Item 3	.93			
	Item 4	.92			
	Item 5	.95			
	Item 6	.94			
	Item 7	.95			
	Item 8	.95			
Description 5	Item 1	.86	.98	4.55	1.50
	Item 2	.87			
	Item 3	.85			
	Item 4	.94			
	Item 5	.95			
	Item 6	.93			
	Item 7	.95			
	Item 8	.93			

Continued

Table M.4. Continued

	Items	Factor loading	Cronbach's alpha	M	SD
Description 6	Item 1	.80	.96	4.68	1.34
	Item 2	.78			
	Item 3	.79			
	Item 4	.95			
	Item 5	.95			
	Item 6	.89			
	Item 7	.91			
	Item 8	.90			

Pretest 4

Table M.5. Frequency of twenty emotional words selected from Shaver et al. (1987)

Emotional word	Frequency	Emotional word	Frequency
Amusement	24	Enjoyable	3
Relaxed	24	Zestful	5
Content	20	Exhilarating	3
Satisfied	17	Aroused	3
Delighted	16	Jittery	2
Pleasure	16	Wideawake	1
Happy	16	Frenzied	0
Hopeful	14	Calm*	3
Joyful	12	Focused*	1
Stimulated	12	Beautiful*	1
Cheerful	11	Pleased*	1
Excited	10	Comfortable*	1

Note. * Emotional words listed by participants in the open-ended question

Main Experiment

Table M.6. Factor loadings of mental imagery: two-factor solution

Item	Elaboration	Quality
The mental images that came to mind formed a series of events in my mind which I was a part of	.76	
While browsing the product presentation, many images came to mind	.75	
I could easily construct a story about myself and the clothes based on my imagination	.74	
I could actually see myself in this scenario	.71	
The images that came to mind acted as a source of information about the clothes	.71	
I fantasized about wearing the clothes	.70	
The mental images that came to mind were very clear and specific	.70	
I imagined that I was actually wearing the clothes shown on the website	.62	
It was easy for me to imagine wearing the clothes	.59	
Overall, the images that came to mind while I browsed the website were clear (7) /unclear (1)		.88
Overall, the images that came to mind while I browsed the website were vivid (7) /vague (1)		.88
Overall, the images that came to mind while I browsed the website were sharp (7) /dull (1)		.85
Overall, the images that came to mind while I browsed the website were intense (7) /weak (1)		.82

Table M.7. Results for the 16-item two-factor model for style of processing (SOP)

	Cronbach's *alpha*	Factor loading	
		Factor 1 Verbalizer	Factor 2 Visualizer
7. I enjoy learning new words	.83	.91	
17. I like learning new words		.90	
21. I spend very little time attempting to increase my vocabulary		.57	
4. I do a lot of reading		.52	
15. I like to think of synonyms for words		.50	
1. I enjoy doing work that requires the use of words		.47	
13. I find it helps to think in terms of mental pictures when doing many things	.81		.81
22. My thinking often consists of mental "pictures" or images			.71
16. When I have forgotten something I frequently try to form a mental "picture" to remember it			.67
12. I like to "doodle"			.55
10. I like to daydream			.54
2. There are some special times in my life that I like to relive by mentally "picturing" just how everything looked			.49
11. I generally prefer to use a diagram rather than a written set of instruction			.49
8. I like to picture how I could fix up my apartment or a room if I could buy anything I wanted			.45
14. After I meet someone for the first time, I can usually remember what they look like, but not much about them			.45
5. When I am trying to learn something new, I'd rather watch a demonstration than read how to do it			.43

