

## AN ABSTRACT OF THE DISSERTATION OF

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Title: When More Is Less: Consumer Attitude Formation When Facing Choice Overload In Apparel E-Commerce

Abstract approved: \_\_\_\_\_

Leslie Davis Burns

This study proposed a theoretical model of choice overload and empirically examined the model in the context of online apparel shopping. The purpose of the study was to investigate how the number of choices and product presentation formats influenced consumers' online apparel shopping experience as well as how the formed attitude subsequently influenced consumers' behavioral decision of subscribing to an email mailing list. To date, previous studies on choice overload have been conducted using experimental research designs, but findings from these experiments only provide fragmentary explanations about the phenomenon. The absence of a comprehensive framework to explain this phenomenon motivated the researcher to develop a theoretical model that treats consumer decision making in choice overload conditions as a continuous process. The proposed theoretical model is superiorly explaining under what circumstances the "too-much-choice effect" is more likely to occur, what evaluation mechanism consumers go through to form their attitude, and what consequences may result. Additionally, the researcher examined the effect of a moderator, product presentation format, on the relationships between the numbers of choices and the internal responses (attitude formation) in the context of apparel e-commerce.

Both focus group and questionnaire data collection methods were conducted. First, because of the limited literature on choice overload in e-commerce, the researcher conducted an exploratory study consisting of two focus groups with female college

students. The purpose of the focus groups was to understand the relationship between choice overload and consumers' apparel online shopping experience, such as favorable and unfavorable shopping experiences as well as website designs/navigations. Next, questions were developed that measured consumers' affective, behavioral, and cognitive evaluative responses (three components of attitude) when facing choice overload. In this stage of data collection, an online questionnaire with nine conditions (mock websites) was developed. The experimental design was a 3 X 3 factorial design with three levels of number of choices (24 vs. 60 vs. 120) and three levels of product presentation formats (Model vs. Flat vs. Hybrid). To examine the main and interaction effects, two-way Analysis of Covariance (two-way ANCOVA) was conducted. The Structural Equation Modeling (SEM) and Logistic SEM were applied to examine the hypothesized relationships among the number of choices, components of internal responses/attitude formation, and the behavioral decision variable (subscribing to a mailing list) in the proposed model.

The findings revealed that consumers went through a series of stages to generate their behavioral decision when facing choice overload. Their internal responses followed the experiential hierarchy in the ABC model of attitudes to form their attitude (affective → behavioral → cognitive responses). The attitude formed had a substantial impact on their behavioral decision of signing up for the retailer's email mailing list. However, product presentation had no effect on attitude formation (internal responses).

The findings of this research study provide insights to the attitude formation process in consumers' evaluation stage of decision-making. Researchers are encouraged to apply the model in different contexts to examine the generalizability of the model. These findings also provide further understanding of the interrelationship of factors underlying consumers' negative responses in their online shopping experiences when facing choice overload. In addition, the present research study provided further information on consumer attitude formation and behavioral decision when faced with multiple product choices.

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When More Is Less: Consumer Attitude Formation  
When Facing Choice Overload In Apparel E-Commerce

by  
Tsun-Yin (Tracie) Tung

A DISSERTATION

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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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Tsun-Yin (Tracie) Tung, Author

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## CHAPTER 1

### INTRODUCTION

General models of consumer behavior typically indicate that the consumer decision process consists of five stages: problem recognition, search, alternative evaluation, choice, and outcome. During the stage of evaluating alternatives, consumers commonly conduct an information search that helps them make decisions. However, information overload may take place while collecting product information and subsequently result in a poor decision (Engel, Blackwell, & Kollat, 1978). In line with the significant impact of information overload on consumer behavior, Iyengar and Lepper (2000) found a different way of thinking about this concept. Information overload can merely happen while being presented with too many choices in one product category, which is referred to as the phenomenon of “choice overload” or the “too-much-choice effect.”

In marketing practices, marketers tend to provide abundant alternatives to consumers because such abundance increases the likelihood of matching different needs and interests of various consumers (Haynes, 2009). In his book, *The paradox of choice: Why more is less*, Schwartz (2004) noted that in a supermarket one could find 285 varieties of cookies, 275 varieties of cereal, 175 salad dressings, 120 pasta sauces, 85 different juices, 75 ice teas, and so on. However, many times the result of offering such a large product assortment is good neither for the company nor for the consumers. In fact, researchers have noted that extensive choices can result in negative consequences for the

consumer (e.g., choice dissatisfaction) or for the company (e.g., the consumer deferring her decision to choose) (Chernev, 2003; Iyengar & Lepper, 2000; Schwartz, 2004). Moreover, while having more choice seems to implicitly be associated with more freedom and the feeling of autonomy, researchers have noted that providing extensive choices on the 401(k) plans did not help employees optimize their salary investments (Iyengar, Huberman, & Jiang, 2004; Schwartz, 2004). Schwartz referred to the too-much-choice effect as “the paradox of choice” or “the tyranny of choice,” implying that it may lead us to less satisfactory choice decisions due to choice overload.

However, negative consequences of the too-much-choice effect are not observed consistently. Scheibehenne, Greifeneder, and Todd (2010) conducted a meta-analytic literature review of choice overload and concluded that no reliable conditions were found to be able to explain why the large choice set would decrease satisfaction and other observed outcomes. Based on Schwartz (2004), one of the explanations may be that facing a large choice set has become a part of our lifestyle. People live in a world that is full of choice. For instance, which health insurance plan does one choose? What kind of car does one buy? Where does one choose to go for the Thanksgiving holiday? There are literally hundreds of situations that could result in the too-much-choice effect. As a result, consumers may have developed different strategies to handle the situation. The other explanation may be the fact that due to various situations that could result in the too-much-choice effect, outcomes of the effect are influenced by moderators (Scheibehenne et al., 2010).

To explain the inconsistent results, the researcher reviewed the existing findings from related literature and developed a theoretical model that demonstrated the

interrelationships among large assortments and other factors, such as moderators, internal responses, and behavioral decisions. To test the proposed model, the researcher applied the model in the context of online apparel shopping and utilized apparel websites as stimuli to investigate the relationships. The Internet has been a convenient platform that offers extensive product information and alternatives, which escalates the cognitive effort of a consumer in processing the product information. As such, it may increase the likelihood of a consumer experiencing choice overload. Consequently, understanding the impact of consumers' cognitive overload and consumers' attitude formation that may lead to negative behavioral decisions is important for online marketers. As a result of this work, online marketers may be able to more efficiently optimize consumers' online experiences.

Furthermore, to date, most researchers have used experimental designs, but findings from experiments only provide fragmentary explanations about the too-much-choice phenomenon. The researcher developed a theoretical model that illustrates the consumer decision process within a condition of choice overload as a continuous process. Whereas many empirical studies presented the statistically significant results between the number of choices and negative outcomes, the researcher argues that when facing choice overload, consumers undergo a hierarchical process of attitude formation. The researcher referred to attitude formation in the model as *internal responses*. Once attitudes are formed, they would then influence consumers' *behavioral decisions*. The theoretical model better explains under what circumstances the too-much-choice effect is more likely to occur, what evaluation mechanism consumers go through to form their attitude, and the resulting consequences. Additionally, the researcher examined the effect of a

moderator, product presentation format, on the relationships between the numbers of choices and the attitudinal responses.

### **Statement of Problem**

E-commerce websites provide marketers with the opportunity to present numerous images of products to consumers. Although e-commerce websites offer means to filter the products seen by consumers (e.g., brand, product category, product attributes) or change the organization of the products seen by consumers (e.g., number of products visible at any one time), these filters are more efficient for consumers who are shopping for a particular product and know the product's attributes. More often, consumers take a fair amount of time to browse e-commerce websites with no particular attributes of a product in mind. Thus, the large amount of product information presented to consumers may lead to information and/or choice overload.

Additionally, previous studies of choice overload have focused on the relationship between the number of choices and negative responses and behavioral decisions. Most have overlooked a) the internal processes (attitude formation) that may occur when consumers are exposed to the stimuli and b) the relationship of formed attitudes with consequent behaviors. Therefore, the present study will fill this gap in the existing literature by exploring the process by which internal responses occur when consumers are faced with choice overload within the context of apparel e-commerce.

### **Purpose of the Study**

The purpose of the study was to test empirically a theoretical model of choice overload in the context of online apparel shopping. More specifically, the researcher aimed to investigate the hierarchical effect of attitude formation (internal responses) resulting from large choice sets and the resulting impact on consumers' behavioral decisions.

### **Research Questions**

In line with the purpose of the study, the research questions were as follows:

- 1) Does the number of products presented on an e-commerce web page influence consumers' internal responses/attitude formation?
- 2) What is the mechanism of attitude formation (affective, behavioral, and cognitive responses) consumers go through when facing choice overload?
- 3) Do attitudes formed influence consumers' actual behaviors (subscribing to a mailing list)?

### **Research Hypotheses**

H<sub>1</sub>: Affective (H<sub>1a</sub>), behavioral (H<sub>1b</sub>), and cognitive responses (H<sub>1c</sub>) (internal responses/attitude formation) will vary as a function of number of choices.

H<sub>2</sub>: Affective (H<sub>2a</sub>), behavioral (H<sub>2b</sub>), and cognitive responses (H<sub>2c</sub>) will vary as a function of the interaction between number of choices and format of product presentation.

H<sub>3</sub>: Affective, behavioral, and cognitive responses will exhibit a hierarchical relationship.

H<sub>4</sub>: Consumers' behavioral decisions (subscribing to an email mailing list) will vary as a function of the internal responses/attitude formation.

### **Definitions of Terms**

#### *Affective Response*

It refers to “an emotional response, a gut reaction, or sympathetic nervous activity” (Breckler, 1984, p. 1191).

#### *Attitude*

It refers to “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chailen, 1993, p. 1).

#### *Behavioral Decision*

It refers to the “consequences” in the proposed model. It is a decision made after or an actual behavior resulting from the internal evaluative process.

#### *Behavioral Response*

It refers to “overt actions, behavioral intentions, and verbal statements regarding behavior” (Breckler, 1984, p. 1191).

#### *Choice Overload*

It refers to the mental status when a consumer is giving too many options in which a person cannot conduct proper evaluation to compare every option because of the cognitive overload. The effect resulting from choice overload is referred to a too-much-choice effect in this study.

### *Cognitive Response*

It refers to “overt actions, behavioral intentions, and verbal statements regarding behavior” (Breckler, 1984, p. 1191).

### *Consequence*

It is one of the components of the proposed theoretical model in this present study. The researcher refers to it as the behavioral decisions/outcomes resulting from the internal responses. This concept focuses on the behavioral decisions after the evaluative stage of the decision making process (e.g., not purchase anything, repurchase, word of mouth, sign up for an email mailing list, post-purchase dissatisfaction, and so on).

### *Interface Consistency*

Interface consistency is made up of three senses, a) internal consistency of an interface design, b) external consistency of interface features with features of other interfaces familiar to the users, and c) correspondence of interface features to familiar features of the world beyond computing (Grudin, 1989).

### *Internal Response*

It is one of the components of the proposed theoretical model in this present study. It refers to the psychological reaction or evaluative response that forms the attitude while facing too much choice. The responses could be positive or negative responses. According to the theory of attitude formation, the responses belong to three classes, affective, behavioral, and cognitive (Breckler, 1984; Eagly & Chaiken, 1998).

### *Main Effect*

It is one of the components of the proposed theoretical model in this present study. It refers to the specified context, the large choice set condition, which results in negative impacts on and counterintuitive results of the decision-making process.

### *Moderator*

It is one of the components of the proposed theoretical model in this present study. It refers to any factors that might interfere with the occurrence of the effect. These moderators may mitigate or aggregate the too-much-choice effect.

### *Online Visual Merchandising*

Visual merchandising is defined as a strategic presentation of a company and its products that attracts consumers and facilitates purchasing (Diamond & Diamond, 2007). Online visual merchandising refers to the same concept within a specified online context.

### *Product Presentation Format*

It is a strategy of online visual merchandising. It refers to the overall look of the organization of the images of products. The products can be displayed on a human model or by itself, flat. Thus, the three possible combinations of the overall look focused in this study consist of a) all models, b) all flats, and c) a hybrid format (mixing images of models and flats).

### *Too-Much-Choice Effect*

It also refers to the “paradox of choice” or the “tyranny of choice.” When facing too much choice, a person is not able to conduct proper evaluation and compare

every option because of the cognitive overload. As a result, she develops negative response (e.g., an aversion) towards the choice and the decision making process as well as tend to search for heuristic short cuts to ease the choice-making process. It is the consequence resulting from choice overload.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **Choice Overload and the Too-Much-Choice Effect**

Life has become a matter of choice (Schwartz, 2004). What kind of car should one buy? Which restaurant should one pick for the family reunion? What courses should a college student take? As noted by Schwartz (2004) compared to 30 years ago, the university curriculum has greatly expanded. The small college where he teaches, with only 1,350 students, offers about 120 courses to meet the college version of the general-education requirement. At Pennsylvania State University, liberal arts students can choose from hundreds of courses in order to meet basic requirements. He proposed that increased choice might lead to decreased well-being. He referred to the too-much-choice phenomenon as “the paradox of choice” or “the tyranny of choice,” which leads people to a less happy life. He further elaborated his perspective with the university curriculum example. With the freedom of choice, the downside was that students are forced to make choices on what kind of person they want to be while they are still trying to figure out what kind of life they want.

While assuming that people make rational decisions based on the information obtained, researchers found that adding more options may not always result in positive outcomes (Iyengar & Lepper, 2000; Simenson & Tversky, 1992; Tversky & Shafir, 1992). In fact, adding more options might be less attractive to people (Beattie, Baron, Hershey, & Spranca, 1994). In contrast to the classic economic and psychological theory whereby the more choice the better, a series of studies using field observation and lab

experiments conducted by Iyengar and Lepper (2000) concluded that having too much choice may be demotivating. In their classic study on choices of jams, conducted in an upscale grocery store, they found that when displaying 24 different exotic jams (the larger choice set) at the sample booth in the store, only three percent of the sampling shoppers actually purchased one of the jams. On the other hand, 30 percent of the sampling shoppers purchased the jams with the display of six jam samples (the smaller choice set). Furthermore, in their subsequent experiment on choices of chocolate, they also found that those who were offered fewer options were more likely to purchase the chocolate and expressed higher satisfaction with their decision.

The too-much-choice effect has been observed not only in the supermarket or in food-related projects but also in the educational context (Iyengar & Lepper, 2000). Students in a social psychology course were given an extra-credit opportunity of writing an essay about a movie. Essay topics were provided (either 6 essay topics or 30 essay topics) and students were asked to pick one topic out of the list. In addition, students were reminded that the essay would not be graded. Two graduate students evaluated the quality of essays turned in by students. The researchers found that the quality of essays was significantly better in the limited-choice condition (6 essay topics) than in the extensive-choice condition (30 essay topics).

Additional negative outcomes that result from having too many choices in our lives have been confirmed in a number of other research studies. Iyengar et al. (2004) found that the more 401(k) retirement plans the employer provided to employees, the less likely employees were to invest in any. The lower adoption rate of retirement investment

plans resulted in the employer saving several thousand dollars of employer-matching funds per year.

Furthermore, Schwartz et al. (2002) identified that personal characteristics may interact with the too-much-choice effect. Maximizers (who tend to collect more information to find the best/optimal option) were more likely to feel less satisfied with their purchases than satisficers (who just wanted to find something that was good enough). Along with this research stream, Iyengar, Wells, and Schwartz (2006) conducted a study of the job search process of college seniors and found that those students who sent out more resumes, searched for more fields, and went on more job interviews (maximizers) got better jobs. However, they were less satisfied with the jobs and more stressed as well as unhappy with the job search process. The potential negative outcomes of the too-much-choice effect examined by related research studies also included frustration, dissatisfaction, post-choice regret, post-choice dissatisfaction, ambivalence about choice outcomes, choice deferral, less motivation to choose, etc. (Chernev, 2003; Greifeneder et al, 2010; Haynes, 2009; Iyengar, Huberman, & Jiang, 2004; Iyengar & Lepper, 2000; Oulasvirta et al., 2009; Shah & Wolford, 2007).

As the body of research on choice overload and the too-much-choice effect has grown in different areas, consumer behavior researchers have followed two research directions: a) the impact of variation of number of choices on outcome behaviors in different contexts (Reutskaja & Hogarth, 2009; Shah & Wolford, 2007) and b) the impact of moderators that could mitigate or aggregate the too-much-choice effect (Chernev, 2003; Haynes, 2009; Scheibehenne, Greifeneder, & Todd, 2009).

The first direction has focused on understanding the specific number of choices that constitute “choice overload.” However, no definitive conclusions as to what constitutes choice overload have been drawn. The numbers of choice sets manipulated by the researchers varied (e.g., 4 vs. 16, 6 vs. 24, 6 vs. 30, and 5 vs. 30) (Chernev, 2003; Iyengar & Lepper, 2000; Jessup, Veinott, Todd, & Busemeyer, 2009; Scheibehenne et al., 2009). Most of the researchers used two choice sets, small vs. large, to test their hypotheses (Chernev, 2003; Greifeneder, Scheibehenne, & Kleber, 2010; Iyengar & Lepper, 2000). Shah and Wolford (2007) argued that giving more options does not always lead to less buying. Their study demonstrated an inverted U-shaped relationship between the number of choices and the outcome variable of buying behavior. In their study of number of choices of pens offered to consumers, the number of choices varied from two to 20 in increments of two. The results showed buying behavior as a curvilinear function of the number of choices. Buying behavior reached its peak when 10 pens were offered to participants. However, they concluded that the shape and the peak of the reverse curve might vary based on the product. Reutskaja and Hogarth (2009) also identified a reverse U-shaped relationship in their study of choice satisfaction. They concluded that choice satisfaction was a reverse U-shaped function of the numbers of choices.

The second research stream has focused on examining the moderators in the too-much-choice effect. The consumer decision process may be affected by factors such as personality, motivations, product evaluations, and unanticipated circumstances (Engel et al., 1978). In addition, given the fact that choice overload is a context-specific phenomenon, researchers have investigated factors that might affect its occurrence or

magnitude in different circumstances (Chernev, 2003; Greifeneder et al., 2010; Haynes, 2009; Iyengar & Lepper, 2000; White & Hoffrage, 2009). Studies have identified a number of moderators that influence the relationship between the number of choices and negative outcomes, such as personalities (maximizing), choice justification, propensity to regret, decision strategies, time pressure, and difficulty of trade-offs (Broniarczyk, 2006; Scheibehenne et al., 2010). These empirical studies have shown that the too-much-choice effect occurs in different contexts (e.g., charity donation, prize drawing, and essay topics) or with various product categories (e.g., mp3 players, pens, chocolates, and gift boxes).

However, the too-much-choice effect has not been consistently observed in all contexts. Scheibehenne, Greifeneder, and Todd (2009) conducted a series of studies and did not find a statistically significant relationship between number of choices (small vs. large) and the percentage of the participants who made a choice in a variety of contexts: restaurant-selection task, charity donation task, and music CD-selection task. Studies were conducted in both Germany and United States (except for when German participants were asked to justify their choice in one of the charity tasks). Moreover, they did not find any interactions with any of the tested moderators. In their studies, consumers' decision-making was not influenced by the sizes of the product assortment they faced; consumers in the larger assortment condition did not show significantly a higher deferral rate in making their choice compared to those in the smaller assortment group. They also did not find any moderators that mitigated or augmented the too-much-choice effect. Therefore, they suggested a need for a theory of the too-much-choice effect that explains these divergent findings.

### **Motivation of Model Development**

Due to the inconsistencies in research findings, researchers have been trying to provide a comprehensive analysis to explain the too-much-choice effect. Two academic works that focused on providing a holistic picture of the effect have been identified. Both works summarized a number of moderators that interfere with the effect. Scheibehenne et al. (2010) conducted a meta-analytic review of the effect with a review of 50 published and unpublished experiments. They adopted a statistical approach that examined the distribution and mean of effect sizes across studies. They found a mean effect size of zero and indicated there was considerable variance among studies. They concluded that there were a number of preconditions for choice overload and no sufficient condition could be identified in their analysis. Therefore, moderators proposed in different studies may be the key factors in reliably explaining the occurrence of the too-much-choice effect in specific circumstances.

The second academic work is the chapter, “Product Assortment,” in a handbook of consumer psychology by Broniarczyk (2006). Broniarczyk provided a full discussion of the too-much-choice phenomenon by reviewing a number of related studies. In her work, she categorized negative outcomes of large product assortment into “lower choice accuracy,” “lower decision satisfaction,” “lower product satisfaction,” “greater product regret,” and “greater choice avoidance.” Furthermore, she identified four categories of moderating factors, “assortment perceptions,” “assortment attribute type,” “consumer preference development,” and “consumer maximizer-satisficer tendency.”

Although these two works presented a number of moderators and potential outcomes of the too-much-choice effect, they both focused on only one or two parts of the effect. The researcher of the present study proposed that the effect of choice overload would be better explained by taking the parts into consideration as a whole. That is, the researcher proposed that the inconsistent findings might result from not only the moderators that mitigate or augment the effect but also the absence of the “internal responses” that form a person’s attitude while facing choice overload. The formation of the attitude represents another key element that further influences a consumer’s responses towards the brand and/or the product (Solomon, 2013).

### **Proposed Theoretical Model of the Too-Much-Choice Effect**

In this section, the researcher of the present study presents a proposed theoretical model that serves as the center of this dissertation. Based on a review of literature, the model developed can be decomposed into four elements: the main effect, internal responses, consequences, and moderations (Figure 1). The first element, main effect, specifies the context, the large choice set condition, which leads to internal responses and consequentially impacts the decision-making process. The second element in the model is the “internal responses.” This part of the model shows the psychological reactions or evaluative responses that form the attitude while facing too much choice. The responses could be positive or negative. According to the theory of attitude formation, the responses could belong to three classes, affective, behavioral, and cognitive (Breckler, 1984; Eagly & Chaiken, 1998). For instance, consumers tend to feel more enjoyment while facing a

large assortment; however, it may also be tinged with negative responses, such as decision difficulty and intention to give up on choosing.

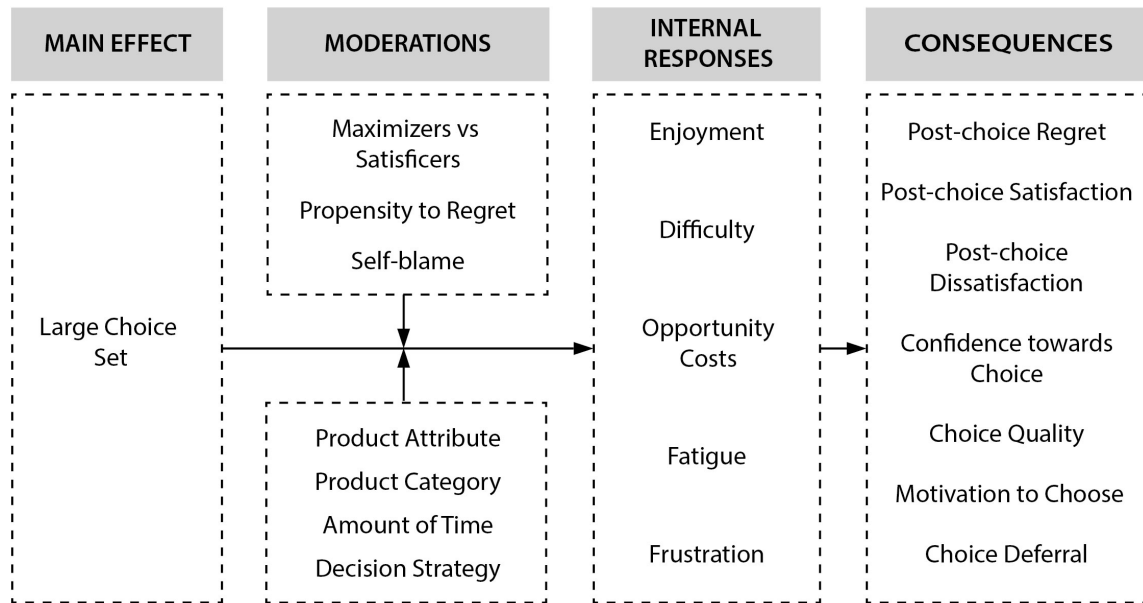


Figure 1 The proposed model of the too-much-choice effect (Adapted from Tung & Burns, 2014).

Researchers have shown that the possible internal responses include the feeling of enjoyment, frustration, difficulty, and fatigue (Figure 1). When evaluating the given options, the effect related to “opportunity costs” may occur as well. The definition of opportunity cost is given as “one of the costs of any option involves passing up the opportunities that a different option would have afforded” (Schwartz, 2004, p. 120). It is associated with the uncertainty of making decisions, anticipated regret, trade-offs, and increased expectation (Oulasvirta, Hukkinen, & Schwartz, 2009; Schwartz, 2004; White & Hoffrage, 2009). This section, internal responses, is the core of the model which transforms the stimuli (i.e., in this study: “number of choices”) to the behavioral and

psychological consequences. Its existence is proposed to help explain why in some cases the too-much-choice effect occurred and in some cases it did not.

The third element is the “consequences.” In this study, the researcher refers to it as the outcomes resulting from the internal responses. This concept focuses on the actual behaviors or attitudes formed after the evaluative stage of the decision making process. Previous studies of the too-much-choice effect have emphasized the impact of the number of choices on the selected dependent variables that were either the internal responses that occurred during the evaluation stage or the attitude or behavior after the decision-making process was completed (Figure 2). In the present study, the researcher not only examines the internal responses that help form the attitude towards the choice in the specific context of apparel e-commerce but also proposes that those dependent variables in the previous studies exhibit a hierarchical relationship. Among the dependent variables, some of them are the internal responses, and some of them are the consequences (Figure 3).

The last element of the model is the component of “moderators.” Given the fact that choice overload is a context-specific phenomenon, many factors might interfere with the occurrence of the effect (Chernev, 2003; Greifeneder et al, 2010; Haynes, 2009; Iyengar & Lepper, 2000; White & Hoffrage, 2009). Based on selected literature, the moderators that influence the relationship between the main effect and the internal responses are personality-driven (e.g., maximizers, self-blame, and propensity to regret), product attributes (e.g., attribute complexity), product category, amount of time to make decisions, and strategies used to manage the large number of choices. These moderators may mitigate or aggravate the too-much-choice effect. While companies want to provide

many options to consumers to better match individual preferences, the proposed model shows that having too many options results in choice overload and being overwhelmed by information quantity, subsequently leading to negative outcomes in consumers' decision-making process. The magnitude of the effect may be mitigated or aggravated by moderators as illustrated in Figure 3.

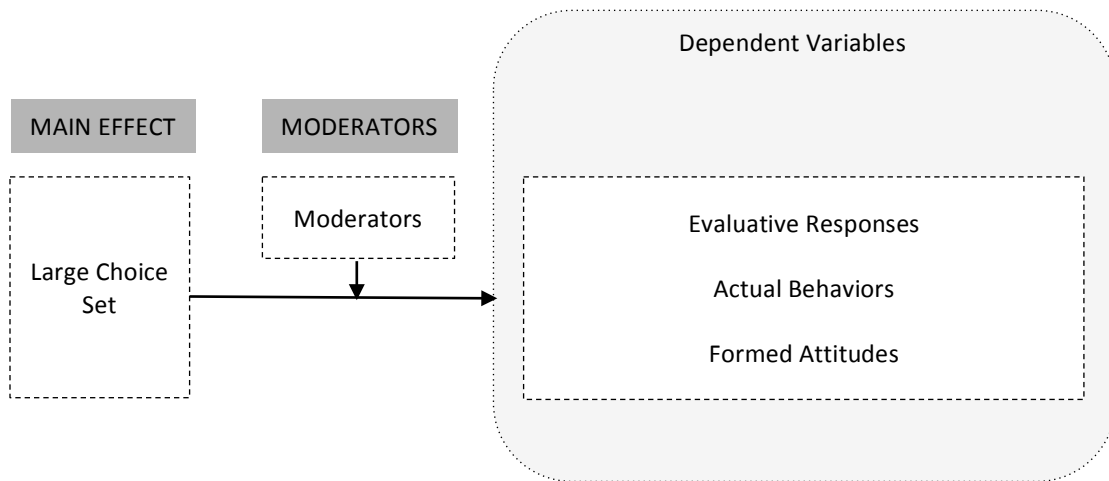


Figure 2 The Mechanism of Choice Overload Discovered in Previous Studies

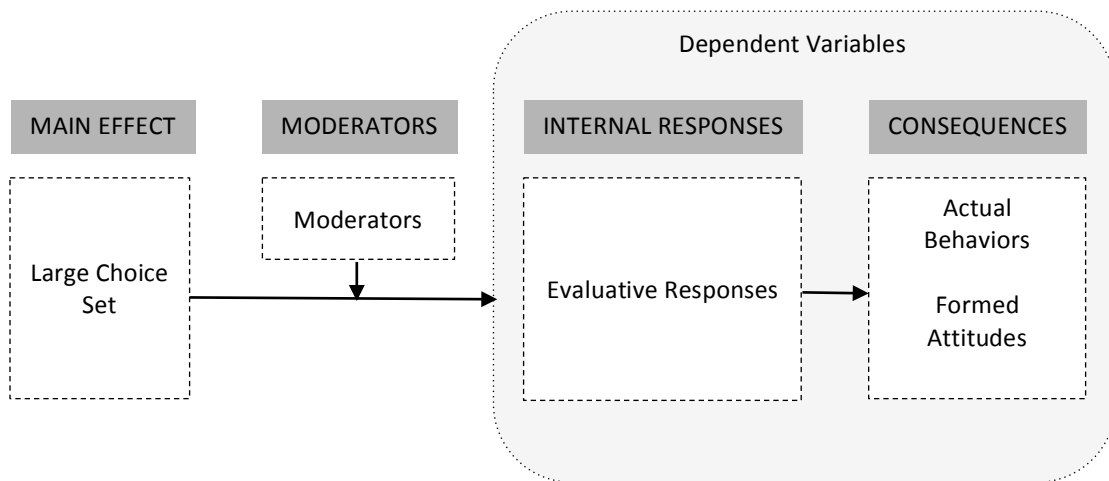


Figure 3 The Mechanism of Choice Overload in the Present Study

To summarize, the proposed model presents the following mechanism of the too-much-choice effect. Before the large choice set (the main effect) generates influences on those outcome variables (consequences), a person would go through an attitude formation stage (internal responses) and at the same time other factors (moderators) may have an impact on the magnitude of the relationship between the components of the number of choices and internal responses. As a result, when studying choice overload, it is imperative to consider the sections of moderators and internal responses as well as their relationships with the main effect and consequences as a whole in order to better explain consumers' behaviors.

### **Choice Overload and the Too-Much-Choice Effect in Apparel E-Commerce**

**Visual merchandising.** The researcher of the present study posited that the likelihood of the too-much-choice effect rises when consumers face the large number of products displayed on a website, such as 80 or 100 products. In the online environment, because of the lack of the capacity to physically examine products, consumers rely on the images and description of products to make their choice decision. Because online visual presentation plays a substantial role in the success or failure of a product in the web context, visual merchandising has drawn much attention among researchers (Ha & Lennon, 2010; Im, Lennon, & Stoel, 2010). Visual merchandising (VMD) is a strategic presentation of a company and its products that attracts consumers and facilitates purchasing (Diamond & Diamond, 2007).

Visual merchandising is crucial to apparel products. Clothing is known as an “experience” product that usually requires haptic and actual fit examinations before making a purchase. Due to the absence of the actual examination in online retail environment, consumers pay more attention to other cues, such as product images and descriptions, in order to better evaluate the product (Eroglu, Machleit, & Davis, 2003). Clothing is also a product that satisfies our hedonic needs. The image on the website is a strong medium to evoke consumers’ excitement and fantasy to different lifestyles. Consumers may have also developed their preferred online visual presentations or browsing strategies which help facilitate their choice making in online apparel shopping. To optimize consumers’ shopping experience and make the navigation easier for a product search, many features have been developed for apparel e-commerce websites. For example, apparel products can be categorized by consumer segments (i.e., women, men, and baby) and under each consumer segment, products can be classified based on product category, such as tops, dresses, and pants. These category labels help consumers find products they want. Some retailers, such as Forever 21 and Urban Outfitters, are known for an extensive product assortment. Thus, filtering options (i.e., sort by price, color, and size) have become essential features on such websites to help consumers quickly narrow down their choices.

Websites have also provided features that increase consumers’ interactivity with the web interface. Consumers can customize the number of products displayed on one page to meet their information processing preference. There are several types of browsing options available. Consumers can choose to view, for example, “24,” “30,” or “100” different numbers of products or view all on one web page. Some retailers provide a

“quick view” window that allows consumers to obtain quickly essential information of the product without changing the page.

In the current online retail environment, apparel product images are displayed in several formats. Some retailers use mannequins, some use the flat method (the clothes are presented as flat objects), and others use human models to display apparel products (Figure 4). Several research studies have been conducted to investigate consumers' preferences of product presentation formats. Kim, Kim, and Lennon (2009) conducted an experimental research study with 272 female college students and found that the consumers preferred to see apparel products displayed on human models rather than as flats. Displaying an apparel product on a human model helps consumers to better assess the dimension of the product, such as length and shape of the garment. Furthermore, there are several different ways of displaying products on human models, (a) showing the body (whole coordination) with the model's face, (b) showing the body (whole coordination) without the model's face, and (c) showing only the top of the model. Shoppers seemed to prefer to see the first presentation style listed above (a), a well-coordinated combination display of the featured product with a complementary item on a human model (Yoo & Kim, 2012). The presence of an attractive model's face was also found to increase consumers' pleasure and arousal experience compared to the absence of a model's face (Yoo & Kim, 2012).

Whereas different features for organizing product information are built into websites to facilitate consumers' website experience, some of the features might not sufficiently satisfy consumers' needs. For example, sorting features are not always useful. They appear to be most useful when a consumer knows product attributes he/she wants,

but shoppers often browse websites without knowing what product attributes they want. Whereas consumers seem to be in favor of the “view all” function which allows them to quickly browse all the products, the “view all” function may tend to result in the too-much-choice effect and result in consumers experiencing choice overload.



Model



Flat

Figure 4 Examples of Online Apparel Presentation Format

**Product presentation formats and choice overload.** Although studies of apparel online visual presentation have provided the fundamental understanding of consumers’ perception towards different apparel presentation formats (Kim et al., 2009; Yoo & Kim, 2012), they only focused on evaluating the presentation formats of a single item. However, when exploring apparel options online, consumers are usually exposed to a number of thumbnail images of product images. For presentations of a single-item in the current market practice, an apparel product may be displayed on a human model, mannequin, hanger, or flat (Kim et al., 2006). Thus, product presentation formats for a number of apparel products (thumbnails) on a web page could have the following two possibilities: a) all are in a consistent look (i.e., all on human models or all flats) or b) in a hybrid fashion (i.e., human models mixed with flats). Although consumers’ attitude

towards a single product's display has been examined in several research studies, the impact of different product display formats as combinations for a number of apparel products has not been examined.

Most of the apparel e-commerce websites, especially for women's apparel, display their products on human models and show a consistent product presentation format to provide a unified look to the web page and to meet consumers' preferences (Yoo & Kim, 2012). However, due to budget or time limitations, apparel retailers may apply a hybrid format that mixes the images of human models and flats. Taking choice overload and interface consistency theory (see details in the next section) into consideration, the researcher hypothesized that not only would an extensive number of thumbnails on a web page result in consumers exhibiting a less favorable response towards the choice and retailer but also presenting the thumbnail images in a hybrid format (inconsistency) would aggravate the effect. The following section includes the rationale for this proposition as well as the theoretical justification drawn from the literature on interface consistency.

**Product presentation formats and interface consistency.** Interface consistency has been deemed an important aspect of usability in designing user interface (Nielsen, 1989). It leads to a number of advantages from the vantage points of both users and companies. According to Nielsen (1989), improving the interface consistency can lead to ease of learning, ease of use, fewer errors, and higher user satisfaction. This is because it enables users to predict the system based on common rules observed by users. For

companies, interface consistency leads to lower costs and time for training because the personnel can apply their previous knowledge to learning the new application.

Interface consistency, however, is difficult to define (Grudin, 1989; Nielsen, 1989). The discussion provided by Grudin (1989) offered an overall introduction of the concept. He proposed that interface consistency was used in the following three senses, a) internal consistency of an interface design, b) external consistency of interface features with features of other interfaces familiar to the users, and c) correspondence of interface features to familiar features of the world beyond computing. Thus, interface consistency is a multifaceted concept that includes consistency among internal designs, consistency among applications, and consistency among fields. As a result, it is difficult to quantify levels of interface consistency.

In the context of e-commerce web page designs, Ozok and Salvendy (2000) adapted a framework from the area of software development (Adamson & Wallace, 1997) to study interface consistency of web page designs. They proposed a measuring system that adapted the three-dimensional model of interface consistency (developed by Adamson & Wallace, 1997) and proposed a list of elements in each dimension:

- 1) “Physical consistency” includes graphical appearance or the visual features of the webpage, such as font size, color, screen buttons, locations, labels, and so on.
- 2) “Communicational consistency” refers to how the user interacts with the website and the consistency of the input and the output of the interface, such as the consistent means of interaction for fulfilling the same or similar tasks (Rhee, Moon, & Choe, 2006). It includes the consistency for

moving between screens, menus, user conventions, hyperlinks, between task consistency and so on (Ozok & Salvendy, 2000).

- 3) “Conceptual consistency” refers to “the consistency of metaphor applied to an object or an action that is embodied within an object” (Ozok & Salvendy, 2000, p. 444). It focuses on the concept of how the system presents the concepts or delivers the messages exhibited in the interface (Mendel, 2010). For example, it is considered a conceptual inconsistency when using several terms to describe the same concepts, such as bloggers/ blogger users/ users (Rhee, Moon, & Choe, 2006). The elements in conceptual consistency include language, overall task concept, skill transfer, output-entry consistency, and so on (Ozok & Salvendy, 2000).

Several researchers have applied this model and examined the effects of web interface consistency (AlTaboli & Abou-Zeid, 2007; Mendel, 2010; Ozok & Salvendy, 2000; Rhee, Moon, & Choe, 2006) on user behavior. Rhee, Moon, and Choe (2006) found that a physically inconsistent e-learning system led to a higher error rate among skilled students, but it did not make a difference among the novices. Similar results showing that physically inconsistent web pages resulted in increased errors among the webpage users were also found by Ozok and Salvendy (2000) and AlTaboli and Abou-Zeid (2007). Mendel (2010) manipulated the website elements in the three dimensions of consistency to develop two conditions (consistent vs. inconsistent) of web pages to examine the interaction effect between “interface consistency” and “cognitive load” on “user performance” in an information search task. The findings showed interaction

effects, indicating that consistency was especially important when users were facing complex tasks (finance) with high cognitive load (more hyperlinks vs. no hyperlinks).

Based on the findings of previous researchers, in this present study the researcher proposed that the inconsistent product presentation format (hybrid) would escalate the negative responses (internal responses) resulting from the large choice set because it increases the task's cognitive load and complexity. Although Ozok and Salvendy (2000) did not include product images as an element in their three-dimensional model of consistency, based on the definitions of the dimensions, product images can be categorized as one of the elements in the physical consistency that represents the visual appearance of a website. Product images can also be categorized into the communicational consistency element because images deliver the product-related messages to consumers. As Ozok and Salvendy (2000) concluded in their study, physical and communicational consistencies interact with each other. To further examine the position of product images in the theory of interface consistency is beyond the scope of this study. However, according to the theory, product images represent one of the elements of web page consistency. Thus, the product presentation format is proposed to be influential on the too-much-choice effect. It is proposed to be a moderator in the model that would worsen consumers' online shopping experience. In order to examine all the combinations in the current market practices, the formats investigated in this study include one inconsistent condition, hybrid format (model and flat) and two consistent conditions, all models and all flats formats.

**Internal responses and attitude formation.** As indicated in the proposed model, one of the important factors in the too-much-choice effect is internal responses. As its definition provided, internal responses are the psychological responses resulting from the numbers of choices (stimuli). To further elaborate on this concept, internal responses can be deemed an evaluative response process that leads to the formation of consumers' attitudes toward a brand or a product. In line with this conceptual definition, the researcher used attitude theory as a basis to guide, understand, and explain the role of internal responses in the proposed model.

Eagly and Chaiken (1993, p. 1) defined attitude as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor.” Attitudes develop on the basis of evaluative responses to an “attitude object,” and the responses include three classes: affective, cognitive, or behavioral (Breckler, 1984; Eagly & Chaiken, 1993; Solomon, 2013). An attitude object can be anything that is concrete (e.g., an individual, a sport team, a product) or abstract (e.g., a behavior, an intention, an ideology) (Eagly & Chaiken, 1998). In other words, attitude objects are the entities that are evaluated. Among the evaluative responses, the affective responses refer to “an emotional response, a gut reaction, or sympathetic nervous activity”; the behavioral responses refer to “overt actions, behavioral intentions, and verbal statements regarding behavior;” the cognitive responses refer to “beliefs, knowledge structures, perceptual responses and thoughts constitute the cognitive component” (Breckler, 1984, p. 1191).

According to Eagly and Chaiken (1998, p. 16) “an attitude can be formed primarily or exclusively on the basis of any one of the three types of processes.” For example, an individual can form an attitude toward a product solely on the basis of

reading the product description online. In contrast, the internal responses can go through a hierarchical process. An attitude theory, the ABC model of attitudes, emphasized the interrelationships among feeling, learning, and doing (Solomon, 2013). This theory proposed that an attitude is an evaluative and learning process that exhibits three hierarchies of effects.

The first process is the standard learning hierarchy (Cognitive → Affective → Behavioral), sometimes referred to as the high involvement process. This process assumes that an individual forms attitudes starting with cognitive information processing. A consumer, for instance, learns about the product online and forms her/his knowledge and beliefs toward the product. Next, she may form a feeling about the product (affective) and, later, engage in a relevant behavior, such as making a purchase (Solomon, 2013).

The second process is the low-involvement hierarchy (Cognitive → Behavioral → Affective). The formation of attitudes is based on a behavioral learning process. A consumer may exhibit low attention to or knowledge of one brand (cognitive). After she has tried the product (behavioral), she has become familiar and attached with the product because of the good experience (affective). The behavior of trying the product reinforced her beliefs about the product and brand. An example of this process would be a consumer wanting to purchase a specific brand of yogurt in the supermarket, while this particular brand is out of stock. She then purchases a similar product but of a different brand. After trying, she forms a favorable feeling about the brand or the product that reinforces her choice (Solomon, 2013).

The third process is the experiential hierarchy (Affective → Behavioral → Cognitive), which emphasizes emotional reactions. This experiential perspective

highlights hedonic consumptions and “the idea that intangible product attributes, such as package design, advertising, brand names, and the nature of the setting in which the experience occurs, can help shape our attitudes toward a brand” (Solomon, 2013, p. 258). For apparel products, this probably is the most common process for attitude formation. The images of products provided by apparel brands not only present attributes about the products but also images of the lifestyle associated with the product. These images evoke the affective aspect of internal responses.

In this current study, the three components of attitude formation were applied to guide the development of measurement questions based on the finding of focus groups as well as used to explain the mechanism in the section of internal responses. The questions were developed to account for the three evaluative responses during the decision-making process. Although some researchers proposed that there is no hierarchical relationship among the three responses (Eagly & Chailen, 1993), taking the context (apparel online shopping) and the stimuli (the large choice set) into consideration, the researcher of the present study believes that there would be a hierarchical evaluative process within consumers’ internal responses. More specifically, the process that a consumer goes through in the context of apparel online shopping is likely to be the experiential hierarchy. When being exposed to a large number of choices, a consumer would feel overwhelmed first and probably generate some behavioral responses, such as an intention to give up on the search or a negative reaction towards the decision making activity. In turn, a consumer’s attitude towards the choice or decision-making process that is formed through the hierarchical process would further influence the consequential outcomes (Figure 5).