Table M.8. Results from CFA of the respecified measurement model

	Parameter	Est.	*SE*	*t*
Path coefficient				
Elaboration → V4	λ_{11}	.81	.06	22.20***
Elaboration → V5	λ_{21}	.79	.06	21.12***
Elaboration → V6	λ_{31}	.83	.06	22.85***
Elaboration → V9	λ_{41}	.76	.07	20.08***
Quality → V10	λ_{52}	.89	.05	26.64***
Quality → V12	λ_{62}	.94	.05	29.27***
Quality → V13	λ_{72}	.94	.05	28.93***
Perceived risk → R1	λ_{83}	.71	.06	18.45***
Perceived risk → R3	λ_{93}	.90	.05	25.54***
Perceived risk → R4	$\lambda_{10,3}$	.91	.05	25.73***
Attitude toward a website → A1	$\lambda_{11,4}$	.90	.04	26.81***
Attitude toward a website → A2	$\lambda_{12,4}$	.88	.04	26.03***
Attitude toward a website → A3	$\lambda_{13.4}$	.93	.04	28.72***
Attitude toward a website → A4	$\lambda_{14.4}$	.93	.04	28.54***
Behavioral intentions → B1	$\lambda_{15.5}$	.82	.06	21.50***
Behavioral intentions → B3	$\lambda_{16.5}$	.73	.06	18.18***
Behavioral intentions → B4	$\lambda_{17.5}$	.77	.06	19.50***
Factor covariance				
Elaboration ↔ Quality	φ_{21}	.65	.03	22.52***
Elaboration ↔ Perceived risk	φ_{31}	-.12	.05	-2.43*
Elaboration ↔ Attitude toward a website	φ_{41}	.42	.04	10.93***
Elaboration ↔ Behavioral intentions	φ_{51}	.63	.04	18.11***
Quality ↔ Perceived risk	φ_{32}	-.14	.05	-3.06**
Quality ↔ Attitude toward a website	φ_{42}	.44	.04	11.94***
Quality ↔ Behavioral intentions	φ_{52}	.58	.04	16.37***
Perceived risk ↔ Attitude toward a website	φ_{43}	-.37	.04	-9.42***
Perceived risk ↔ behavioral intentions	φ_{53}	-.35	.05	-7.71***
Attitude toward a website ↔ Behavioral intentions	φ_{54}	.71	.03	25.69***
Error covariance				
$\delta_{12} \leftrightarrow \delta_{14}$	$\theta_{\delta 12,\ 14}$	-.08	.01	-5.47***
$\delta_{16} \leftrightarrow \delta_{17}$	$\theta_{\delta 16,\ 17}$	.38	.07	5.32***
Model fit				
Chi-square		170.56	(*df* = 107)	
RMSEA		.033	90% C. I. (.023; .042)	
TLI		.99		
NFI		.98		
CFI		.99		
IFI		.99		

APPENDIX N

HUMAN SUBJECT APPROVAL FORM

TO: Minjeong Kim
Design and Human Environment

IRB #: 4249 – Website design and consumer responses for apparel shopping
(Student Researcher: Jungmin Yoo)

Level of Review: Exempt
Expiration Date: 3-30-10
Approved Number of Participants: 6000

The referenced project was reviewed under the guidelines of Oregon State University's Institutional Review Board (IRB). The IRB has **approved** the:
(X) Initial Application ( ) Continuing Review ( )

Project Revision ***with a (if applicable)***:
(X) Waiver of documentation of Informed Consent ( ) Waiver of Consent

A copy of this information will be provided to the full IRB committee.

- **CONSENT FORM:** All participants must receive the IRB-stamped informed consent document. If the consent is in a format that could not have stamp placement (i.e. web site language, email language, etc), then the language must be **exactly** as the IRB approved it.
- **PROJECT REVISION REQUEST:** Any changes to the approved protocol (e.g. protocol, informed consent form(s), testing instrument(s), research staff, recruitment material, or increase in the number of participants) must be submitted for approval before implementation.
- **ADVERSE EVENTS:** Must be reported within three days of occurrence. This includes any outcome that is not expected, routine and that result in bodily injury and/or psychological, emotional, or physical harm or stress.
- **CONTINUING REVIEW:** A courtesy notice will be sent to remind researchers to complete the continuing review form to renew this project, however – it is the researcher's responsibility to ensure that continuing review occurs prior to the expiration date. Material must be submitted with adequate time for the office to process paperwork. If there is a lapse in approval, suspension of all activity including data analysis, will occur.
- **DEVIATION/EXCEPTIONS:** Any departure from the approved protocol must be reported within 10 business days of occurrence or when discovered.

Forms are available at: http://oregonstate.edu/research/ori/humansubjects.htm.

If you have any questions, please contact the IRB Human Protections Administrator at IRB@oregonstate.edu or by phone at (541) 737-8008.

Elisa Espinoz

Date: 3-31-09

Elisa Espinoza
IRB Human Protections Administrator