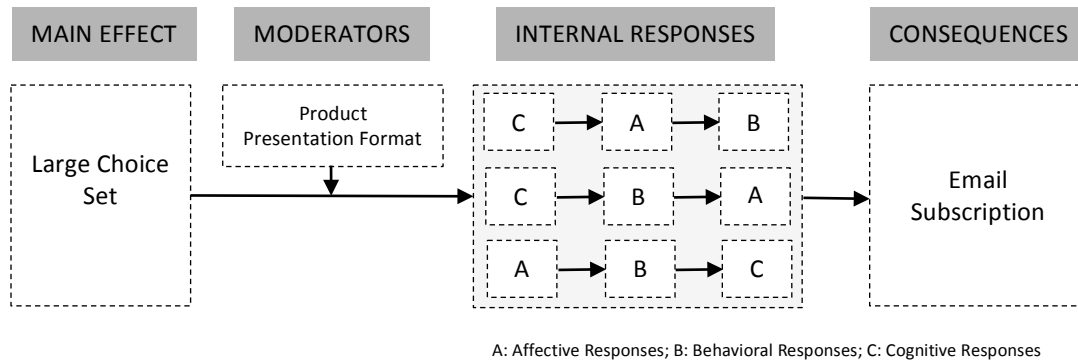


Figure 5 Proposed Model

### Behavioral Decision: Subscribing to a Mailing List

The researcher also aimed to further explore how the formed attitudes ultimately impact consumers' actual behaviors. As online marketers are reaching their potential customers through customized messages, targeted email advertising has become a popular form of advertising (Turban et al., 2012). Email marketing has several advantages to companies:

- 1) It is a relatively low-cost method, and the effectiveness is measurable.  
Companies can track how many consumers click on the links provided in the email.
- 2) It can reach a large number of consumers who have opted in to subscribe to the mailing list in a period of short time.
- 3) It is more likely to reach the target customer. Emails have been acknowledged by consumers as a legitimate and preferable way to be contacted by companies (Turban et al, 2012). Moreover, it is a more

personal communication channel that usually would not be shared to other people.

- 4) It is an interactive medium that can combine a couple of different functions by the companies, such as couponing, advertising, and conducting customer services.

Given the numerous listed advantages, the researcher of the present study was interested in how the effect of choice overload influenced the behavioral responses of subscribing to an email mailing list. Therefore, the last variable, which represents the *consequences* in the proposed model, is the behavioral response of subscribing to an email mailing list (Figure 5).

### **Control Variables**

The study was conducted to empirically examine the proposed model of the too-much-choice effect in the context of online apparel shopping. Because of the specific context, the researcher proposed to control four variables when analyzing the data. The four control variables are “perceived variety,” “online shopping frequency,” “fashion opinion leadership,” and “self-perception.” These four variables were proposed because they may have an influence on the dependent variables. If they do, the results may be biased without taking them into consideration in the data analysis. In this section, thus, the theoretical rationales for controlling for these variables were discussed with two subsections, one for perceived variety and the other for the remaining three variables.

**Perceived variety.** In this present study, the researcher identified an important variable that needs to be controlled in the data analysis, “perceived variety.” Although the negative impacts of choice overload were emphasized, consumers vary in their tendency to seek variety and enjoy having a large product assortment to choose from.

Levy and Weitz (2012, p. 32) defined “assortment” as “the number of products offered within a merchandise category.” With the emergence of specialty category stores, such as Best Buy, Office Depot, and Toys “R” Us, and the advent of Internet, the size of product assortment consumers face has exploded (Broniarczyk, 2006). Large product assortments (i.e., Best Buy offers 183 television models) bring a number of benefits to consumers and marketers. Broniarczyk, who calls this phenomenon as “the lure of assortment,” categorizes the benefits into two groups, process-related and choice-related benefits.

Process-related benefits are referred to as those that consumers obtain during engaging in the process of choosing. Large assortments provide benefits such as:

- 1) *Receiving stimulation that provides an individual the inherent satisfaction and pleasure utility.* Seeking stimulation seems to be a part of human nature. Researchers have indicated that the stimulation is inherently satisfying and more desirable for individuals with a higher optimal level of stimulation (Berlyne, 1960; van Trijp, Hoyer, & Inman, 1996). A consumer may derive the stimulation from seeking novelty among many options as well as pleasure from shopping experience (Babin, Darden, & Griffin, 1994).
- 2) *Perceiving freedom of choice.* Large assortments seem to be associated with perceived freedom (Reibstein, Youngblood, & Fromkin, 1975; Schwartz,

2004). Researchers have shown that having a choice is positively related to perceptions of control, and choice satisfaction (Botti & Iyengar, 2004; Langer & Rodin, 1976).

- 3) *Learning information about product attributes.* Large assortments provide consumers the opportunity to learn about the relevant attributes of a particular product category and make an informed evaluation. For example, a novice digital camera shopper can explore different models with various levels of attributes to help him/her make an assessment on the superiority of different models in the market.

Large assortments also provide choice-related benefits that are obtained at the purchase point:

- 1) *Maximizing the likelihood of finding desired product(s).* Broniarczyk (2006) further explained that large assortments increased the probability of a consumer finding a product matching their ideal point. This also explains the fact that a company tries to offer large assortments to consumers in that large assortments provide them the maximal opportunity to offer the desired attributes of the product to satisfy consumers' preferences.
- 2) *Providing flexibility for variety seeking and uncertain preferences.* Many factors could result in variety seeking behaviors. A classic review of variety seeking behavior by McAlister and Pessemier (1982) concludes that the variety seeking behavior may be derived from multiple needs (i.e. need different models for multiple users, situation, and uses) and a change in the

choice problem (i.e. a change in tastes). Therefore, large assortments meet the need of consumers in seeking various products. Moreover, when facing uncertain preferences, people have exhibited the tendency of variety seeking (Simonson, 1990). Thus, large assortments provide flexibility for consumers seeking diverse options.

As a result, when consumers perceived less variety in the selection they may feel less satisfied and happy with the product assortment and the brand. To ensure that perceived variety does not confound the results, the researcher proposed to control the variable in the data analysis. The researcher hypothesized that perceived variety would influence internal responses in the proposed model. More specifically, perceived variety may not have direct influence on affective responses (e.g., feeling overwhelmed) but would have a direct influence on behavioral responses (e.g., intentions to give up the search) and cognitive responses (e.g., positive beliefs towards the product and brand).

#### **Online shopping frequency, fashion opinion leadership, and self-perception.**

Rhee, Moon, and Choe (2006) found that skilled students made more errors in the e-learning system in which the website content was physically inconsistent, but the inconsistent website designs made no difference for the novices of the e-learning system. One of the explanations they provided was that the skilled students might exhibit expectations in how the interface should work due to their previous experiences. Thus, the way they performed the activity was driven by their previous experiences, and, in turn, overlooked some of the changes and consequentially made more errors. In this

present study, the researcher also proposed that a consumer with plenty of online apparel shopping experiences (online shopping frequency) or a stronger attitude towards fashion (fashion opinion leadership) may have developed preferred browsing mechanisms and had preferred presentation formats. As a result, these two variables may influence consumers' responses when facing choice overload. For example, the frequent online shoppers may feel upset when not being able to use filters on the website. The fashion opinion leaders may have strong views on how apparel products should be presented. Thus, these two variables may bias the internal responses or consequences examined in this study.

Furthermore, the concept of self-perception was designed to measure the value of clothes to a consumer. The researcher proposed that if the consumers did not value apparel products as entities that needed to be carefully selected, they might not browse all of the options in a large choice set and their internal responses would not be influenced by the number of choices. If this was the case, the too-much-choice effect might bias the results. Therefore, this concept also was measured and controlled.

## **Summary**

This chapter presents the theoretical rationales of the proposed model and the development of hypotheses. The theoretical model of the too-much-choice effect was developed by the researcher based on a review of literature. The model consists of four elements: main effect, internal responses, consequences, and moderators. The main effect is the large choice set that intends to introduce choice overload. The internal responses are the attitudinal responses (affective, behavioral, and cognitive responses) that result

from the main effect. The consequences are the outcomes that result from the main effect through the internal responses. The moderators are the factors that mitigate or aggravate the too-much-choice effect (the effect between the main effect and internal responses).

To empirically test the model, the researcher proposed to apply the model in the context of apparel e-commerce. According to the research studies in choice overload, the large number of products (thumbnail images) presented on a web page should easily lead to the too-much-choice effect. As the proposed model illustrated, the large number of presented products would result in the negative consequence (in this context, it is “not subscribing to a mailing list”) through a series of linked mediators (attitudinal responses). The effects of hierarchy in the ABC model of attitudes provided logistical suggestion in the explanation of the mechanism of the linked mediators. In addition, product presentation formats were proposed as a moderator that influences the relationship between the number of products and the internal responses based on the interface consistency theories.

The marketing medium of emails has become an important tool for brands to reach their consumers in a cheaper, faster, and more direct way. Obtaining consumers’ email addresses has been important for brands to enhance their marketing communication with their consumers. Whereas it is the goal to encourage their consumers to leave their email addresses by signing up for the mailing list, the present researcher proposed that the number of choices might indirectly influence their behavioral decision in the email mailing list subscription. Furthermore, four control variables were proposed in data analysis in the specific context: perceived variety, online shopping frequency, fashion opinion leadership, and self-perception.

## CHAPTER 3

### METHODS

The present research study incorporated a three-stage data collection protocol. The first stage explored choice overload in the specific context of apparel online shopping through two focus groups of female college students. The second stage was a pretest for the main experiment and served the purpose of developing the experimental stimuli. Female students' preferences towards a variety of top/t-shirt styles (gathered by the researcher in advance) were collected. The third stage was the main experiment using a survey method. A summary of the objectives of the three stages is presented in Table 1.

Table 1 Summary of Objectives of Three Data Collection Methods

Stage	Data Collection Method	Objectives
1	Focus Group	<ol style="list-style-type: none"> <li>1) To better understand consumers' decision-making process during apparel online shopping.</li> <li>2) To identify appropriate number of choices and moderating variables for experiment stimuli development.</li> <li>3) To identify specific favorable and unfavorable experiences towards the shopping decision-making process.</li> <li>4) To develop questionnaire questions for Stage 3.</li> </ol>
2	Pretest	<ol style="list-style-type: none"> <li>1) To identify the appropriate top/t-shirt styles for experiment stimuli (mock websites).</li> <li>2) To eliminate the most popular and the least popular styles.</li> </ol>
3	Main Experiment	<ol style="list-style-type: none"> <li>1) To test the proposed hypotheses.</li> </ol>

In the following sections, information regarding the procedures of each stage, descriptive statistics of each sample, experimental stimuli, and measurement instruments are presented. All procedures were approved by the Institutional Review Board (IRB) at Oregon State University (OSU) prior to data collection. The IRB approvals are included in Appendix A.

### **Stage 1 – Focus Group**

**Procedures.** One of the objectives of this study was to better understand college students' apparel online shopping behavior. The researcher sent out a recruitment email invitation (Appendix B) through class instructors in the School of Design and Human Environment and through the social mailing list of the Coalition of Graduate Employees. In the invitation, students were provided a website link where they could sign up for the focus group sessions. Next, the researcher sent out an email to those students who had signed up to confirm their assigned session. A reminder email was sent to the participants the day before their assigned session as well. Students who participated in the focus groups had an opportunity to enter a \$100 cash raffle. One winner was drawn within two weeks after the sessions ended. The flowchart in Figure 6 shows the recruitment process. Four sessions of focus groups were arranged from the 13<sup>th</sup> to the 16<sup>th</sup> April 2015. Each session was designed for 90 minutes (7:00 – 8:30 p.m.). The discussions were video taped and transcribed for further data analyses.

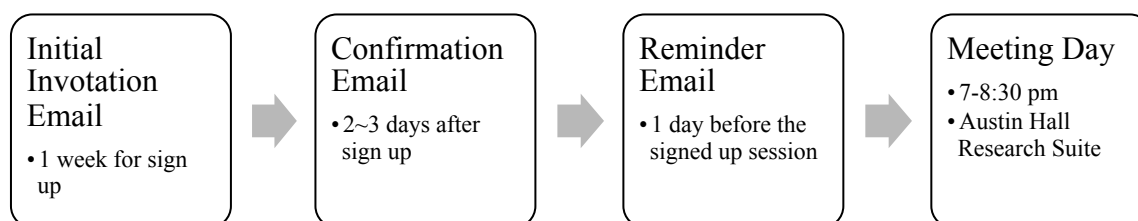


Figure 6 Recruitment Process of Focus Groups

**Sample.** The primary objective of the focus groups was to explore shoppers' favorable and unfavorable attitudes towards their apparel online shopping decision making process. Attitudes may have been related to website designs, website navigations, and purchase and return policies. Thus, recruiting individuals who had apparel online shopping experiences was important. Therefore, two criteria were developed to recruit the focus group participants: a) at least 18 years old, and b) had made at least one apparel product purchase online in the past six months.

A total of 17 female students at OSU participated in the two focus groups (eight in the first session and nine in the second session). Ten male participants took part in another focus group session. Although male participants' responses were collected, gender comparisons were difficult due to participants' unequal levels of satisfaction of survey qualification constraints. Thus, in this dissertation the male participants' responses were collected but excluded from the subsequent studies and data analyses.

Among the 17 female participants, class standings ranged from sophomore to graduate students. There were no first year students in the groups (Table 2); 47.1 % of participants were seniors. The purposive convenience non-probability sample was used,

and most of the participants were from the College of Business. Over 60 % of them were white, and 23.5 % of them were Asian/Pacific Islander. The average age was 24.9 years old with a median of 22 years.

**Instruments.** A semi-structured topic guide was developed for the focus group discussions (see the detailed topic guide in Appendix C). The topic guide consisted of five sections. The first section included an Introduction (2 minutes) and Icebreaker (10 minutes). Participants were asked to write down their answers for questions such as the retailer websites they usually visit and products they will definitely not buy online and, then, to share their answers with the other participant. The second section was where participants were encouraged to share their General Apparel Online Shopping Experiences (10 minutes). Questions related to their preferred website features and enjoyable shopping experiences were asked. The third section was the Projective Activity I (25 minutes). Two cartoons that were developed specifically for this study were shown to the participants. The moderator showed the first cartoon (Figure 7) to participants and asked them the question, “If she is shopping for clothes online, what is she thinking?” Participants were asked to write down a story for the comic. Next, they were shown a second cartoon (Figure 8) in which they could see the facial expression of the character in the cartoon. Participants were asked to answer the same question based on the second cartoon they saw. The fourth section was Projective Activity II (25 minutes). In this section, the moderator showed participants the web page of tops (apparel product category) on a retailer’s website (Kohl’s ) and asked them questions related to their preferences on the website design, navigation, the preferred number of products

displayed on one web page, and so on. The researcher selected Kohl's website because of its large number of products and busy website design such as banner ads for special offers and sub-tabs under each product category. The participants also suggested some other websites they like or dislike to facilitate the discussion. The last section was the Ideal Online Clothes Shopping Experience (15 minutes) and Wrap-Up (2 minutes). In this section, participants were asked to describe their enjoyable shopping experiences or their expectations of a satisfactory shopping experience. Each focus group lasted approximately 90 minutes.

**Table 2 Characteristics of Participants in the Focus Groups**

Characteristics		Sample (Freq.)	Sample (%)
Class Standing	Sophomore	1	5.9
	Junior	5	29.4
	Senior	8	47.1
	Grad Student	3	17.6
Majors	Business	15	88.2
	Engineering	1	5.9
	Science	1	5.9
Ethnicity/ Race	Asian/ Pacific Islander	4	23.5
	Caucasian (White)	11	64.7
	Hispanic/Latino	1	5.9
	Arabic	1	5.9

Note: N = 17. Average age: 24.9. Median age: 22. Age range: 19-44.

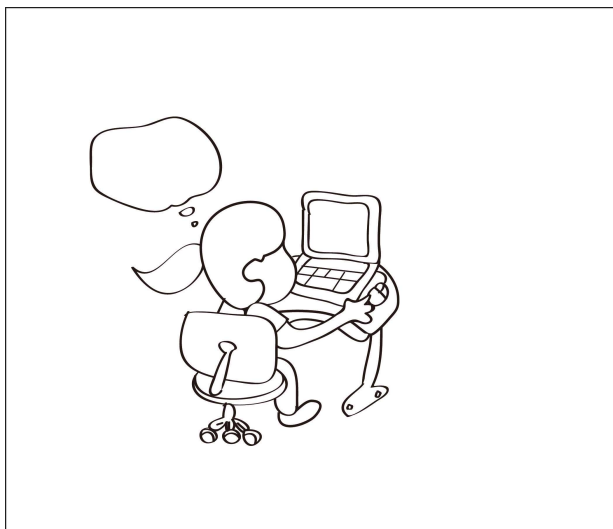


Figure 7 Comic 1 for Projective Activity I in Focus Groups



Figure 8 Comic 2 for Projective Activity I in Focus Groups

## **Stage 2 – Pretest**

**Procedures.** The primary objective of the pretest was to eliminate the most popular and the least favorable styles of tops to mitigate the choice bias during the task that would be given in the main experiment. The researcher first identified several women's wear retailers who provided both of the following two types of images for each style on their websites, one that displayed the women's top on a human model and one that displayed the product by itself on a hanger or flat (Figure 4). Because product display type was one of the variables that would be examined in the experiment, collecting both types of images from the same style would help the researcher ensure the internal validity of the study. The researcher collected a total of 264 images from 132 styles of women's tops as possible stimuli for the main experiment. Next, the researcher invited female college students at OSU majoring in Apparel Design and/or Merchandising Management to rate the styles. Each of the students rated 24 styles so that each style would receive at least 10 ratings.

**Sample.** Ninety-seven female college students from one of the advanced-level courses in the Apparel Design and/or Merchandising Management majors were recruited to participate in the pretest. Most of the students were seniors; 16.5 percent of them were juniors. The average age was 22.9 with a median of 22 years. Over 70 percent of them were white, and 13.4 percent of them were Asian/ Pacific Islander. Table 3 shows the characteristics of the respondents in the pretest.

Table 3 Characteristics of Respondents in the Pretest

Characteristics		Sample (Freq.)	Sample (%)
Class Standing	Junior	16	16.5
	Senior	80	82.5
	Grad Student	1	1
Ethnicity/ Race	Asian/ Pacific Islander	13	13.4
	Black/ African American	4	4.1
	Caucasian (White)	71	73.2
	Hispanic/Latino	6	6.2
	Two or More Races	2	2.1
	Arabic	1	1.0

Note: N = 97. Average age: 22.9 years. Median age: 22 years. Age range: 20-44 years. All the respondents are from College of Business with either a major or minor in Apparel Design and Merchandising Management.

**Instruments.** An online questionnaire was developed (see the full pretest questionnaire in Appendix D). Each participant rated 24 styles that were randomly assigned to her from the 132 styles. To avoid judgment bias that might result from additional information presented in the image, such as model poses and garment coordination, only the “object” images were used in the pretest. For each style, the image was followed by the question, “I can see myself wearing this style.” Participants were asked to give a score to show their agreement with the statement, from 1 “Strongly Disagree” to 100 “Strongly Agree.” After the image-rating activity, some basic demographic questions followed, such as age, class standing, and ethnicity/race.

Each style received at least 10 ratings. Some of them received as many as 27 ratings. The six styles that received the highest mean scores and the six styles that received the lowest mean scores were excluded from the development of the experiment stimuli. The average mean score of each style ranged from 3.33 to 78.40. The mean

scores of the lowest six styles were 3.33, 3.88, 6.25, 8.00, 8.26, and 8.44, respectively, and those of the highest six styles were 78.40, 78.12, 77.28, 74.83, 73.75, and 73.33. These 12 styles were excluded in the stimuli development, resulting in a total of 120 styles.

### **Stage 3 – Main Experiment**

**Procedures.** The main experiment was designed to collect data needed to test the proposed hypotheses. First, the researcher aimed to empirically examine the moderating effect of product presentation consistency on the relationship between the number of choices and internal responses/attitude formation. Second, the researcher aimed to test the proposed model that illustrated the process of how the number of choices affected behavioral responses through mediators (internal responses/attitude formation).

A 3 (number of choices: 24 vs. 60 vs. 120) by 3 (presentation consistency: human model vs. flat vs. hybrid) factorial design was employed. Table 4 shows a summary of each condition. The three numbers of choices (24, 60, and 120) were identified based on the result of the focus groups. Participants in the focus groups indicated that fewer than 25 displayed products constituted too few choices, and those above 96 were too many. In addition, product presentation consistency was continuously mentioned in the discussions. Thus, based on the literature review and the focus group discussions, the levels of the number of choices and the moderating variable were identified.










Nine mock web pages were developed representing each of the nine conditions. Participants were randomly assigned to one of the nine conditions. In the survey they were asked to select one top from the choices given on the web page and to answer

questions about their experiences during the decision-making process. For instance, the web page might show them 24 top styles, and they were asked how they felt about the website and the choice they selected. A scenario (Appendix E) was given in order to engage participants in the selection process.

**Stimuli.** An online survey was developed for the experiment that consisted of the nine mock web pages. Participants were randomly assigned to one of the conditions. A women's wear retailer's (Boden.com) web page was used as a reference to develop the stimuli. The web page of Condition 3 was developed first. The researcher used Microsoft Office Excel to create a random order of the styles and arranged the images based on the order. Next, Condition 1 and Condition 2 were developed based on the same order. Web pages for Condition 4 to 6 were created using the same arrangement order. The only difference was that all the images were replaced by the "flat" ones.

Web pages of Conditions 7 through 9 included the hybrid presentations combining half of the styles using model images and the other half using images of flats. Condition 1 was used as the template for developing the web page of Condition 7. The researcher used Microsoft Office Excel to create a random list again to determine which styles should be replaced by images of flats to create a hybrid (inconsistent) presentation. For Condition 8, Condition 2 was used as a template. Because the arrangement of the first 24 styles had been determined in Condition 7, another random list was created for the rest of the 36 styles to determine which styles would be replaced by images of flats. Condition 9 used Condition 3 as a template and followed the same steps as those in creating Condition 8. See Figure 9 for examples of the experiment stimuli.

Table 4 Nine Conditions of the Factorial Design

		Number of Choice		
		24	60	120
Product Presentation Consistency	Consistency – All Models	 Condition 1	 Condition 2	 Condition 3
	Consistency – All Flats	 Condition 4	 Condition 5	 Condition 6
	Inconsistency – Hybrids	 Condition 7	 Condition 8	 Condition 9

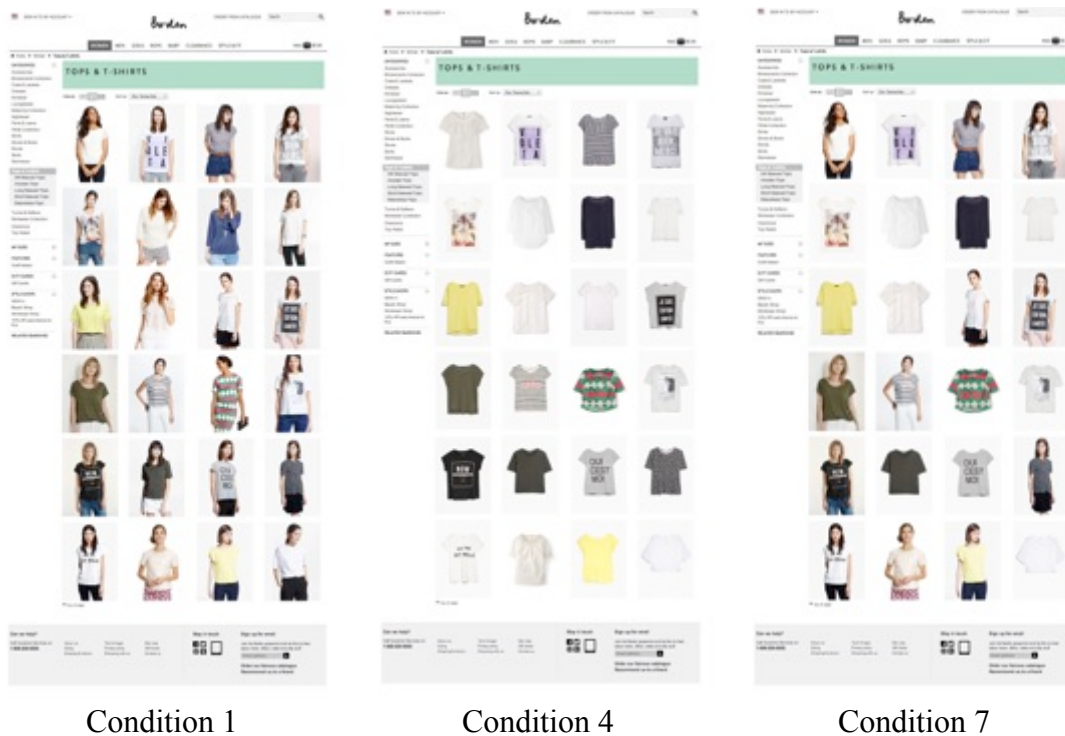


Figure 9 Examples of the Experiment Stimuli

**Sample.** Female college students at Oregon State University (OSU) were recruited for the main experiment. Some were recruited through class instructors who sent out the email invitation to their students, while others were recruited through flyers distributed on campus by the researcher. Respondents who participated in the main experiment had an opportunity to enter a \$150 cash raffle. One winner was drawn and announced within two weeks of the end of the experiment.

A total of 382 useable responses were collected. Eight hundred and ninety four respondents started the survey for the main experiment. However, the number of usable responses decreased to 382 after excluding ineligible responses such as incomplete surveys (291), male students (50), missing data (9), non-undergraduate students (29), those who had shopped on “Boden” website (15), those who used mobile devices to take

the survey (116), and, lastly, those who showed a straight line pattern in answering the questions (2). Because the researcher used a real brand name and brand website as the template for the stimuli (mock website), to control for brand familiarity, responses from those who had previous shopping experiences with the retailer were eliminated. In addition, the web pages were designed based on the dimensions and resolutions for laptops or desktops. Therefore, responses of those who used mobile devices, such as smart phones and tablets, to take the survey were excluded. The rate of obtaining usable responses with the recruiting methods applied in this study was 42.73 percent.

Among the 382 respondents, about 34 percent were junior class standing, followed by 25.1 percent seniors, 21.7 percent freshmen, and 19.1 percent sophomores. The female students represented eight college majors at OSU with a majority of Business majors (almost 53 percent), most likely an artifact of the recruiting methods. All the instructors who disseminated the survey link were conducting courses in the College of Business. Over 68 percent of the sample was white, and 16 percent were Asian and/or Pacific Islander. The multiracial group constituted 9.7 percent of the sample. Compared to the OSU Undergraduate Enrollment Statistics in Fall 2015, the sample of this study included more juniors. The majors from “Agricultural Sciences,” “Earth, Ocean, and Atmospheric Sciences,” “Engineering,” “Forestry,” and “Liberal Arts” were underrepresented in this study. Table 5 shows a summary of the characteristics of the respondents and the comparison.

Over half of the participants made a purchase online at least once every two to three months. The cumulative percentage for the following three categories, “More than once a month,” “Once a month,” and “Once every 2-3 months,” was about 64 percent. In

this sample, one out of 10 indicated that they purchased apparel products online more than once a month.

However, seven participants indicated that they had never purchased any apparel products online (Table 6). Among a variety of apparel product categories, tops/ t-shirts/ blouses were the most purchased products within the past 12 months with the total quantity of 1521 based on the responses. The second frequently purchased product category was “Intimate Apparel,” followed by “Dresses,” “Sweaters,” “Jackets/ blazers/ coats,” “Jeans,” “Other pants,” and “Skirts” (Table 7).

**Instruments. *Scenario.*** To engage participants in the choice decision-making activity, a scenario was given before they saw the mock web page. They were told that this survey was for a new apparel retailer who was interested in learning about which of the products participants would purchase in order to develop its future product assortment. Participants would be asked to browse the retailer’s website and choose one top for themselves as well as answering some questions regarding their online shopping experience.

Table 5 Characteristics of Respondents in the Experiment

Characteristics		Sample (Freq.)	Sample (%)	OSU Undergraduate Enrollment* (%)
Class Standing	Freshman	83	21.7	18.2
	Sophomore	73	19.1	19.8
	Junior	130	34.0	22.4
	Senior	96	25.1	28.9 <sup>a</sup>
Majors	Agricultural Sciences	17	4.5	7.5
	Business	202	52.9	10.8
	Earth, Ocean, & Atmospheric Sciences	1	0.3	1.8
	Engineering	28	7.3	23.6
	Forestry	3	0.8	2.8
	Liberal Arts	29	7.6	12.4
	Public Health & Human Science	43	11.3	10
	Science	42	11.0	10.6
	Other	17	3.4	3.7
Ethnicity/ Race	Asian/ Pacific Islander	61	16.0	7.3
	Black/ African American	4	1.0	1.3
	Caucasian (White)	263	68.8	65.2
	Hispanic/ Latino	11	2.9	8.5
	Native Indian/ Alaskan American	1	0.3	0.0
	Two or More Races	37	9.7	6.6
	Other	5	1.3	— <sup>b</sup>

Note: N = 382. Oregon State University undergraduate enrollment in Fall term 2015 total N = 24,612.

a. The remaining of 10.7 % are Post Baccalaureate and Non-Degree Undergrad.

b. The percentages provided by OSU Enrollment Summary (Fall 2015) do not include International Students and Declined/Missing data.

\*OSU Source: Oregon State University Office of Institutional Research:

<http://oregonstate.edu/admin/aa/ir/enrollmentdemographic-reports>

Table 6 Apparel Product Online Shopping Frequency

	Sample (Freq.)	Sample (%)	Cumulative Percentage (%)
More than once a month	39	10.2	10.2
Once a month	73	19.1	29.3
Once every 2-3 months	132	34.6	63.9
Once every 4-6 months	59	15.4	79.3
Once every 7-12 months	41	10.7	90.0
I have purchased, but not within last year	31	8.1	98.1
I have never purchased apparel products online	7	1.8	100.0

Note: N = 382.

Table 7 Within the past 12 months, how many the following items have participants purchased online?

Product Category	Min.	Max.	Mean	Std. Deviation	Median	Sum
Tops/ t-shirts/ blouses	0	30	3.98	5.08	2	1521
Intimate apparel	0	40	2.11	4.47	0	805
Dresses	0	20	1.88	2.94	1	720
Sweaters	0	20	1.31	2.46	0	499
Jackets/ blazers/ coats	0	30	0.84	2.15	0	319
Jeans	0	15	0.75	1.55	0	286
Other pants	0	20	0.61	1.75	0	232
Skirts	0	15	0.50	1.49	0	192

Note: N = 382.

***Questionnaire.*** An online questionnaire consisting of four sections was developed. The full questionnaire can be found in Appendix E. The first section was comprised of questions related to fashion leadership and apparel product presentation preferences. In the second section, participants were given the scenario and asked to select one choice among the styles on the web page they saw. Next, they were asked questions regarding their decision-making process. The third section was designed to observe respondents' actual behavior. Participants were given the opportunity to change their choice and subscribe to an email mailing list from the retailer. The last section consisted of basic demographic questions and questions about their online shopping frequency. It also included the debriefing information.

***Fashion Opinion Leadership.*** Six items of fashion opinion leadership were adopted from Goldsmith, Freiden, and Kilsheimer (1993). A seven-point Likert scale was applied with "1" as "Strongly Disagree" to "7" as "Strongly Agree." Questions such as "I am aware of fashion trend and want to be one of the first to try them" and "I am confident in my ability to recognize fashion trends" were asked. Table 8 provides a complete list of the questions.

***Apparel Product Presentation Preference.*** Eleven questions related to consumers' preferences towards "apparel product presentation" were included in the questionnaire. These questions were developed based on the findings of focus groups in this study and were developed to better understand respondents' product presentation and shopping preferences. Questions included "I prefer to see all products displayed on human models," "It is easier for me to predict how a product will look on me when I see it on a human model than other types of displays," and "I do not have a preference as to whether

apparel products are displayed on human models, mannequins, or by themselves on a website” (Table 8). Participants answered these questions on a seven-point Likert scale (1 – Strongly Disagree to 7 – Strongly Agree). Because the items were developed based on the findings of the focus groups in this study, the researcher conducted a factor analysis to identify the dimensions of the items followed with internal reliability tests. The reliability of the factors was also examined. The results of the factor analysis are discussed in the next chapter.

***Priming Question.*** The second section of the questionnaire was comprised of one priming question, the scenario, choice-selection activity, manipulation check questions, and questions related to the activity. Before the participants were given the scenario, to engage them with the context of the activity, they were asked to read the following statement and rate their level of agreement on a seven point Likert scale (1 – Strongly Disagree to 7 – Strongly Agree).

“Researchers have asserted that an individual would enhance her self-concept through products consumed. Clothes are a good example, because clothing has been recognized as a product with strong symbolic meaning in expressing an individual’s identity.

How much do you agree with this statement?”

The purpose of having this question was to prime participants to pay attention to the given choices by evoking their perception of associating self-identity and clothes as well as making this decision-making process closer to their real-life online shopping

experience. This question was included in further data analyses as an important control variable.

***Manipulation Check Questions.*** Three questions were included in the questionnaire to check the effectiveness of the stimuli. The first question was related to the authenticity of the web page, “The website was realistic compared to other shopping websites I usually visit.” A seven-point Likert scale was applied (1 – Strongly Disagree to 7 – Strongly Agree). The researcher wanted to ensure that the interaction that participants had with the stimuli was close to their real-life online shopping experience to retain the external validity. The other two questions were designed to confirm the internal validity of the experiment. The second question related to the perception of image sizes. Because this was a self-administered online survey, the devices that participants used to conduct the activity were not controlled. Therefore the question “The images were big enough for me to examine the website,” was asked with a seven-point Likert scale (1 – Strongly Disagree to 7 – Strongly Agree). The last question was related to the number of choices manipulated in this study, “The number of potential products is ... .” Participants were asked to rate on a 1 to 7 scale in which 1 represented “Too few,” 4 represented “About right,” and 7 represented “Too many.” Participants who were assigned to the large number of choice conditions should feel that there were too many choices, whereas those who were in the small number of choice conditions should feel that they are getting insufficient options to choose from.

***Perceived Variety.*** As discussed in Chapter Two Literature Review, consumers possess a number of needs that result in variety seeking behavior, such as acquisition of information and acquisition of new products (McAlister & Pessemier, 1982). Consumers

consider having variety in the product assortment generally as positive (Ratner & Kahn, 2002) and brings positive affect (Kahn & Wansink, 2004). Therefore, one question adapted from Kahn and Wansink (2004) was included in the questionnaire to measure consumers' perceived variety as a control variable in the data analysis. The question, "This assortment of tops offers a lot of variety," was measured on a 1 – Strongly Disagree to 7 – Strongly Agree Likert scale.

***Internal Responses.*** Twenty-one items were used to investigate a respondent's internal responses during the choice-making process. These questions were developed based on the discussions of the focus groups and were intended to measure the participants' feelings, behavioral intentions, and cognitive thoughts when facing too much choice. Example questions in this section included "I felt overwhelmed with the number of products on the website," "If I were actually shopping for a top, I would not purchase a top from this site," and "This top is the item that if I did not buy it now, I would keep thinking about it." All the questions were measured by the seven-point Likert scale (1 – Strongly Disagree to 7 – Strongly Agree). See Table 8 for the complete list of all the questions.

The order of these questions was randomly arranged in the questionnaire. When analyzing the data, factor analysis was applied first to determine the number of underlying dimensions in the set of 21 items. The extracted factors identified served as the outcome variables and mediators in subsequent data analyses based on the proposed hypotheses. The result of the factor analysis is presented in the next chapter. Furthermore, additional data analyses on the relationships among the identified factors were conducted according to the attitude theory (ABC Model).

***Behavioral Decision.*** To measure respondents' actual behavior, the researcher designed a question in the questionnaire that required participants to make a further decision. As previously noted, the scenario was provided in the questionnaire to persuade participants that this was actual marketing research about online shopping. In the question, participants were asked if they would like to receive emails from the retailer regarding their products in the future. The binary scale included "Yes, I would like to receive emails from the retailer regarding their products in the future;" and "No, I do not want to receive emails from the retailer regarding their products in the future."

***Demographics and Online Shopping Experience.*** In the last section of the questionnaire, questions about participants' demographic characteristics and online shopping experience were asked. The demographic characteristics included age, class standing, major, and ethnicity/race. In addition, to better understand participants' online shopping experience, they were asked about their online shopping frequency and apparel products they had purchased within the past 12 months.

## **Summary**

This chapter provided the detailed information of data collection methods used for the study including procedures, instruments, and samples. The data collection process consisted of three stages. First, because the limited literature on choice overload in apparel e-commerce, focus groups were conducted to explore consumers' general attitude towards their online shopping experiences. In addition, results of the focus groups provided the researcher with information on how many products presented on the web

page were considered too many and too few. Based on the findings of the focus groups, 21 questions were developed to measure a respondent's internal responses.

The second stage was the pretest stage. The objectives of the pretest were to identify appropriate top styles for the mock websites and eliminate the most and least popular styles. The researcher collected 132 top styles, with 12 styles (6 most popular and 6 least popular) eliminated. Ninety-seven female students rated the styles. Each style received at least 10 ratings. The results of this stage were used to design the experiment in stage 3.

In the third stage – main experiment, a 3 (number of choices: 24 vs. 60 vs. 120) by 3 (presentation consistency: human model vs. flat vs. hybrid) factorial design was employed. Respondents were randomly assigned to one of the nine conditions and asked to conduct a selection activity. A total of 382 usable responses were collected. Two-way ANCOVA and SEM analysis were applied to analyze the data. As the proposed model illustrated, the independent variable was the number of choices; the mediators were the variables in the internal responses; the consequence examined in this study was subscribing to an email mailing list; the moderator was the product presentation formats.

Table 8 Items and Measurement Scales in the Questionnaire

Variable	Item	Measurement Scale
Fashion Opinion Leadership  (Adopted from Goldsmith, Freiden, and Kilsheimer, 1993)	<ol style="list-style-type: none"> <li>1. I am aware of fashion trends and want to be one of the first to try them.</li> <li>2. I am the first to try new fashions; therefore, many people regard me as being a fashion leader.</li> <li>3. It is important for me to be a fashion leader.</li> <li>4. I am confident in my ability to recognize fashion trends.</li> <li>5. Clothes are one of the most important ways I have of expressing my individuality.</li> <li>6. I spend a lot of time on fashion-related activities.</li> </ol>	1 (Strongly Disagree) to 7 (Strongly Agree)
Apparel Product Presentation Preference  (Developed in this study)	<ol style="list-style-type: none"> <li>1. I do not need to see the products on human models to make a purchase decision.</li> <li>2. I prefer to see all products displayed on human models.</li> <li>3. I prefer to see all products displayed by themselves (not on human models or mannequins).</li> <li>4. I like that I could view all products on one page.</li> <li>5. I do not have a preference as to whether apparel products are displayed on human models, mannequins, or by themselves on a website.</li> <li>6. Typically, products look best when they are on human models.</li> <li>7. Typically, human models on apparel websites are attractive.</li> <li>8. It is easier for me to predict how a product will look on me when I see it on a human model than other types of displays.</li> <li>9. Just because a product looks good on the model does not mean that it will look good on me.</li> <li>10. Presenting a product on a human model helps me make my purchase decision.</li> <li>11. I feel more confident selecting a product to purchase when the product is displayed on a human model.</li> </ol>	1 (Strongly Disagree) to 7 (Strongly Agree)
Priming  (Developed in this study)	“Researchers have asserted that an individual would enhance her self-concept through products consumed. Clothes are a good example, because clothing has been recognized	1 (Strongly Disagree) to 7 (Strongly Agree)

Variable	Item	Measurement Scale
	as a product with strong symbolic meaning in expressing an individual's identity.	
	1. How much do you agree with this statement?"	
Manipulation Check	1. The website was realistic compared to other shopping websites I usually visit.	1 (Strongly Disagree) to 7 (Strongly Agree)
(Developed in this study)	2. The images were big enough for me to examine the tops.	1 (Strongly Disagree) to 7 (Strongly Agree)
	3. The number of potential products is ...	1 to 7 scale: 1 (Too few); 4 (About right); 7 (Too many)
Perceived Variety	1. This assortment of tops offers a lot of variety.	1 (Strongly Disagree) to 7 (Strongly Agree)
(Adapted from Kahn & Wansink, 2004)		
Internal Responses	1. I felt overwhelmed because many of the products seem very similar to one another.	1 (Strongly Disagree) to 7 (Strongly Agree)
(Developed in this study)	2. I wish I could have seen customer reviews for each top.	
	3. I felt bored going through the products on the website.	
	4. I wish there was a quick view window.	
	5. If I were to actually purchase the top I selected, it is likely that I would regret my decision.	
	6. I wish I could have used filters to find the style I like.	
	7. I felt lost because there are too many options on the website.	
	8. I have difficulty remembering the different options that were available on the webpage I viewed.	
	9. If this top was actually available for purchase, I would buy it for myself.	
	10. I was frustrated because the assortment of products did not provide a good selection.	
	11. I thought it was fun to browse through the tops on the website.	

Variable	Item	Measurement Scale
	12. I liked the website design. 13. It was difficult to evaluate the tops when I was trying to make a decision. 14. I felt overwhelmed with the number of products on the website. 15. I would be willing to register with this retailer in order to proceed to check out and purchase a top from this site. 16. It was difficult to make my decision because I found more than one top I like. 17. I needed to make some trade-offs in deciding which top I should select. 18. This top is the item that if I did not buy it now, I would keep thinking about it. 19. If I were actually shopping for a top, I would not purchase a top from this site. 20. During this process, I wanted to give up on searching for a top to select. 21. I wish there were more views of each garment when trying make a decision.	
Consequences (Developed in this study)	1. Would you like to receive emails from the retailer regarding their products in the future?	1 (Yes, I would like to receive emails from the retailer regarding their products in the future.) and 2 (No, I do not want to receive emails from the retailer regarding their products in the future.)
Online Shopping Experience (Developed in this study)	1. How often do you purchase "apparel" products online?  2. Within the past 12 months, how many the following items have you purchased online?	1 to 7 scale: 1 (More than once a month); 2 (Once a month); 3 (Once every 2~3 months); 4 (Once every 4~6 months); 5 (Once every 7~12 months); 6 (I have purchased, but not within last year); 7 (I have never purchased apparel products online)  Actual number

Variable	Item	Measurement Scale
	<ul style="list-style-type: none"><li>• Tops/ t-shirts/ blouses</li><li>• Sweaters</li><li>• Dresses</li><li>• Jackets/ blazers/ coats</li><li>• Jeans</li><li>• Other pants</li><li>• Skirts</li><li>• Intimate apparel</li></ul>	

## **CHAPTER 4**

### **RESULTS**

To test the hypotheses that were designed to answer the research questions, a number of data analysis procedures were conducted. In this chapter, the results of data analyses are presented in the following order: manipulation checks, factor analyses, scale reliability, two-way analysis of covariance (ANCOVA) analyses, and model analyses. The software programs used to conduct the data analyses were the IBM SPSS Statistics 22 and Mplus version 7.11

#### **Manipulation Checks**

The manipulation checks were conducted for the “Stage 3 – Main Experiment.” The purpose of the manipulation checks was to ensure the external and internal validity of the experiment. Three questions were developed: a) “The website was realistic compared to other shopping websites I usually visit;” b) “The images were big enough for me to examine the tops;” c) “The number of potential products is... (1) too few...(4) about right...(7) too many.”

The first and second questions were developed to confirm the external validity of the experiment stimuli (mock websites). The examinations of the descriptive statistics of both questions, perceived website authenticity and image size, were analyzed with the IBM SPSS Statistics 22. The results showed that participants in the nine conditions perceived a high level of website authenticity of the mock websites. The range of the

averages is from 5.00 to 5.67 with the range of standard deviations (SD) from 1.08 to 1.56 (Table 9). Furthermore, the results showed that participants in all the groups felt the images were big enough on the websites for them to examine the tops. The range of the average ratings is from 4.67 to 5.67 with the range of SDs from 1.08 to 1.56 (Table 10).

Table 9 Mean and Standard Deviation on the Measure of Perceived Website Authenticity as a Function of Groups.

Condition	n	Website Authenticity		Minimum	Maximum
		Mean	Std. Deviation		
1	45	5.67	1.24	3	7
2	37	5.22	1.36	2	7
3	46	5.54	1.35	1	7
4	45	5.31	1.46	2	7
5	35	5.14	1.38	1	7
6	41	5.12	1.21	3	7
7	44	5.05	1.26	2	7
8	47	5.47	1.08	3	7
9	42	5.00	1.56	1	7
Total	382	5.29	1.33	1	7

Note: 1 (Strongly Disagree) to 7 (Strongly Agree).

Table 10 Mean and Standard Deviation on the Measure of Perceived Image Size as a Function of Groups.

Condition	n	Image Size		Minimum	Maximum
		Mean	Std. Deviation		
1	45	4.89	1.82	1	7
2	37	5.24	1.30	2	7
3	46	4.52	1.64	1	7
4	45	4.67	1.99	1	7
5	35	4.71	1.56	2	7
6	41	4.76	1.74	1	7
7	44	5.05	1.46	2	7
8	47	4.89	1.58	2	7
9	42	5.24	1.38	1	7
Total	382	4.88	1.63	1	7

Note: 1 (Strongly Disagree) to 7 (Strongly Agree).

The third question was developed to examine the internal validity of the experiment stimuli (the number of choices). The question was intended to ascertain that the participants in the small choice groups perceived the selection options as being too few, whereas those in the large choice groups perceived having too much choice. One-way analysis of variance was conducted with the statistical package, IBM SPSS Statistics 22. The descriptive statistics were presented in Table 11. The mean comparison among the three choice sets (24 vs. 60 vs. 120) showed that the amount of the provided tops was perceived statistically differently,  $F(2, 379) = 12.30, p < .001$  (Table 12).

*Post Hoc* tests were conducted to determine which of the two groups showed statistical mean differences. Fisher's Least Significant Difference (LSD) was applied. The results show that there was a statistically significant mean difference in comparisons

of 120 vs. 24 ( $p < .001$ ) and 120 vs. 60 ( $p < .05$ ). However, the comparison between choice set 24 and choice set 60 was found only at the marginal level of significance ( $p = .057$ ). Although the results showed that the comparison between small choice set (24) and medium choice set (60) was marginal, the means shown in Table 11 exhibited that the manipulation worked. Consumers did notice and perceive more products in the large choice set (120) and perceive fewer products in the smaller choice set (24).

Table 11 Mean and Standard Deviation on the Measure of Perceived Number of Choices as a Function of Groups.

Condition	n	Perceived Number of Choices		Minimum	Maximum
		Mean	Std. Deviation		
24	134	3.50	1.23	1	7
60	119	3.80	1.23	1	7
120	129	4.26	1.27	1	7

Note: 1 (Strongly Disagree) to 7 (Strongly Agree).

Table 12 One-Way ANOVA of Perceived Amount of Selection by Choice Sets.

Source	df	SS	MS	F	<i>p</i>
Between Groups	2	37.97	18.99	12.30	.000
Within Groups	379	585.22	1.54		
Total	381	623.19			

### Scale Dimension and Internal Reliability

The online questionnaire consisted of questions adopted from previous studies as well as those developed based on the focus groups conducted by the researcher prior to collecting the data in Stage 3. The scale dimensions were examined by Principle

Component Analysis (factor analysis) with a Varimax rotation, and the internal reliability was examined with Cronbach's reliability test. The only adopted scale from a previous study was the six-item scale of Fashion Opinion Leadership (Goldsmith, Freiden, & Kilsheimer, 1993). The results confirmed that it was a one-dimensional scale (eigenvalue = 4.39) with a Cronbach's  $\alpha$  of 0.93 for this sample. The eigenvalue of the second factor was 0.52, which showed a weak indication as a dimension.

Next, the 11 items developed by the researcher to measure consumers' product presentation preference in apparel online shopping were examined. Factor analysis was conducted first. Three factors were extracted from the 11 items (Table 13) with eigenvalues above 1. When examining the scree plot (Figure 10), it showed that the elbow cutting point is located at the fourth eigenvalue. The scree plot also indicated that there were three factors among the 11 items. The first factor consisted of five items that represented consumers' preference towards human models (eigenvalue = 4.16). The first factor explained 37.85 percent of the variances in the set of items. The second factor consisted of three items that represented consumers' comfort level without human models displaying the apparel products (eigenvalue = 1.45). The second factor explained 13.14 percent of the variance in the set of items. The third factor consisted of three items that does not show a strong theme among these items (eigenvalue = 1.09). The third factor explained around 9.92 percent of the variance in the set of items. The factor loadings in Table 13 indicated a negative relationship between the two factors.

Table 13 Factor Analysis Results and Item Loadings of Apparel Product Presentation Preference

Item	Factor 1	Factor 2	Factor 3
Typically, products look best when they are on human models.	<b>.586</b>	-.025	.415
I prefer to see all products displayed on human models.	<b>.689</b>	-.389	.054
It is easier for me to predict how a product will look on me when I see it on a human model than other types of displays.	<b>.787</b>	-.123	.134
Presenting a product on a human model helps me make my purchase decision.	<b>.861</b>	-.193	.049
I feel more confident selecting a product to purchase when the product is displayed on a human model.	<b>.873</b>	-.146	.112
I do not need to see the products on human models to make a purchase decision.	-.392	<b>.557</b>	.155
I do not have a preference as to whether apparel products are displayed on human models, mannequins, or by themselves on a website.	-.376	<b>.705</b>	-.017
I prefer to see all products displayed by themselves (not on human models or mannequins).	-.056	<b>.757</b>	-.213
I like that I could view all products on one page.	.158	-.141	<b>.657</b>
Typically, human models on apparel websites are attractive.	.388	.109	<b>.593</b>
Just because a product looks good on the model does not mean that it will look good on me.	-.095	-.046	<b>.757</b>
Eigenvalue	4.163	1.445	1.091
% of Variance	37.848	13.139	9.917
Cronbach's $\alpha$	.866	.709	.512

Note: N = 382.

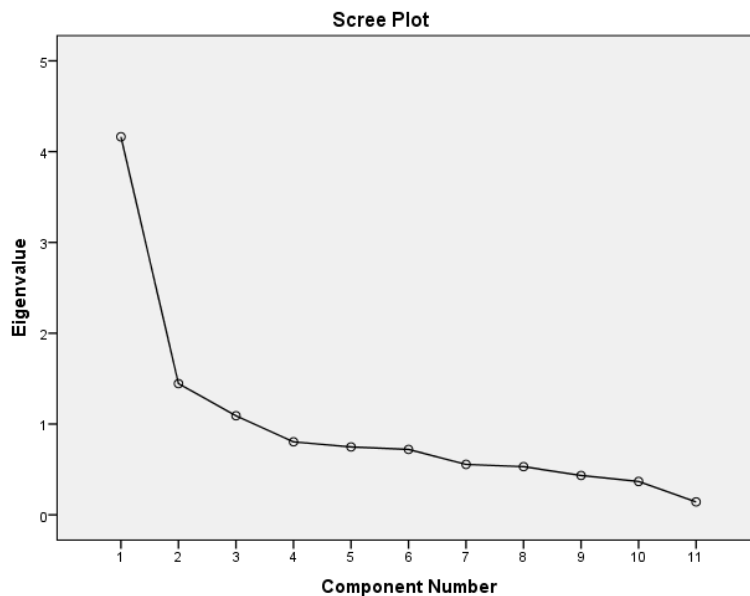


Figure 10 Scree plot of Factor Analysis on Apparel Product Presentation Preference

The researcher further examined the 21 items that were developed to measure the consumers' attitude towards the website and the retailer in the nine different conditions of numbers of apparel products and types presentations. The result of factor analysis (with a Varimax rotation) showed that the 21 items contained four factors with an Eigenvalue above 1 (Table 14). The scree plot (Figure 11) indicated that the first three factors were more prominent dimensions, and the fourth factor was relatively weak. Beyond the fourth factor, the slope flattened out. When examining the factors, the researcher recognized that the ABC attitude model could serve as the theoretical baseline to explain the dimensions extracted from the responses. In the following, the researcher presented the result of the factor analysis and named the factors after the ABC attitude model.

The first factor consisted of seven items that represented the cognitive component of attitude. Based on its definition, the cognitive component refers to knowledge

structures and perceptual responses (Breckler, 1984). The items clustered in this factor showed respondents' knowledge structure towards the website and the choice. The items, such as "I liked the website design," "I thought it was fun to browse through the tops on the website," "It was difficult to make my decision because I found more than one top I like," and "This top is the item that if I did not buy it now, I would keep thinking about it," indicated that the respondents had formed their evaluative responses based on the cognitive thinking process that formed their attitude towards the website and the products. Thus, the researcher named the first factor as "Cognitive." The Eigenvalue of factor 1 was 5.61, and it explained 26.72 percent of the variances. Cronbach's  $\alpha$  of Factor 1 was 0.83.

The second factor consisted of six items, and it represented the behavioral component of attitude. The definition of behavioral component refers to one's overt actions and intentions (Breckler, 1984). In this study, the items clustered under this factor reflect participants' responses towards the choice/decision making activity. The items that represented the variable include "During this process, I wanted to give up on searching for a top to select," "I felt bored going through the products on the website," and "If I were to actually purchase the top I selected, it is likely that I would regret my decision." The set of items reflected some behavioral intentions during the decision making process, such as "If I were to actually purchase the top..." and "...I wanted to give up." Additionally, some items represented the evaluative responses on a behavioral basis, such as the negative responses derived from the activity of making a choice (i.e., "...did not provide a good selection."). Among these items, it was unexpected to find that the item, "If I were to actually purchase the top I selected, it is likely that I would regret

my decision,” fell into this dimension. It seems not to have a direct association with a behavior or behavioral intention. However, there was no cross loading with this item. The explanation of this finding might be that the description of the item implied the regret towards the purchase behavior. Thus, this item fell into this dimension. The second factor was named as “Behavioral.” The eigenvalue of the factor was 3.18, and it explained 15.12 percent of the variance in the set of items with a Cronbach’s  $\alpha$  of 0.84.

The third factor consisted of three items and represented the affective component of attitude directly associated with the number of choices. The definition of affective component refers to emotions and feelings (Breckler, 1984). The items clustered in this factor include the feelings such as “I felt lost because there are too many options on the website,” “I felt overwhelmed with the number of products on the website,” and “I have difficulty remembering the different options that were available on the webpage I viewed.” As a result, the second factor was named as “Affective.” The eigenvalue of this factor was 1.65. It explained 7.87 percent of the variances with a Cronbach’s  $\alpha$  of 0.79.

The fourth factor seemed to consist of five items. The item, “It was difficult to evaluate the tops when I was trying to make a decision,” was excluded because of its cross loadings on Factor 3 and 4. The fourth factor possessed an eigenvalue 1.16 and explained 5.52 percent of variance. However, the reliability result was lower than the acceptable level 0.7 (Cronbach’s  $\alpha = .59$ ). All the items in the factor reflected respondents’ wish to obtain some types of help to overcome their cognitive overload and make a choice decision. The items included “I wish I could have seen customer reviews for each top,” “I wish I could have used filters to find the style I like,” “I wish there was a quick view window,” and “I wish there were more views of each garment when trying to

make a decision.” Although this factor represented another cognitive component of attitude, the fourth factor was excluded in the following analyses, due to its weak indication of a dimension in the factor analysis and low reliability.

Table 14 Factor Analysis Results and Item Loadings of Internal Responses: Affective, Behavioral, and Cognitive

Item	Factor 1	Factor 2	Factor 3	Factor 4
62-5_If this top was actually available for purchase, I would buy it for myself.	<b>.569</b>	-.406	.080	.045
63-1_I thought it was fun to browse through the tops on the website.	<b>.693</b>	-.235	-.227	.042
63-3_I liked the website design.	<b>.703</b>	-.033	-.262	-.013
63-6_I would be willing to register with this retailer in order to proceed to check out and purchase a top from this site.	<b>.680</b>	-.183	.061	-.233
64-4_It was difficult to make my decision because I found more than one top I like.	<b>.726</b>	-.297	.186	.103
64-5_I needed to make some trade-offs in deciding which top I should select.	<b>.608</b>	-.079	.120	.292
64-6_This top is the item that if I did not buy it now, I would keep thinking about it.	<b>.725</b>	-.101	.180	-.185
61-1_I felt overwhelmed because many of the products seem very similar to one another.	.049	<b>.676</b>	.272	.062
61-3_I felt bored going through the products on the website.	-.354	<b>.649</b>	.196	.082
61-6_If I were to actually purchase the top I selected, it is likely that I would regret my decision.	-.190	<b>.676</b>	.106	.173

Item	Factor 1	Factor 2	Factor 3	Factor 4
62-6_I was frustrated because the assortment of products did not provide a good selection.	-.267	<b>.722</b>	-.013	.202
64-1_If I were actually shopping for a top, I would not purchase a top from this site.	-.267	<b>.682</b>	.105	.105
64-2_During this process, I wanted to give up on searching for a top to select.	-.235	<b>.645</b>	.431	-.007
62-3_I felt lost because there are too many options on the website.	.049	.180	<b>.838</b>	.052
62-4_I have difficulty remembering the different options that were available on the webpage I viewed.	.078	.202	<b>.617</b>	.258
63-5_I felt overwhelmed with the number of products on the website.	.007	.147	<b>.839</b>	.074
63-4_It was difficult to evaluate the tops when I was trying to make a decision.*	.011	.292	.369	.391
61-2_I wish I could have seen customer reviews for each top.	-.051	-.012	.257	<b>.583</b>
61-5_I wish there was a quick view window.	.018	.148	-.193	<b>.629</b>
62-2_I wish I could have used filters to find the style I like.	.006	.133	.211	<b>.570</b>
64-3_I wish there were more views of each garment when trying make a decision.	-.006	.075	.061	<b>.738</b>
Eigenvalue	5.611	3.175	1.652	1.160
% of Variance	26.718	15.118	7.867	5.523
Cronbach's $\alpha$	.829	.840	.788	.588*

Note: N = 382. \* Question "It was difficult to evaluate the tops when I was trying to make a decision" was deleted in the reliability test and later analyses due to its cross loading.

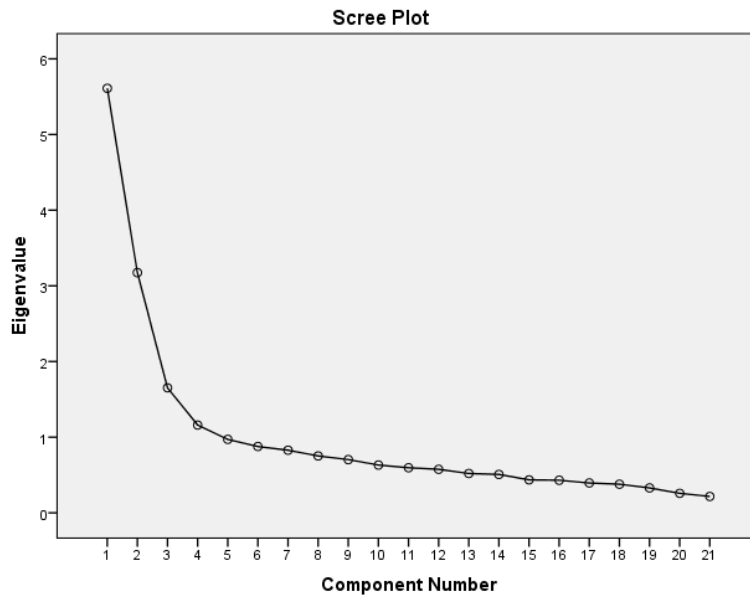


Figure 11 Scree plot of Factor Analysis on Internal Responses

### Main Effects and Interactions

After confirming the internal and external validity of the experiment through the manipulation checks and identifying the potential variables by factor analysis, a number of statistical analyses were performed to test the hypotheses. In this analysis, the researcher also included four control variables, Online Shopping Frequency, Perceived Variety, Self-Perception, and Fashion Opinion Leadership. All of them were continuous variables. The researcher performed a two-way ANCOVA to examine main effects ( $H_{1s}$ ) and interactions ( $H_{2s}$ ). The dependent variables (internal responses) were the three factors, Affective, Behavioral, and Cognitive, extracted from the factor analysis. These three variables were generated by averaging the scores of all the items clustered in each factor respectively.

H<sub>1</sub> was developed to test the relationships between the number of choices (24 vs. 60 vs. 120) and the three dependent variables of internal responses. Thus, Hypothesis 1 consisted of two parts as follows: 1) the overall prediction and 2) the direction of the prediction.

H<sub>1</sub>: Affective, behavioral, and cognitive responses will vary as a function of number of choices.

- a. A higher number of choices will result in higher levels of negative *affective* responses.
- b. A higher number of choices will result in higher levels of negative *behavioral* responses.
- c. A higher number of choices will result in lower levels of positive *cognitive* responses.

To examine Hypothesis 1, three two-way ANCOVA tests were conducted. The two-way ANCOVA tests showed that the main effect of the number of choices on Affective responses was statistically significant,  $F(8, 373) = 17.18, p < .001, \eta^2 = .09$  (Table 15), but that of the product presentation consistency was not significant,  $F(8, 373) = 2.51, p = .08, \eta^2 = .01$ . Although the Levene's test of equal variance was statistically significant ( $p = .037$ ), with the number of groups and sample size, which meant that the variance in the groups were unequal, the ANCOVA test was deemed robust. The result indicated that the greater the number of choices the respondents were exposed to, the higher their negative affective responses were. Thus, H<sub>1a</sub> was supported.

The *Post Hoc* tests, Fisher's Least Significant Difference (LSD) were included to conduct the pairwise comparisons. The results showed that all the pairs (24 vs. 60; 24 vs.

120; 60 vs. 120) were statistically significant at the levels of  $p < .01$  or  $p < .001$ . In addition, one of the four control variables, online shopping frequency, was statistically significant ( $p < .05$ ). The means and standard deviations of the dependent variables are presented in Table 16.

$H_{1b}$  was supported as well. The results showed that the main effect of the number of choices on Behavioral responses was statistically significant,  $F(8, 373) = 3.97, p < .05, \eta^2 = .02$  (Table 15). This indicated that the higher the number of choices the respondents were exposed to, the higher their negative behavioral responses were. In addition, the control variable, perceived variety, was significant ( $p < .001$ ). The means and standard deviations of the dependent variables were presented in Table 16, Table 17, and Table 18.  $H_{1c}$  was rejected. The results showed that the main effect of number of choices on Cognitive responses was not significant,  $F(8, 373) = 1.96, p = .001, \eta^2 = .01$ . The main effect of product presentation format was not significant as well,  $F(8, 373) = 2.27, p = .10, \eta^2 = .01$ .

Table 15 Two-Way ANCOVA Results

		Dependent Variable									
Independent Variable		Affective			Behavioral			Cognitive			
		df	F	p	$\eta^2$	F	p	$\eta^2$	F	p	$\eta^2$
Main Effect											
Number of Choices	2	<b>17.18***</b>	<b>.000</b>	.09	<b>3.97*</b>	<b>.020</b>	.02	1.96	.143	.01	
Product Presentation Format	2	2.51	.083	.01	1.75	.175	.01	2.27	.104	.01	
Interaction											
Number of Choices X Product Presentation Format	4	.50	.736	.01	.48	.748	.01	.48	.752	.01	
Control Variable											
Fashion Leader	1	1.31	.253	.00	1.22	.271	.00	1.23	.268	.00	
Perceived Variety	1	3.04	.082	.01	<b>95.24***</b>	<b>.000</b>	.21	<b>106.78***</b>	<b>.000</b>	.22	
Identity	1	3.88	.050	.01	.59	.445	.00	.30	.585	.00	
Online Shopping Freq.	1	<b>5.81*</b>	<b>.016</b>	.02	2.42	.121	.01	.02	.876	.00	

Note. N = 382. \* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* =  $p < .001$ .

Table 16 Means and Standard Deviations for the Dependent Variable, Affective by Number of Choices

Consistency of Product Presentation	Number of Choices								
	24			60			120		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Model	2.94	1.16	45	3.48	1.09	37	4.06	1.24	46
Flat	2.61	0.86	45	3.22	1.48	35	3.76	1.39	41
Hybrid	3.11	1.16	44	3.43	1.38	47	3.91	1.45	42
Total	2.88	1.08	134	3.38	1.32	119	3.91	1.35	129

Note: N = 382. \*The variable, Affective, is computed as the mean of the following three items: "I felt lost because there are too many options on the website," "I have difficulty remembering the different options that were available on the webpage I viewed," and "I felt overwhelmed with the number of products on the website."

Table 17 Means and Standard Deviations of the Dependent Variable, Behavioral by Number of Choices and Format of Product Presentation

Format of Product Presentation	Number of Choices								
	24			60			120		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Model	3.84	1.18	45	4.27	1.37	37	4.01	1.21	46
Flat	3.79	1.23	45	3.82	1.16	35	3.95	1.41	41
Hybrid	3.95	1.21	44	3.82	1.19	47	3.85	1.08	42
Total	3.86	1.20	134	3.96	1.25	119	3.94	1.23	129

Note: N = 382. \*The variable, Behavioral, is computed as the mean of the following six items: "I felt overwhelmed because many of the products seem very similar to one another;" "I felt bored going through the products on the website;" "If I were to actually purchase the top I selected, it is likely that I would regret my decision;" "I was frustrated because the assortment of products did not provide a good selection;" "If I were actually shopping for a top, I would not purchase a top from this site;" and "During this process, I wanted to give up on searching for a top to select."

Table 18 Means and Standard Deviations of the Dependent Variable, Cognitive by Number of Choices and Format of Product Presentation

Format of Product Presentation	Number of Choices								
	24			60			120		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Model	3.80	1.25	45	3.60	1.14	37	3.65	1.07	46
Flat	3.80	1.16	45	3.99	1.11	35	3.80	1.11	41
Hybrid	3.66	1.01	44	3.49	0.98	47	3.88	1.02	42
Total	3.75	1.14	134	3.67	1.08	119	3.84	1.06	129

Note: N = 382. \*The variable, Cognitive, is computed as the mean of the following seven items: "If this top was actually available for purchase, I would buy it for myself;" "I thought it was fun to browse through the tops on the website;" "I liked the website design;" "I would be willing to register with this retailer in order to proceed to check out and purchase a top from this site;" "It was difficult to make my decision because I found more than one top I like;" "I needed to make some trade-offs in deciding which top I should select;" and "This top is the item that if I did not buy it now, I would keep thinking about it."

The control variable, Online Shopping Frequency, exhibited a significant relationship with Affective,  $F(8, 373) = 5.81, p < .05, \eta^2 = .02$ . There was a positive correlation between Affective and Online Shopping Frequency (*Pearson's*  $r = .11, p < .05$ ) (Table 19). Perceived Variety exhibited significant relationships with both Behavioral ( $F(8, 373) = 95.24, p < .001, \eta^2 = .21$ ) and Cognitive ( $F(8, 373) = 106.78, p < .001, \eta^2 = .22$ ). There was a negative correlation between Perceived Variety and Behavioral (*Pearson's*  $r = -.43, p < .001$ ), whereas the correlation between Perceived Variety and Cognitive was positive (*Pearson's*  $r = .46, p < .001$ ). The results showed that Fashion Opinion Leadership and Self-Perception exhibited no statistical significant influence on the three dependent variables. It was noted that the correlations between Behavioral and Fashion Opinion Leadership as well as Behavioral and Online Shopping

Frequency were marginally significant (Table 19), but the relationships were not confirmed in the two-way ANCOVA tests.

Table 19 Variable Inter-Correlations

	Affective	Behavioral	Cognitive	Perceived Variety	Fashion Leader	Online Shopping Freq.	Self-Perception
Affective Significance	1.000						
Behavioral Significance	<b>.396<sup>***</sup></b> .000	1.000					
Cognitive Significance	.018 .732	<b>-.492<sup>***</sup></b> .000	1.000				
Perceived Variety Significance	<b>.164<sup>**</sup></b> .001	<b>-.427<sup>***</sup></b> .000	<b>.464<sup>***</sup></b> .000	1.000			
Fashion Leader Significance	.026 .617	<b>.101<sup>*</sup></b> .49	.080 .116	.019 .717	1.000		
Online shopping Freq. Significance	<b>.108<sup>*</sup></b> .035	<b>.110<sup>*</sup></b> .032	.034 .505	-.019 .706	<b>.349<sup>***</sup></b> .000	1.000	
Self-Perception Significance	.094 .067	.057 .267	.064 .210	.035 .494	<b>.391<sup>***</sup></b> .000	.082 .109	1.000

Note: N = 382. \* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* =  $p < .001$  (2-tailed).

## Interactions

Hypothesis 2 was developed to test the interactions. The researcher proposed that the formats of product presentations (Model vs. Flat vs. Hybrid) would influence the relationships between the numbers of choices and three dependent variables of the internal responses. Based on the literature review of interface consistency and product presentation format as well as choice overload, Hypothesis 2 was developed. It consisted of the overall prediction and the direction of the prediction, a, b, and c.

H<sub>2</sub>: Affective, behavioral, and cognitive responses will vary as a function of the interaction between number of choices and format of product presentation.

- a. Higher levels of number of choices will result in higher levels of negative affective responses particularly for hybrid format of product presentation.
- b. Higher levels of number of choices will result in higher levels of negative behavioral responses particularly for hybrid format of product presentation.
- c. Higher levels of number of choices will result in higher levels of positive cognitive response particularly for hybrid format of product presentation.

In regard to Hypothesis 2, the results of interactions showed that none of the interactions were significant (Table 15). The main effect of the number of choices on the Affective variable was not impacted by the product presentation format,  $F(8, 373) = .50$ ,  $p = .74$ ,  $\eta^2 = .00$ . The main effect of the number of choices on the Behavioral variable was not influenced by the product presentation format,  $F(8, 373) = .48$ ,  $p = .75$ ,  $\eta^2 = .01$ . The main effect of the number of choices on the Cognitive variable was not influenced by the product presentation format,  $F(8, 373) = .48$ ,  $p = .75$ ,  $\eta^2 = .01$ . Therefore, Hypothesis 2

was rejected, which resulted in the sub-hypotheses,  $H_{2a}$ ,  $H_{2b}$ , and  $H_{2c}$ , being rejected as well.

### **Hierarchies of Effects**

In Hypothesis 3, the researcher proposed a hierarchical relationship among the variables of internal responses based on the theory of the ABC model. That is, a person's attitude is a process that is based on three learning hierarchies, a) Cognitive information processing: Cognition → Affect → Behavior, b) Behavioral learning processing: Cognition → Behavior → Affect, and c) Experiential processing: Affect → Behavior → Cognition (Solomon, 2013) (see detailed introduction in Chapter 2). The fact that the statistically significant relationships between the independent variable (number of choices) and the Affective as well as Behavioral variables derived in the previous ANCOVA analysis implied that the respondents formed their attitude through the experiential learning process.

To statistically examine the attitude formation ( $H_3$ ) and its impact on the outcome ( $H_4$ ), SEM was conducted using Mplus Version 7.11. Although the variables in the model were measured variables (with a single value), not latent variables, SEM was applied as it was recommended by researchers when assessing more complicated mediation models, such as the model with serially linked mediators (Preacher & Hayes, 2004). The proposed model in this study exhibited three mediators, Affective, Behavioral, and Cognitive. Therefore, SEM was a better statistical approach to analyze the model. Furthermore, due to the outcome variable (subscribing to the mailing list) proposed by this study being a binary variable, the researcher ran two SEM analyses to obtain more information about attitude formation. In the first SEM analysis, the number of choices was the exogenous

variable, and the other three variables (Affective, Behavioral, Cognitive) were endogenous variables (Figure 12). In addition, Perceived Variety was included as a control variable according to the results of the ANCOVA tests. Thus, the variable, Perceived Variety, was the other exogenous variable in the model, and the paths from “Perceived Variety → Behavioral” and “Perceived Variety → Cognitive” were controlled.

The results of the SEM,  $\chi^2(4) = 15.35, p < .01$ , CFI = .97, TLI = .94, RMSEA = .09, SRMR = .05, demonstrated a good model fit for testing the hypothesis (Hu & Bentler, 1999). Suggested by Hu and Bentler (1999), the appropriate cutoff criteria for the model fit is .95 for CFI and TLI, .06 for RMSEA, and .08 for SRMR. Thus, no model indices were used to readjust the model, and  $H_3$  was supported. There was a hierarchical relationship among the variables in internal responses. In the context of apparel online shopping, the attitude formation process was on the basis of experiences. Furthermore, the  $R^2$  of the model was .33. The model results with the estimated coefficients are reported in Table 20, and results of the indirect effects are presented in Table 21.

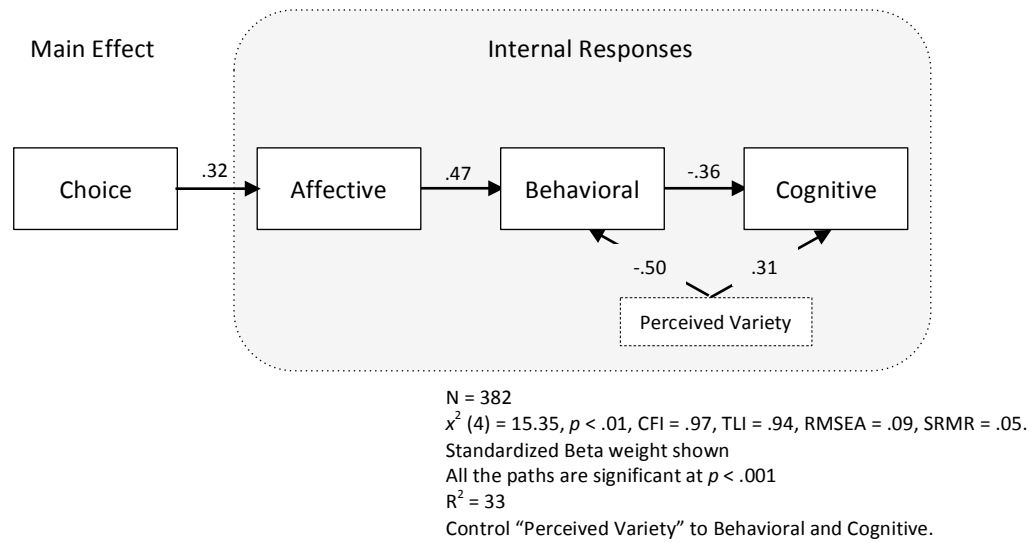


Figure 12 Model with the Endogenous Variable "Cognitive"

Table 20 Unstandardized, Standardized, and Significance Levels for Model in Figure 12 (Standard Errors in Parentheses)

Parameter Estimate	Unstandardized	Standardized	<i>p</i>
<i>Structural Model</i>			
Affective ← Choice	.01 (.00).	.32 (.05)	.00
Behavioral ← Affective	.44 (.04)	.47 (.04)	.00
Behavioral ← Variety	-.38 (.03)	-.50 (.04)	.00
Cognitive ← Behavioral	-.32 (.04)	-.36 (.05)	.00
Cognitive ← Variety	.21 (.03)	.31 (.05)	.00
Residual for Affective	1.56 (.11)	.90 (.03)	.00
Residual for Behavioral	.88 (.06)	.57 (.04)	.00
Residual for Cognitive	.81 (.06)	.67 (.04)	.00

Note: N = 382. Model fit:  $\chi^2(4) = 15.35, p < .01, CFI = .97, TLI = .94, RMSEA = .09, SRMR = .05$ .  
 Control Variable: Perceived Variety.

Table 21 Unstandardized and Standardized Indirect Effects (Exogenous Variable: Cognitive)

Path	Unstandardized	Standardized
“Cognitive” as the Exogenous Variable		
Behavioral		
← Affective ← Choice	.01***	.15***
Cognitive		
← Behavioral ← Affective	-.14***	-.17***
← Behavioral ← Affective ← Choice	-.001***	-.06***

Note: N = 382. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

The result of H<sub>3</sub> provided evidence confirming the hierarchy of attitude formation processing in the context of apparel online shopping when facing choice overload. This experiential hierarchy shaped the attitude towards the product and/or website.

Furthermore, the researcher aimed to measure the behavioral responses as a result of attitude formation. Therefore, H<sub>4</sub> was developed to measure the relationship between the Cognitive and the Behavioral response (subscribing to an Email mailing list). In the second SEM, the outcome variable related to the behavioral response was added into the model (Figure 13). The SEM analysis was conducted with a control variable, *Perceived Variety*.

The results of the Logistic SEM provided by Mplus were different and limited compared to the general SEM due to the binary exogenous variable, subscribing to the mailing list (Email), with “0” as “no, they do not want to receive emails from the retailer” and “1” as “yes, they would like to receive emails from the retailer.” The result of the model fit was  $\chi^2(8) = 19.02, p < .05$ , CFI = .97, TLI = .94, RMSEA = .06. This model fit was similar to the previous model’s result. It demonstrated an appropriate model fit for

testing the hypothesis (Hu & Bentler, 1999). No model indices, thus, were used to readjust the model. The unstandardized results and the standardized coefficients are presented in Table 22.

Based on the results,  $H_4$  was supported. There is a positive relationship between scores on cognitive attitude formation and “subscribing to a mailing list” (Email). However, while interpreting Logistic SEM, the unstandardized coefficient in Table 22 refers to a *log* coefficient. In order to interpret the *log* coefficient, it was converted to the odds ratio. The odds ratio was obtained by exponentiating the coefficient .409. The exponentiated coefficient was 1.51, which implied that for a one-unit increase in the Cognitive attitude formation score, an increase of about 51% in the odds of signing up for the mailing list was expected to be observed. The unstandardized results and the standardized coefficients are presented in Table 23.

In summary, the results supported  $H_{1a}$ ,  $H_3$ , and  $H_4$ , whereas  $H_{1b}$ ,  $H_{1c}$ , and  $H_{2s}$  were rejected. In the next chapter, the researcher discusses the rationales and analyses of the findings. Moreover, the researcher further discusses the implications of the findings for both apparel marketers and consumer behavior researchers.

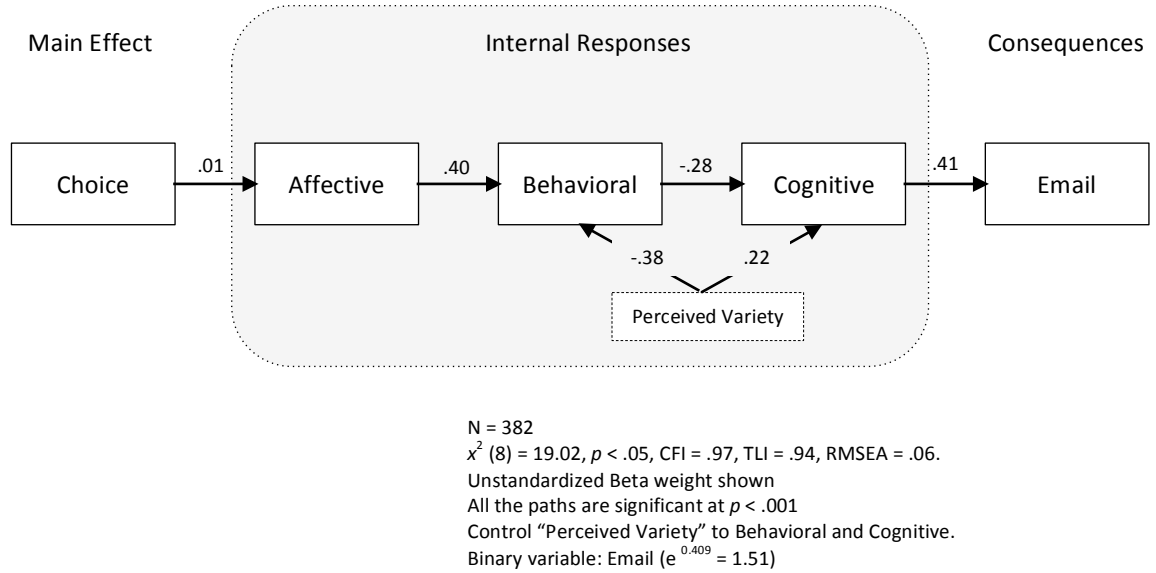


Figure 13 Model with the Endogenous Variable: Subscribing to the Mailing List

Table 22 Unstandardized, Standardized, and Significance Levels for Model in Figure 13 (Standard Errors in Parentheses)

Parameter Estimate	Unstandardized	Standardized <sup>a</sup>	<i>p</i>
<i>Structural Model</i>			
Affective ← Choice	.01 (.00).	.31	.00
Behavioral ← Affective	.40 (.04)	.42	.00
Behavioral ← Variety	-.38 (.03)	-.45	.00
Cognitive ← Behavioral	-.28 (.04)	-.31	.00
Cognitive ← Variety	.22 (.03)	.33	.00
Email ← Cognitive	.409 (.10) <sup>b</sup>	.44	.00
Residual for Affective	1.54 (.11)	.90	.00
Residual for Behavioral	1.00 (.08)	.65	.00
Residual for Cognitive	.84 (.06)	.71	.00

Note: N = 382. a. Standardized standard errors were not reported in Mplus. b. This is the log value, thus, the odd ratio is  $e^{0.409} = 1.51$ . Model fit:  $\chi^2 (8) = 19.02, p < .05, CFI = .97, TLI = .94, RMSEA = .06$ . Control Variable: Perceived Variety.

Table 23 Unstandardized and Standardized Indirect Effects (Exogenous Variable: Email)

Path	Unstandardized	Standardized
“Email” as the Exogenous Variable		
Behavioral		
← Affective ← Choice	.004 <sup>***</sup>	.131 <sup>***</sup>
Cognitive		
← Behavioral ← Affective	-.001 <sup>***</sup>	-.132 <sup>***</sup>
← Behavioral ← Affective ← Choice	-.111 <sup>***</sup>	-.041 <sup>***</sup>
Email		
Cognitive ← Behavioral	-.113 <sup>***</sup>	-.371 <sup>***</sup>
Cognitive ← Behavioral ← Affective	-.045 <sup>***</sup>	-.058 <sup>***</sup>
Cognitive ← Behavioral ← Affective ← Choice	.000 <sup>**</sup>	-.018 <sup>**</sup>

Note: N = 382. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

The present research study was designed to test the proposed theoretical model of the influence of choice overload on internal responses/attitude formation and behavioral responses in the specific context of apparel online shopping (Figure 14). The researcher aimed to investigate the attitude formation process from a theoretical viewpoint and to identify an online product presentation format that could mitigate the negative outcomes of choice overload. In this chapter, the researcher provides a discussion of the findings in this study, conclusions, limitations of the present study, and recommendations for future research.

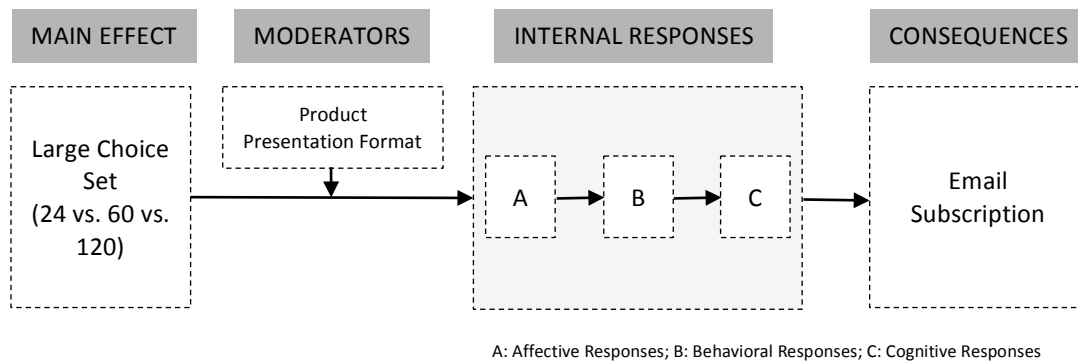


Figure 14 Tested Model

### **Number of Choices and Internal Responses**

The proposed model reflects a main effect for number of choices and the three internal responses: affective, behavioral, and cognitive responses (attitude formation). The findings showed a larger number of choices would result in increased negative feelings (affective responses) during the decision making process of selecting a clothing item (top) in an online setting. Respondents' affective responses included feeling more overwhelmed when being given a large choice set, having greater difficulty in remembering the options, and feeling lost because of having too many choices. A large choice set seems to be more likely to lead to negative emotions. Furthermore, a significant relationship also was found between the number of choices and behavioral responses. Whereas respondents in the present study felt overwhelmed from simply being exposed to too many options, facing choice overload also significantly increased respondents' negative responses towards the decision-making activity. The greater the number of choices to which they were exposed, the more they wanted to give up on searching, exhibited the tendency of regretting after their decision, or have a decreased intention to conduct the activity (choosing a top).

These findings imply that the large choice set has a direct impact on both consumers' feelings and behavioral responses towards the activity. Consumers may be more likely to give up the evaluative activity and choose to defer their decision-making. As a result, online apparel retailers may want to pay more attention to how to provide a good product arrangement in relation to the number of the products presented on one page. Some websites, such as MANGO (Mango.com, 2016), have adopted the feature of infinite scrolling, which does not show the total number of items or number of product

pages to shoppers. This endless scrolling feature might be detrimental to consumers' shopping experience when facing an extensive selection based on the finding. Recent technology developments, such as smart phones and tablets, might have prodded MANGO to consider that the increased number of users that browse its website through mobile devices necessitated a consistent interface across devices, thus providing convenience and consistency through a scrolling feature that does not require consumers to click on a particular button to change the websites. However, the present study shows that with a large product assortment, it might not be an ideal method to provide consumers too much choice on one web page when using a laptop or desktop. Although it is important to design consistent websites that allow consumers to transfer their experience across devices, this is a case that shows not every feature can be integrated. Consequently, an additional issue of considerable importance for marketers to pay more attention to is developing an understanding of how consumers use each device. For laptop and desktop interface, consumers may prefer to view around 60 to 90 items on one web page.

In contrast to these significant results for affective and behavioral internal responses, the finding for cognitive responses was not statistically significant. Cognitive responses refer to knowledge structures and perceptual responses (Breckler, 1984). In this case, forming knowledge-based responses, such as being willing to stay connected with the retailer or forming favorable beliefs towards the product choice and the website, may not result from being exposed to choice overload. As discussed in Chapter 2, attitudes can be formed on the basis of affective, behavioral, and cognitive responses individually or through a hierarchy of these internal responses. Thus, this finding suggests that

consumers' attitude towards the product assortment is likely formed on the basis of affective responses as well as behavioral responses in the process of making a decision. These responses further influence the development of beliefs. This finding provided a preliminary confirmation on the hypothesis that the attitude formation may be a hierarchical process in this specific context (online shopping scenario).

Furthermore, the researcher controlled four variables (online shopping frequency, perceived variety, identity perception, and fashion leadership) in the analysis of variance. Among these variables, online shopping frequency showed a positive relationship with affective responses, such as the feeling of being overwhelmed, lost, and general difficulties with remembering the options provided. One of the explanations might be that these frequent shoppers have higher expectations of website designs and navigations as well as being more website-savvy in terms of being familiar with the tools they could utilize to facilitate their decision making. Therefore, they exhibited higher negative affective reactions as the number of choices increased because they were not able to use these tools, such as filters and quick views, to help them to evaluate the products. This finding is consistent with the findings of Rhee, Moon, and Choe (2006) who found that compared to novice users of e-learning websites, skilled users of e-learning websites were more likely to be distracted by physically inconsistent web pages.

### **Product Presentation Formats**

Currently, some online apparel retailers (e.g., GAP [Gap.com, 2016], FOREVER21 [Forever21.com, 2016]) present all thumbnail images of apparel products on human models, while other online apparel retailers (e.g., TOPSHOP [Topshop.com,

2016], BODEN [Boden.com, 2016]) presented their products with mixed images of human models and flats. Sometimes, due to the extensive product assortment, the cost of the photo-shoot with human models, as well as the time-consumption for the task, a company may not be able to have all the products photographed on a human model. Thus, it is common to see the hybrid format.

However, the literature on interface consistency and the results from the focus groups imply that the ideal presentation format would be presenting “all” the styles with “human models.” With human models, the attributes of the product would be easier to evaluate and a consistent presentation would reduce cognitive load. Thus, the researcher proposed that the consistent presentation format (all models and all flats) would mitigate choice overload. However, the findings showed no statistically significant main effect of product presentation formats on the affective, behavioral, and cognitive responses; but unexpectedly neither did the interactions between product presentation formats and the number of choices. The findings indicated that how the products were presented did not have a direct impact on consumers’ affective, behavioral, and cognitive responses during the decision-making process of selecting a top in an online shopping context.

Additionally, the product presentation consistency had no influence on the too-much-choice effect. Although female students in the focus groups also mentioned unfavorable attitudes toward inconsistent product presentations, product presentation formats were not found to be a key factor in participants’ attitude formation while making a choice in the context of selecting a top online.

The reason for the non-significant interaction effects might be that tops were identified as the most frequently purchased product category online among the

respondents. With many previous online purchasing experiences, respondents may have developed an evaluation mechanism to make judgments on the suitability of the tops, such as fit, lengths, and silhouettes. As a result, whether the products were presented all in flats, on human models, or in the hybrid format was not the main issue that influenced their attitudes towards the choice and the decision making process. Rhee, Moon, and Choe (2006) indicated that providing interactivity and usability in an e-learning website is as important as offering a consistent interface, and interface consistency alone does not guarantee the best web-based e-learning system. Therefore, for apparel retailers, presenting apparel products in the hybrid format may be as effective as displaying the products on all human models or flats formats. It may be more important to develop some tools or designs that help consumers narrow down their options or reduce the impact of the choice overload.

### **Experiential Hierarchy**

One of the objectives of the present study was to identify the type of learning process for attitude formation in the specific context. The results of the ANCOVA studies indicated a direct effect of choice load on affective and behavioral responses. The respondents acted on the basis of affective reactions when facing choice overload, which, according to the ABC model of attitudes, is the experiential hierarchy of effects (Affective → Behavioral → Cognitive). The experiential hierarchy emphasized intangible attributes, such as package design, brand names, and the nature setting in which the experience occurs (Solomon, 2013).

In the present study, the researcher proposed that the respondents reacted to the large choice set directly on the basis of feelings and emotions, and then they generated responses towards the activity form. At this point they finally formed the knowledge and beliefs regarding the product or the brand. The SEM results confirmed the researcher's hypothesis that attitude formation exhibited a hierarchical process of internal responses. As apparel shopping experiences are usually associated with the concept of hedonic consumption (consumers enjoy and focus more on the experience during the shopping process than the utility of the products), a good model fit when adopting the sequence of experiential hierarchy of effects was expected to be observed. The negative affective responses turned into negative responses towards the activity, and, in turn, led to fewer positive beliefs towards the choice and website.

Currently apparel e-commerce websites have tools, such as a quick view window, the ability to filter by color, price, size, and styles, as well as new arrivals, to facilitate consumers' shopping and decision making processes. However, to those who do not have a specific product in mind while browsing the website, offering too many choices may lead to choice overload and fewer favorable responses toward the retailer and the product. Therefore, for companies, not only is the arrangement of the total products on the page an important issue to consider in developing visual merchandising strategies but also the tools that can be used for product comparisons, such as those that can highlight the special details of the product to help consumers on their evaluation process.

### **Subscribing to the Mailing List**

As the researcher was interested in the impact of the attitude formation on consumers' actual behaviors, respondents were asked if they would subscribe to an email mailing list. The respondents were told that this was "real" marketing research for a new apparel retailer. If they were interested in receiving more information regarding the products from the retailer in the future, they could sign up for the mailing list by checking the "yes" box. A "no" box was also offered in case they preferred to decline instead.

Because this question is a binary variable, a logistic SEM was performed. The findings indicated that whereas the indirect effect from the number of choices to subscribing to a mailing list was low, the total effect was amplified by going through the series of mediators. Through the attitude formation, the SEM model showed that the higher positive cognitive responses a consumer has toward the product and the website, the more likely it is that she would sign up for the mailing list. More specifically, increasing positive beliefs toward the product and the website by one unit would increase the odds of consumers signing up for the mailing list by about 50 percent.

The results of this model remind online marketers that the consumers' online experience is driven from an integrated mechanism, the elements of the online interface, (i.e., an icon, a button, a type of layout, and the number of choices presented), and the decision-making process they go through (i.e., the process of product comparisons) are an intertwined relationship and have significant impact on their consequential behaviors. The findings also provide a confirmation of the importance of interface design. Especially for online retailers who want to earn or enhance the brand awareness and brand loyalty in the markets, one effective strategy found in this study is to develop a

well-designed product presentation organization, which may greatly improve consumers' responses towards the brand and the product, such as staying connected with the brand.

### **Perceived Variety**

As mentioned in Chapter 2, consumers have a tendency to seek variety and they enjoy having a reasonable product choice assortment. The findings of this study shows that, as expected, perceived variety was significantly related to behavioral and cognitive responses. Consumers preferred to have options; the more variety they perceived, the more positive responses they have towards the decision making activity. Additionally, when they perceived more variety of the product assortment, respondents exhibited a positive attitude toward the website and the choice. Berger, Draganska, and Simonson (2007), found that the product variety affected consumers' perceived expertise of the brand and further influenced their perception of product quality. Therefore, the findings of the present study have also confirmed the important role of perceived variety in consumers' decision-making process in an additional context.

### **Conclusions**

With the growth of e-commerce, having an e-commerce website has become essential to many businesses. According to the U.S. Department of Commerce (2016), the e-commerce share of total U.S. retail sales in the first quarter of 2016 was 7.8 percent and this represented 15.2 percent growth from the same quarter a year ago. A number of features of e-commerce have led to the growth including global reach, anytime/anywhere convenience, ease in finding product/vendor information, rich media for entertainment

and social networking, fast dissemination of information, and so on (Turban, King, Lee, Liang, & Turban, 2012). As visual merchandising is important to brick-and-mortar stores, online visual merchandising is also vital to online retailers because of the nearly unlimited “space” in the cyber environment for presenting products and information. Online visual merchandising is a higher stakes environment because it only takes consumers “one click” to leave/close the store/website. With the nearly unlimited space, how to efficiently arrange the product and information so that consumers find what they want and not feel overwhelmed by the large numbers of images and text blocks as well as how to grab consumers’ attention before they get tired of the website have become important issues to online retailers.

In the model proposed by the researcher the outcomes resulting from the number of products offered were related to internal and behavioral responses. Previous researchers have identified significant relationships between a large assortment and consequential outcome variables, such as choice deferrals (White & Hoffrage, 2009) and dissatisfaction (Iyengar, Wells, & Schwartz, 2006). Those outcome variables included feelings, such as frustration, and consequences after the decision process, such as actual behaviors (i.e., choice deferrals) and post-feelings (i.e., dissatisfaction). These researchers concluded that having too many choices is demotivating (Iyengar & Lepper, 2000), and sometimes introduces negative outcomes to our life (Schwartz, 2004).

Many researchers have identified the significant relationship between the number of choices and negative outcome variables, but others did not. In the present study, the findings provide a further understanding of the relationship. Based on a review of past literature, the present study proposed a theoretical model of the too-much-choice effect.

Previously, researchers only focused on the influence of the number of choices on numerous outcome variables and moderators. Thus, how consumers form their attitude (internal responses) and how their attitude leads to those outcomes (consequences) was not clear. The proposed model emphasized the internal responses in which consumers form their attitude when facing many options as well as on the consequences that resulted from the large choice set through serially linked mediators (Figure 14). The outcome variables examined previously by researchers were categorized into two sections in the model as internal response and consequences. This theoretical model was empirically tested in the context of online apparel shopping.

The process of consumers' attitude formation when facing too many choices was uncovered in this study. An experiential hierarchy was identified in the process of attitude formation. As other researchers found, the number of choices directly influenced the affective responses. The effect of experiential hierarchy provided an appropriate theoretical support to the specific context in that it focused on consumers' hedonic experiences, such as apparel shopping. Thus, this research study helped to unravel the attitude formation process to better understand how the quantity of choices can lead to negative behavioral outcomes.

Whereas an empirical examination was used to support the existing role of internal responses and the mechanism within its formation, the interaction effects were not supported in this study. Moderators of the too-much-choice effect have been examined in other studies as well. The contexts were different, and the results were sometimes inconsistent. Product presentation format was not a significant moderator in the present study. Consumers perhaps have gotten used to the different product

presentation formats. Additionally, while making a purchase decision, the primary concern of consumers may be collecting product information (verbal and visual) that can highlight the uniqueness of each product to facilitate their evaluation process. How the products were presented as a whole (all models vs. all flats vs. hybrid) was not influential on the attitude formation. Therefore, effective online marketing strategies should work on providing tools to help consumers to narrow down the product choices and make a decision as well as shorten task completion time in evaluation, which has been found to significantly increase consumer satisfaction (Mendel, 2010).

To summarize, a theoretical model of the too-much-choice effect that offered a deeper understanding of the mechanism of the effect was proposed. The findings on the attitude formation process when facing choice overload contribute to the existing literature.

### **Limitations**

Before outlining recommendations for future research, the limitations of this study will be described and discussed. First because the sample focused on female college students, the ability to generalize the findings might be limited. Different sample groups and product categories may need distinctive stimuli (number of choices) in the main effect or may show a different response mechanism of attitude formation. For example, the results of this study cannot be used to explain how male college students would respond. Men may react through a low-involvement learning process.

Second, a convenient sample was used, and most of the respondents were students in a College of Business at a West Coast university. The homogeneity of the sample may

bias the results and not provide enough variations in the results. Third, the non-significant interactions may have been a result of the distribution of the human model and flat images in the hybrid format of the experiment stimuli. The distribution of those images was 50 percent human models and 50 percent flats. The equal numbers of the images may end up resulting in an illusion of even distribution and harmony in layout. It is possible that consumers may show different responses when the quantity of one type of product presentation images is reduced which amplifies the inconsistent product presentation. Further research could be conducted to examine how the uneven distribution would influence consumers' perception toward the website. Fourth, the mock websites were developed with no other tools to help consumers filter the products. The lack of interactivity is another limitation in this study.

Regardless of the limitations, the present study empirically tested the proposed theoretical model. Although the product presentation format was found not to be a significant moderator influencing the too-much-choice effect, the findings supported the model structure and helped better understand the process of attitude formation when a consumer is facing too much choice. More studies are needed to examine the model and improve the understanding of the too-much-choice effect.

### **Future Research**

This research study presented a model that provides a baseline for future studies of the too-much-choice effect. In this section, several directions of future studies are suggested. First, this study shows the experiential hierarchy of consumers' attitude formation when facing choice overload. However, the attitudinal learning process among

the affective, behavioral, and cognitive internal responses may vary in a different context. Thus, it would be interesting to apply the model and examine the effect in different fields to investigate whether consumers' attitude formation would go through a different route when facing too much choice in another context.

Second, the effect of the proposed moderator (product presentation formats) on internal responses was not statistically significant. Tops seem to be one of the product categories that consumers would purchase online. Thus, whether the products are presented all on human models, all by themselves, or mixed together in a hybrid format, did not influence consumers' evaluation process. Future studies are needed to identify other moderators that could ease the too-much-choice effect. Moreover, in the future researchers can focus on comparisons on different product categories to examine if the product presentation formats would have an influence on the product that is not often purchased online.

Third, this study focused on one behavioral outcome, subscribing to an email mailing list. The number of choices presented to consumers has an influence on their mailing list subscription through a series of linked mediators. More studies can be conducted to explore the effect of choice overload on different outcome variables, such as post-purchased satisfaction, brand loyalty, word-of-mouth, and what kind of attitude formation process they go through.

Fourth, other researchers can expand on the demographic characteristics of the sample. This present study focused on female college students. To expand the impact of the proposed theoretical model, different sample groups should be examined as well as

different product categories. For example, it would be interesting to conduct this study with male college students and compare the results with the current findings.

## BIBLIOGRAPHY

- Adamson, P. J. & Wallace, F. L. (1997). A comparison between consistent and inconsistent graphical user interfaces, Pre-publication Report, University of Northern Florida, Department of Computer and Information Sciences, Jacksonville, Florida.
- AlTaboli, A., & Abou-Zeid, M. R. (2007). Effect of physical consistency of web interface design on users' performance and satisfaction. In *Human-Computer Interaction. HCI Applications and Services* (pp. 849-858). Springer Berlin Heidelberg.
- Berger, J., Draganska, M., & Simonson, I. (2007). The influence of product variety on brand perception and choice. *Marketing Science*, 26(4), 460-472.
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York, NY: The McGraw-Hill.
- Botti, S. & Iyengar, S. S. (2004). The psychological pleasure and pain of choosing: when people prefer choosing at the cost of subsequent outcome satisfaction. *Journal of Personality and Social Psychology*, 87(3), 312-326.
- Breckler, S. J. (1984). Empirical validation of affect, behavior, and cognition as distinct components of attitude. *Journal of personality and social psychology*, 47(6), 1191.
- Broniarczyk, S. (2006). Product Assortment. In C. Haugtvedt, P. Herr, & F. Kardes (Eds.), *Handbook of Consumer Psychology*. Retrieved from <http://sites.utexas.edu/sbroniarczyk/files/2012/04/Assortment.HandbookConsumerPsychology.broniarczyk20081.pdf>
- Chernev, A. (2003). When more is less and less is more: The role of ideal point availability and assortment in consumer choice. *Journal of Consumer Research*, 30(2), 170-183.
- Diamond, J. & Diamond, E. (2007). *Contemporary visual merchandising environmental design* (4<sup>th</sup> ed). Upper Saddle River, NJ: Prentice Hall.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. New York, NY: Harcourt Brace Jovanovich College Publishers.
- Eagly, A. H., & Chaiken, S. (1998). Attitude structure and function. In D.T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 269-322). New York, NY: The McGraw-Hill.

- Engel, J. F., Blackwell, R. D., & Kollat, D. T. (1978). *Consumer behavior* (3<sup>rd</sup> ed.). Hinsdale, IL: The Dryden Press.
- Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2003). Empirical testing of a model of online store atmospherics and shopper responses. *Psychology & Marketing*, 20(2), 139-150.
- Goldsmith, R. E., Freiden, J. B., & Kilsheimer, J. C. (1993). Social values and female fashion leadership: A cross-cultural study. *Psychology & Marketing*, 10(5), 399-412.
- Greifeneder, R., Scheibehenne, B., & Kleber, N. (2010). Less may be more when choosing is difficult: Choice complexity and too much choice. *Acta Psychologica*, 133(1), 45-50.
- Grudin, J. (1989). The case against user interface consistency. *Communications of the ACM*, 32(10), 1164-1173.
- Ha, Y., & Lennon, S. J. (2010). Online visual merchandising (VMD) cues and consumer pleasure and arousal: Purchasing versus browsing situation. *Psychology & Marketing*, 27(2), 141-165.
- Haynes, G. A. (2009). Testing the boundaries of the choice overload phenomenon: The effect of number of options and time pressure on decision difficulty and satisfaction. *Psychology & Marketing*, 26(3), 204-212.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Im, H., Lennon, S. J., & Stoel, L. (2010). The perceptual fluency effect on pleasurable online shopping experience. *Journal of Research in Interactive Marketing*, 4(4), 280-295.
- Iyengar, S. S., Huberman, G., & Jiang, W. (2004). How much choice is too much? Contributions to 401 (k) retirement plans. In O.S. Mitchell & S. Utkus (Eds), *Pension design and structure: New lessons from behavioral finance* (pp. 83-95). Oxford, England: Oxford University Press.
- Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology*, 79(6), 995-1006.

- Jessup, R. K., Veinott, E. S., Todd, P. M., & Busemeyer, J. R. (2009). Leaving the store empty-handed: Testing explanations for the too-much-choice effect using decision field theory. *Psychology & Marketing*, 26(3), 299-320.
- Kahn, B. E., & Wansink, B. (2004). The influence of assortment structure on perceived variety and consumption quantities. *Journal of Consumer Research*, 30(4), 519-533.
- Kim, M., Kim, J. H., & Lennon, S. J. (2006). Online service attributes available on apparel retail web sites: An ES-QUAL approach. *Managing Service Quality*, 16(1), 51-77.
- Kim, J., Kim, M., and Lennon, S. (2009). Effects of website atmosphere on consumer response: Music and product presentation. *Direct Marketing: An International Journal*, 25(9), 4-19.
- Langer, E. J., & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology*, 34(2), 191-198.
- Levy, M., & Weitz, B. A. (2012). *Retailing Management* (8<sup>th</sup> ed.). Boston, MA: McGraw-Hill/Irwin.
- McAlister, L., & Pessemier, E. (1982). Variety seeking behavior: An interdisciplinary review. *Journal of Consumer Research*, 9 (December), 311-322.
- Mendel, J. (2010). The effect of interface consistency and cognitive load on user performance in an information search task (Master's thesis, Clemson University). Retrieved from [http://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=2052&context=all\\_theses](http://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=2052&context=all_theses) (Paper 1052).
- Nielsen, J. (1989). Coordinating user interfaces for consistency. *ACM Sigchi Bulletin*, 20(3), 63-65.
- Ozok, A. A., & Salvendy, G. (2000). Measuring consistency of web page design and its effects on performance and satisfaction. *Ergonomics*, 43(4), 443-460.
- Oulasvirta, A., Hukkinen, J. P., & Schwartz, B. (2009, July). When more is less: the paradox of choice in search engine use. In *Proceedings of the 32nd international ACM SIGIR conference on Research and Development in Information Retrieval*, 516-523.

- Ratner, R. K., & Kahn, B. E. (2002). The impact of private versus public consumption on variety seeking behavior. *Journal of Consumer Research*, 29(2), 246-257.
- Reibstein, D. J., Youngblood, S. A., & Fromkin, H. L. (1975). Number of choices and perceived decision freedom as a determinant of satisfaction and consumer behavior. *Journal of Applied Psychology*, 60(4), 434-437.
- Reutskaja, E., & Hogarth, R. M. (2009). Satisfaction in choice as a function of the number of alternatives: When “goods satiate”. *Psychology & Marketing*, 26(3), 197-203.
- Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2009). What moderates the too-much-choice effect? *Psychology & Marketing*, 26(3), 229-253.
- Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research*, 37(3), 409-425.
- Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: happiness is a matter of choice. *Journal of Personality and Social Psychology*, 83(5), 1178-1197.
- Schwartz, B. (2004). *The paradox of choice: Why more is less*. New York, NY: Harper Collins.
- Shah, A. M., & Wolford, G. (2007). Buying behavior as a function of parametric variation of number of choices. *Psychological Science*, 18(5), 369-370.
- Simonson, I., & Tversky, A. (1992). Choice in context: Tradeoff contrast and extremeness aversion. *Journal of Marketing Research*, 29(3), 281-295.
- Solomon, M. R. (2013). *Consumer behavior* (10th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Tung, T., & Burns, L. D. (2014, July). *A theoretical model of the too-much-choice effect*. Paper presented at the 2014 Global Marketing Conference, Singapore.
- van Trijp, H. C., Hoyer, W. D., & Inman, J. J. (1996). Why switch? Product category: level explanations for true variety-seeking behavior. *Journal of Marketing Research*, 33(August), 281-292.


- Turban, E., King, D., Lee, J. Liang, T., & Turban, D. (2011). *Electronic Commerce 2012: Managerial and Social Networks Perspectives*. London, British: Pearson Higher Ed.
- Tversky, A., & Shafir, E. (1992). Choice under conflict: The dynamics of deferred decision. *Psychological Science*, 3(6), 358-361.
- U.S. Department of Commerce. (2016). Latest Quarterly E-Commerce Report  
<http://catalog.data.gov/dataset/quarterly-e-commerce-report/resource/3e1b5fa2-c60e-4531-ba41-accf5099400a>
- White, C. M., & Hoffrage, U. (2009). Testing the tyranny of too much choice against the allure of more choice. *Psychology & Marketing*, 26(3), 280-298.
- Yoo, J., & Kim, M. (2012). Online product presentation: The effect of product coordination and a model's face. *Journal of Research in Interactive Marketing*, 6(1), 59- 72.

## **APPENDICES**

## Appendix A

### IRB Approvals for Stage 1, Stage 2, and Stage 3

- Stage 1



**Institutional Review Board**  
Office of Research Integrity | Oregon State University  
8308 Kerr Administration Building, Corvallis, OR 97331-2140  
Telephone (541) 737-8008  
irb@oregonstate.edu | <http://research.oregonstate.edu/irb>

EXEMPT  
DETERMINATION

Date of Notification	12/03/2015		
Study ID	6743		
Study Title	The Exploratory Study of Consumer Online Shopping and Website Navigation Experience		
Principal Investigator	Elaine Pedersen		
Study Team Members	Leslie Burns, Tsun-Yin (Tracie) Tung		
Submission Type	Project Revision	Date Acknowledged	12/02/2015
Level	Exempt	Category(ies)	2
Funding Source	None	Proposal #	N/A
PI on Grant or Contract	N/A	Cayuse #	N/A

The above referenced study was reviewed by the OSU Institutional Review Board (IRB) and determined to be exempt from full board review.

**EXPIRATION DATE:** 03/05/2020

*The exemption is valid for 5 years from the date of approval.*

Annual renewals are not required. If the research extends beyond the expiration date, the Investigator must request a new exemption. Investigators should submit a final report to the IRB if the project is completed prior to the 5 year term.

Documents included in this review:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> Protocol | <input type="checkbox"/> Recruiting tools        | <input type="checkbox"/> External IRB approvals        |
| <input type="checkbox"/> Consent forms       | <input type="checkbox"/> Test instruments        | <input type="checkbox"/> Translated documents          |
| <input type="checkbox"/> Assent forms        | <input type="checkbox"/> Attachment A: Radiation | <input type="checkbox"/> Attachment B: Human materials |
| <input type="checkbox"/> Alternative consent | <input type="checkbox"/> Alternative assent      | <input type="checkbox"/> Other:                        |
| <input type="checkbox"/> Letters of support  | <input type="checkbox"/> Grant/contract          |  |

**Comments:** Changed the PI from Leslie Burns to Elaine Pedersen.

**Principal Investigator responsibilities:**

- Certain amendments to this study must be submitted to the IRB for review prior to initiating the change. These amendments may include, but are not limited to, changes in funding, , study population, study instruments, consent documents, recruitment material, sites of research, etc. For more information about the types of changes that require submission of a project revision to the IRB, please see:  
[http://oregonstate.edu/research/irb/sites/default/files/website\\_guidancedocuments.pdf](http://oregonstate.edu/research/irb/sites/default/files/website_guidancedocuments.pdf)
- All study team members should be kept informed of the status of the research. The Principal Investigator is responsible for ensuring that all study team members have completed the online ethics training requirement, even if they do not need to be added to the study team via project revision.
- Reports of unanticipated problems involving risks to participants or others must be submitted to the IRB within three calendar days.

- The Principal Investigator is required to securely store all study related documents on the OSU campus for a minimum of three years post study termination.

- Study 2 and 3

**EXEMPT  
DETERMINATION**

Date of Notification	01/07/2016		
Study ID	6888		
Study Title	The too-much-choice effect in online shopping		
Principal Investigator	Elaine Pedersen		
Study Team Members	Leslie Burns, Tracie (Tsun-Yin) Tung		
Submission Type	Project Revision	Date Acknowledged	01/07/2016
Level	Exempt	Category(ies)	2
Funding Source	None	Proposal #	N/A
PI on Grant or Contract	N/A	Cayuse #	N/A

The above referenced study was reviewed by the OSU Institutional Review Board (IRB) and determined to be exempt from full board review.

**EXPIRATION DATE:** 05/31/2020

*The exemption is valid for 5 years from the date of approval.*

Annual renewals are not required. If the research extends beyond the expiration date, the Investigator must request a new exemption. Investigators should submit a final report to the IRB if the project is completed prior to the 5 year term.

Documents included in this review:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> Protocol | <input type="checkbox"/> Recruiting tools        | <input type="checkbox"/> External IRB approvals        |
| <input type="checkbox"/> Consent forms       | <input type="checkbox"/> Test instruments        | <input type="checkbox"/> Translated documents          |
| <input type="checkbox"/> Assent forms        | <input type="checkbox"/> Attachment A: Radiation | <input type="checkbox"/> Attachment B: Human materials |
| <input type="checkbox"/> Alternative consent | <input type="checkbox"/> Alternative assent      | <input type="checkbox"/> Other:                        |
| <input type="checkbox"/> Letters of support  | <input type="checkbox"/> Grant/contract          |  |

**Comments:** Changed PI to Elaine Pedersen; revised questions, revised recruitment.

**Principal Investigator responsibilities:**

- Certain amendments to this study must be submitted to the IRB for review prior to initiating the change. These amendments may include, but are not limited to, changes in funding, , study population, study instruments, consent documents, recruitment material, sites of research, etc. For more information about the types of changes that require submission of a project revision to the IRB, please see:  
[http://oregonstate.edu/research/irb/sites/default/files/website\\_guidancedocuments.pdf](http://oregonstate.edu/research/irb/sites/default/files/website_guidancedocuments.pdf)
- All study team members should be kept informed of the status of the research. The Principal Investigator is responsible for ensuring that all study team members have completed the online ethics training requirement, even if they do not need to be added to the study team via project revision.
- Reports of unanticipated problems involving risks to participants or others must be submitted to the IRB within three calendar days.
- The Principal Investigator is required to securely store all study related documents on the OSU campus for a minimum of three years post study termination.

## Appendix B

### Stage 1 Recruitment Email

***Subject: Participate in focus group about online shopping experience.***

Hi,

You are invited to participate in a research study focusing on understanding consumer experience in online shopping. If you are (1) over 18 years old, (2) have made at least 2 online purchases of apparel products in the past six months, and (3) able to be interviewed on the Oregon State University campus, we would like to invite you to participate in a focus group interview. The focus group will last about 1.5 hours; to help the researchers better understand the research questions, with your permission, the discussion will be video recorded.

You will share your online shopping experience in a setting of group discussion. Your responses will be kept confidential and your participation in this study is completely voluntary. You have the option to withdraw from the discussion at any time.

Free food and beverages will be provided during the focus group. You will also be given the option to be placed in a drawing for \$100 cash after the discussion. The winner will be selected shortly after the focus group ends on [Month/Date].

To participate, please sign up at [http: WEBSITE LINKS](http://WEBSITE LINKS).

An additional email will be sent to you within one week from the day you sign up to notify your assigned session.

If you have any questions, please contact Tracie Tung at [tungt@oregonstate.edu](mailto:tungt@oregonstate.edu) or the Primary Investigator, Dr. Leslie Burns at [leslie.burns@oregonstate.edu](mailto:leslie.burns@oregonstate.edu) or 541-737-0983.

Thank you for your time,

--Tracie Tung

Doctoral Candidate  
School of Design and Human Environment  
College of Business  
Oregon State University

Title: The Exploratory Study of Consumer Online Shopping and Website Navigation Experience.

## Appendix C

### Stage 1 Focus Group Topic Guide

#### Introduction

2 min

**Moderator introduction:** *"WE ARE INDEPENDENT RESEARCHERS, You are the experts.*

*As a moderator, I want to encourage you to*

- *Speak openly, take turns speaking, agree or disagree with others but encourage everyone to share their opinions.*
- *Sometimes what you don't know is just as important as what you do know, so please speak up and let us know if we are talking about something you are unfamiliar with.*
- *The discussion is being taped, primarily for note taking purpose, and we do have research staff sitting in the other room watching our discussion.*
- *Do you have any questions about the informed consent document or about our discussion group?*
- *As you read in the informed consent document, to help protect your confidentiality, we are on a first name basis in here tonight. Out of respect to the other participants, please do not share comments or the identity of the other participants once you leave the discussion group room.*

**Introduction to the research project:** *Tonight we would like to talk about website navigation and your online clothing shopping experience. The student researcher is trying to understand consumers' online shopping experience and to organize your feedback to help to improve website design.*

#### Introduction to each other: Icebreaker

10 min

Moderator Instructs: On the sheet provided, write down the answers for the following questions

1. How frequently do you shop online?
2. What kinds of products do you usually purchase online?
3. Is there any thing you will definitely not buy online?

Moderator: Have participants paired up. Instruct them to introduce themselves to their partner. Have each participant introduce his/her partner to the group.

Conversation segues into Topic 1.

#### Topic 1: General Online Shopping Experience

10 min

Moderator: Well, you all have lots of online shopping experience, so let's talk specifically about online clothing shopping.

1. What types of websites do you visit for apparel shopping?

2. What do you like about those websites?
3. Do you consider every one of your online shopping experience enjoyable?
4. How often do you abandon the shopping cart, such as leave the website without completing the purchasing process? Why?

**Topic 2: Projective Activity - Comic**

**25 min**

Moderator: *Now I would like to show you a comic (Comic 1). Here you go. Use the pencil and paper in front of you and take 5 minutes to fill in the dialog bubble for it. If she/he is shopping for clothes online. What is she/he think? And give a story about her/him, such as adding some context/background and why is she/he shopping, to the comic as well.*

----- After all the participants finish writing -----

Moderator: Well, now let's take a look the second comic (Comic 2). So, on a different page, write down what she/he is thinking again and provide a story about this comic.

----- After all the participants finish writing -----

Moderator: Now, let's talk about the stories you just wrote. How about we start with the first comic? Who would like to share her/his story?

Moderator: Next, how about the second comic? Why don't we go around the table?

Possible probing:

1. Why do you think he/she looks confused/upset?
2. What obstacle is she/he encountering?

**Topic 3: Projective Activity – Comic + Website**

**25 min**

Moderator: If now on the TV screen here I am showing you the website he/she is looking at (Comic 2), so what is wrong with the website or the shopping process? Anyone would like to demonstrate or walk us through your online shopping experience here with this website?

Possible probing:

1. Do you feel overwhelmed with so many products?
2. How many products does he/she prefer to see on one page?
3. How is the navigation design?
4. How are the filtering features?
5. What frustrated you most during navigation?

**Topic 4: Ideal Online Clothes Shopping Experience****15 min**

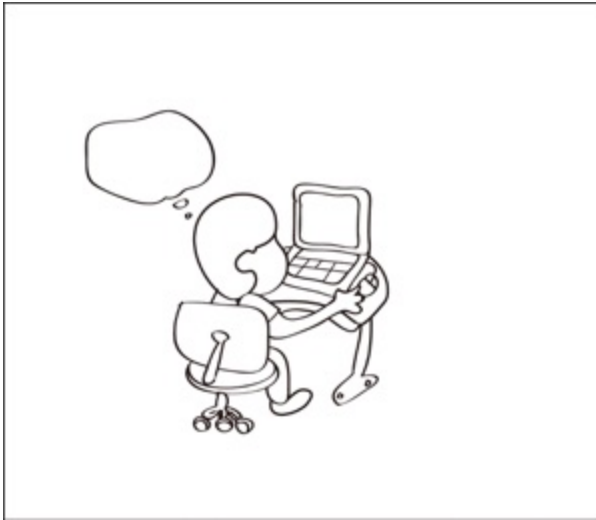
Moderator: In addition to describe [NAME]'s online shopping experience, we would like to know more about yours.

1. Describe your ideal online shopping experience.
  - a. What is it like for an enjoyable shopping experience?
  - b. What would the website design be like?
  - c. How would the product be displayed?
  - d. How would the check-out process go?
  - e. How would the website service be like?

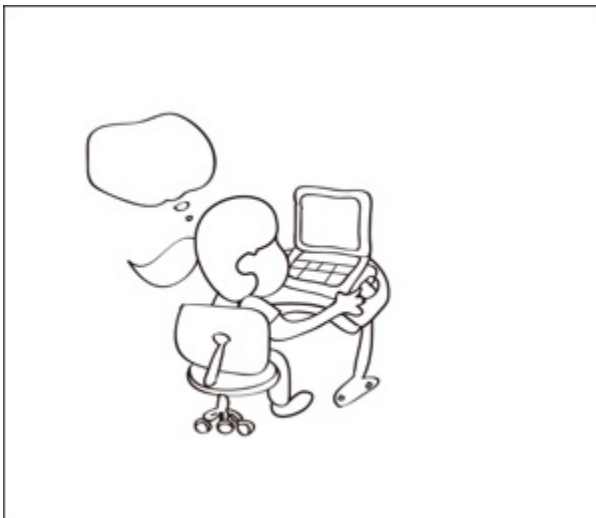
**Moderator: Wrap-up****2 min**

Moderator: Do you have any other questions or comments?

We would like to thank you for your time and participation. When you exit, please put your name and contact information in the lottery box. You may earn \$100 cash for your kindly participation. We will notify you by email or phone (as per your preference) a week from today. Thank you.

**Comic 1:**

For male groups



For female groups

**Comic 2:**

For male groups

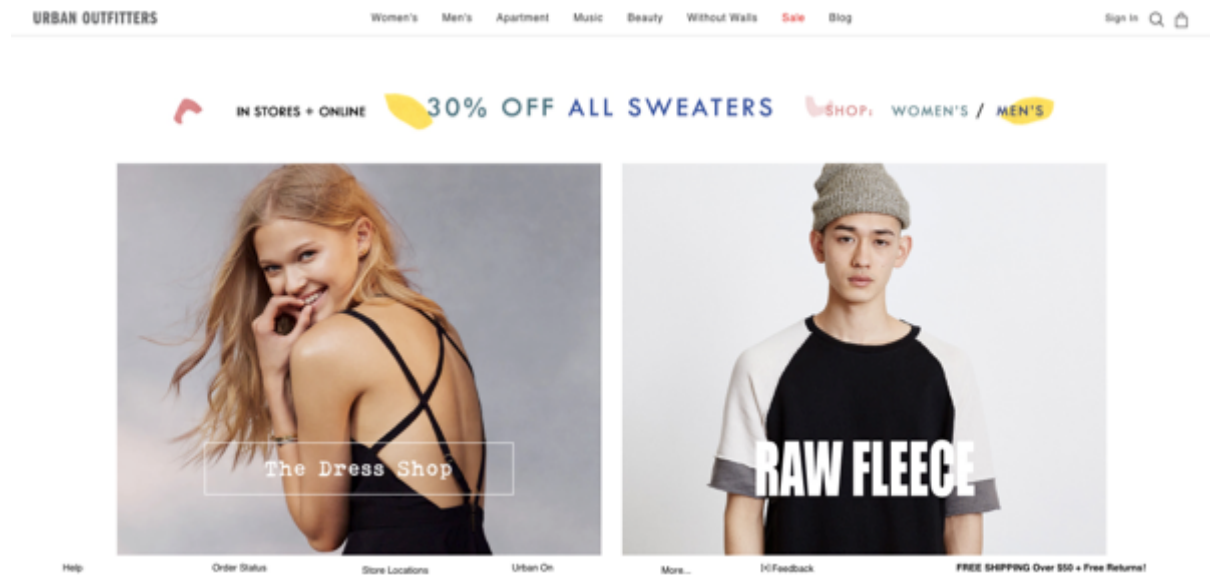


For female groups

Website for male & female focus groups:

<http://www.urbanoutfitters.com>

[Screen Shot on Feb. 27, 2015]



## Appendix D

### Stage 2 Pretest Questionnaire

1. Are you 18 years old or older?
  - a. Yes
  - b. No  
→ (if No is selected, link to the end of the survey “Thank you for your participation.”)
2. What is your gender?
  - a. Male
  - b. Female
3. The following section consists of several styles of women’s/men’s tops. Please rate each style based on your own opinion.

Examples (women):



(132 images/styles)

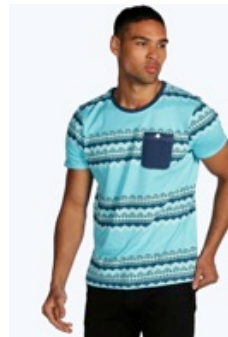


(132 images/styles)

Examples (men):



(132 images/styles)



(132 images/styles)

- |   |                     |                    |
|---|---------------------|--------------------|
| 4. This style is what my peers would wear. <sup>1</sup> | 1 Strongly disagree | 100 Strongly agree |
| 5. I can see myself wearing this style.                 | 1 Strongly disagree | 100 Strongly agree |

---

<sup>1</sup> Participants will answer question 4 and 5 for each style.

6. Age: \_\_\_\_\_

7. In which college is your major located?

- |  |  |
|--|--|
| <input type="checkbox"/> Agricultural Sciences                             | <input type="checkbox"/> Liberal Arts                  |
| <input type="checkbox"/> School of Design and Human Environment (Business) | <input type="checkbox"/> Pharmacy                      |
| <input type="checkbox"/> Business  | <input type="checkbox"/> Public Health & Human Science |
| <input type="checkbox"/> Earth, Ocean, & Atmospheric Sciences              | <input type="checkbox"/> Science                       |
| <input type="checkbox"/> Education   | <input type="checkbox"/> Veterinary Medicine           |
| <input type="checkbox"/> Engineering                                       | <input type="checkbox"/> Other: _____                  |
| <input type="checkbox"/> Forestry  |  |

8. What is your class standing?

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Graduate student (master or Ph.D)

9. Ethnicity/Race:

- ☐ Asian
- ☐ Black/African American
- ☐ Caucasian (White)
- ☐ Hispanic/Latino
- ☐ Multicultural
- ☐ Native American/Alaskan American
- ☐ Native Hawaiian/Pacific Islander
- ☐ Other: \_\_\_\_\_

## Appendix E

### Stage 3 Questionnaire

#### Screening Question

1. Are you 18 years or older?
  - a. Yes
  - b. No → to the end of the survey.

#### Group assignment

2. Gender:
  - a. Female
  - b. Male

Control Variable – Fashion Opinion Leadership (Product familiarity) (Goldsmith, Freiden, & Kilsheimer, 1993) (1 Strongly disagree – 7 Strongly agree)

#### **Please answer the following questions regarding your attitude toward fashion.**

3. I am aware of fashion trends and want to be one of the first to try them.
4. I am the first to try new fashions; therefore, many people regard me as being a fashion leader.
5. It is important for me to be a fashion leader.
6. I am confident in my ability to recognize fashion trends.
7. Clothes are one of the most important ways I have of expressing my individuality.
8. I spend a lot of time on fashion-related activities.

**We would like to know your ONLINE shopping experiecn. Please answer the following questions.**

**Presentation Peference** (1 Strongly disagree – 7 Strongly agree)

9. I do not need to see the products on human models to make a purchase decision.
10. I prefer to see all products displayed on human models.
11. I prefer to see all products displayed on mannequins.
12. I prefer to see all products displayed by themselves (not on human models or mannequins).
13. I prefer all products to be displayed in a consistent way (all human models, mannequins, or by themself).
14. I like that I could view all products on one page.
15. I do not have a preference as to whether apparel products are displayed on human modes, mannequins, or by themselves on a website.

**Model Self-refection** (1 Strongly disagree – 7 Strongly agree)

16. Typically, products look best when they are on human models.
17. Typically, human models on apparel websites are attractive.
18. It is easier for me to predict how a product will look on me when I see it on a human model than other types of displays.
19. Just because a product looks good on the model does not mean that it will look good on me.

**General Model Experience** (1 Strongly disagree – 7 Strongly agree)

20. Presenting a product on a human model helps me make my purchase decision.
21. I feel more confident selecting a product to purchase when the product is displayed on a human model.

**Please read the following statement and answer the following question.**

“Researchers have asserted that an individual would enhance her self-concept through products consumed. Clothes are a good example, because clothing has been recognized as a product with strong symbolic meaning in expressing an individual’s identity.”

22. How much do you agree with this statement? (1 Strongly disagree – 7 Strongly agree)

**Scenario**

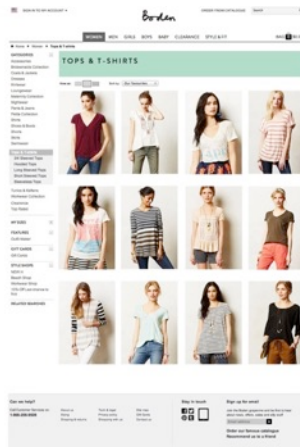
The next part is a marketing survey for a new apparel retailer.

To assist the retailer with developing their product assortment, we are interested in learning about which of the products you would purchase.

On the next page, you will be asked to browse the retailer's website and choose ONE top (blouse/shirt/T-shirt) for yourself and answer some related questions regarding your online shopping experience.

Click "next" to browse the products. You will be asked to select the top (blouse/shirt/T-shirt) of your choice.

### Stimuli



23. Please pick your choice.

### Manipulation Check

**Please answer the following questions regarding the website and products.**

- 24. The website was realistic compared to other shopping websites I usually visit. (1 Strongly disagree – 7 Strongly agree)
- 25. The number of potential products is...1 Too few, 4 About right, and 7 Too many
- 26. This assortment of tops offers a lot of variety. (1 Strongly disagree – 7 Strongly agree)
- 27. I have previously shopped on the Boden website.

### Image Clarity (1 Strongly disagree – 7 Strongly agree)

- 28. It was difficult to evaluate the tops when I was trying to make a decision.
- 29. The images of the products give me enough information in order to select the top.
- 30. The images were big enough for me to examine the tops.
- 31. I wish there were more views of each garment when trying to make a decision.
- 32. The images of the products gave me enough information about the silhouettes of the tops in order to make my selection.

*Frustration (1 Strongly disagree – 7 Strongly agree)*

- 33. I was frustrated by the website design.
- 34. I was frustrated by how the website organized the images of the tops.
- 35. I liked the website design.
- 36. I think the retailer should change the website design.
- 37. I was frustrated because I could not find the top I like.
- 38. I was frustrated because the assortment of products did not provide a good selection.

*Overwhelmed (1 Strongly disagree – 7 Strongly agree)*

- 39. I have difficulty remembering the different options that were available on the webpage I viewed.
- 40. I felt overwhelmed because many of the products seem very similar to one another.
- 41. It was difficult to make my decision because I found more than one top I like.
- 42. I needed to make some trade-offs in deciding which top I should select.
- 43. I felt overwhelmed with the number of products on the website.

*Anticipated regret (Iyengar & Lepper, 2000) (1 Strongly disagree – 7 Strongly agree)*

- 44. If I were to actually purchase the top I selected, it is likely that I would regret my decision.
- 45. This top is the item that if I did not buy it now, I would keep thinking about it.
- 46. I am not sure if I would really like the top I just selected.
- 47. If this top was actually available for purchase, I would buy it for myself.

**Please answer the following questions regarding your decision-making process.***Enjoyment (Iyengar & Lepper, 2000) (1 Strongly disagree – 7 Strongly agree)*

- 48. I liked this product assortment because there were a wide variety of tops.
- 49. I enjoyed the process involved in choosing a top.
- 50. I felt bored going through the products on the website.
- 51. I thought it was fun to browse through the tops on the website.

*Behavioral Intention (1 Strongly disagree – 7 Strongly agree)*

- 52. I wish I could have used filters to find the style I like.
- 53. I wish I could have changed the number of products that are displayed on one page.
- 54. I wish there was a "quick view" window.
- 55. I wish I could have seen customer reviews for each top.
- 56. During this process, I wanted to give up on searching for a top to select.
- 57. I felt lost because there are too many options on the website.
- 58. I would be willing to register with this retailer in order to proceed to check out and purchase the top.

59. If I were actually shopping for a top, I would not purchase a top from this site.
60. If you were to purchase the top you just selected, how much would you pay? \$ \_\_\_\_\_ (Do not include shipping expense.)
61. What price do you think the retailer would charge for this shirt?



### Behavioral Consequences

Thank you for participating in this survey.

62. As we mentioned in the beginning, you have a chance to enter a raffle to win \$150 cash. If you would like to participate in the raffle, please leave your email here:

\_\_\_\_\_.

63. \*\*\*Please check the box(es) if you would like to receive emails from the retailer or the researcher:

- ☒ I would like to receive emails from the retailer regarding their products in the future.  
☐ I would like to receive an email regarding the details of this survey in two weeks.

64. Before you enter the last section of the survey, if you would like to change your choice of top, please click here.

\*\*\*Please notice that you may be given a different set of products.

- ☐ Yes, I would like to review the tops again.  
☐ No, I do not want to change my selection.

### Online shopping experience

65. **How often do you purchase apparel products online?**

- More than once a month.
- Once a month.
- Once every 2 months.
- Once every 3 months.
- Once every 4-6 months.
- Once every 7-12 months.
- I have purchased, but not within last year.
- I have never purchased apparel products online.

66. Within the past 12 month, how many **tops/ t-shirts/ blouses** have you purchased online? \_\_\_\_\_
67. Within the past 12 month, how many **sweaters** have you purchased online?  
\_\_\_\_\_
68. Within the past 12 month, how many **dresses** have you purchased online?  
\_\_\_\_\_
69. Within the past 12 month, how many **jackets/ blazers/ coats** have you purchased online? \_\_\_\_\_
70. Within the past 12 month, how many **jeans** have you purchased online?  
\_\_\_\_\_
71. Within the past 12 month, how many **other pants** have you purchased online?  
\_\_\_\_\_
72. Within the past 12 month, how many **skirts** have you purchased online?  
\_\_\_\_\_
73. Within the past 12 month, how many **intimate apparel** have you purchased online?  
\_\_\_\_\_

**Please answer the following questions regarding your demographics information.**

Demographics

74. Ethnicity:
- a. Hispanic/Latino
  - b. Not Hispanic/Latino
75. Race (Check all that apply):
- a. Asian
  - b. Black/African American
  - c. Caucasian (White)
  - d. Hispanic/Latino
  - e. Indian American/Alaskan American
  - f. Native Hawaiian/Other Pacific Islander
  - g. Other: \_\_\_\_\_
76. Age (Years): \_\_\_\_\_
77. What year are you in your studies:
- a. Freshmen
  - b. Sophomore
  - c. Junior
  - d. Senior
  - e. Graduate Student
  - f. I am not a student

### **Study Debriefing**

**Thank you very much for your participation in this research study!**

- **What is this study for?**

This is a study conducted by a doctoral student for research purposes. Your responses and personal information will be kept confidential. *You will NOT receive any emails from the retailer.*

- **When will I know the raffle result?**

The winner will be drawn and announced via email within two weeks after all data has been collected. The winner of the raffle will receive a reward of \$150 USD cash from this study.

- **What if I want to know more?**

We will notify you through emails in two weeks regarding the detailed information of this research study. Furthermore, if you have questions about this study or want to remove your data, please contact Tracie Tung through email at [tungt@oregonstate.edu](mailto:tungt@oregonstate.edu)