An Investigation of the Relationships among Consumer Characteristics, Attitude, and Purchase Intention in Apparel Mass-customization

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ABSTRACT

Mass-customization is a form of consumer-centric business practice, which is a hybrid of customization and mass-production (Gilmore & Pine II, 1997). It is the use of flexible processes and organizational structures to produce individually customized apparel products at the low cost of a standardized mass-production system (Hart, 1995). Very limited academic consumer research has been conducted in the area of apparel mass-customization. The purposes of the study were (a) to investigate consumers' purchase intentions of mass-customized apparel, (b) to examine the relationships among consumer characteristics, perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization, and purchase intention of mass-customized apparel, and (c) to identify the predictors of the overall purchase intentions and those of the purchase intentions of specific types of mass-customized apparel (i.e., design, fit and personalization mass-customized apparel). A conceptual model was developed, and eight hypotheses were generated to test the proposed relationships among the variables. A questionnaire was developed as the instrument of collecting data. A national sample of 474 male adults was recruited by a market research company. Statistics such as descriptive statistics, factor analysis, and stepwise multiple regression analysis were used to analyze the collected data. The results indicated that more than half of the respondents were willing to purchase mass-customized dress shirts. The relationships among consumer characteristics, perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization, and purchase intention of mass-customized apparel were confirmed, and the predictors of the overall purchase intention and of the purchase intention of specific types of mass-customized apparel were identified. Based on the results, in-depth discussions and related marketing implications were provided.

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CHAPTER I
INTRODUCTION

The first chapter of this dissertation includes five sections. The first section provides the background of apparel mass-customization; the second section summarizes the gaps of literature review; the third section includes a list of the purpose and objectives of the study; the fourth section lists out the conceptual definition of each major variable in the study; and the last part of this chapter explains the assumptions and limitations of the study.

Background of Apparel Mass-customization

In this section, background information related to apparel mass-customization is provided. The first section, environment of apparel market, addresses the current market situation related to mass-customization of apparel. The second section, benefits of adopting mass-customization, discusses possible benefits of adopting mass-customization as a way to better fulfill apparel consumers' wants and needs. The third section, roles of advanced technologies in apparel mass-customization, discusses how various technologies may enable the implementation of apparel mass-customization and may facilitate consumers' adoption and use of apparel mass-customization.

Environment of the Apparel Market

In the current apparel market, consumers' demand has become increasingly more volatile and unpredictable (Sen, 2008). Some consumers purchase high-priced, prestige apparel items, some prefer low-priced, bargain items, but others mix and match buying apparel items across various pricing zones. Some consumers are willing to spend a large amount of money on better

designed premium apparel while others prefer basic staples. Similarly, some consumers may be willing to pay for better fitted custom-tailored apparel while others may be satisfied with less expensive ready-to-wear clothes in standardized size. Due to differing consumers' behaviors, it is important for apparel companies to develop various strategies to fulfill the diverse and unpredictable demands of consumers.

Recognizing consumers' increasing demands, many businesses have switched their focus from a business-centric orientation to a consumer-centric centric orientation (Engel, Blackwell, & Miniard, 1995; Peppers & Rogers, 1993). Consumer-centric marketing is defined as "the discipline of capturing and deploying consumer insights to enhance marketing effectiveness and better serve those consumers that are brand's best prospects" (Maney, Flink, & Lietz, 2002, p.3). The focus of a consumer-centric centric business is to increase consumer satisfaction by catering to consumers' needs and wants. Companies that conduct business in a consumer-centric business orientation try to provide products or services that consumers seek through extensive communication with consumers to obtain information about what can satisfy the consumers (Vargo & Lusch, 2004).

In order to better cater to consumers who want specific products, many companies have adopted niche marketing. A niche is "a more narrowly defined group seeking a distinctive mix of benefits" (Kotler, 2003, p. 280). Niche marketing deals with limited segments of consumers rather than a mass market, and is used as a means to cater to limited number of consumers who have similar but specific desires. In the textiles and apparel industry, the characteristics of niche marketing included a strong and loyal customer base, a specialized segment of the market, a higher price point, and unique products (Parrish, Cassill, & Oxenham, 2006). However, the fragmentation of consumers has reached a point where even niche markets are too broad to successfully target consumers because consumers' demands are becoming more diverse and unpredictable even within a niche market (Bardakci & Whitelock, 2004). Many apparel businesses need to deal with individual markets and cater to individuals' needs (Gilmore & Pine II, 1997; Peppers & Rogers, 1993).

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Benefits of Adopting Mass-customization

Adopting mass-customization can be effective in a consumer-centric apparel business environment where there are diverse and unpredictable consumer demands and excessive competition within the industry (Bardakci & Whitelock, 2004). Mass-customization is a business paradigm in which the firms manufacture individually customized products within a mass-production system (Pine II, 1993). The technique creates variety and customization through flexibility and quick responsiveness. Mass-customization creates a product that is made-to-order, which is different from 'made-to-stock' inventory in mass-production processes (Boer & Dulio, 2007). Consequently, it is a feasible way to fulfill individual wants and needs (Pine II, 1993; McKenna, 2000).

Aside from the increased ability to fulfill consumer demands, adoption of mass-customization may help firms gain profits. Implementing mass-customization may lower costs by reducing inventory and stocking storage. Instead of mass-producing products and storing the products in a warehouse until they are sold, the manufacturer produces products in a 'made-to-order' manner and only keeps minimum supply, and thus, reduces the cost of stock storage. Adopting mass-customization may also help firms gain profits by minimizing product returns. Because a mass-customized product is made specifically for the customer who placed the order, the return rate may be lowered due to a higher degree of customer satisfaction. In addition, adopting mass-customization may increase customer loyalty because obtaining accurate information about the change in customer values and tastes is one of important practices in mass-customization (Endo & Kincade, 2008; Kratochvil & Carson, 2005; Wing & Rangaswamy, 2000). Providing products that are more valuable to the customers is essential in building customer loyalty (Parasuraman & Grewal, 2000)

Many industries now use mass-customization as a new method of approaching market niches (i.e., providing product features aimed at satisfying specific market needs). For example, in the computer industry, Dell and Hewlett-Packard sell customizable computers through their website. Customers can buy a computer with customized components by selecting the options they want. Similarly, in the automobile industry, Toyota sells customized cars through its 'build your Toyota' section on www.toyota.com where a customer can choose trim, exterior color, interior color, and accessories (e.g. satellite radio) for his or her car. In the apparel industry, Levi

Strauss & Co. began mass-customization by offering individually tailored jeans, called Personal Pair, for a $10 premium (Pine II, 1996). Currently, some well-known apparel companies such as Brooks Brothers, J.Crew, Land's End, L.L. Bean, Nike, and Timberland sell mass-customized products (e.g. clothing, shoes, accessories) as a part of their business model. Customers are able to buy clothing and shoes that have the style and color of their choice and a size to fit their own body. For example, Brooks Brothers and Lands' End offer customers mass-customized dress shirts by allowing them to select type of fabric, color, style, and details to their preference and allowing them to provide their own body measurements. Nike offers a mass-customized athletic shoe line called Nike ID. Consumers can go to www.nikeid.com and choose a design of their athletic shoes among available options and colors from the provided color palette. If the customers like, they can even add a monogram of their initials on the shoes. In addition to well-known apparel retailers, Internet stores also sell mass-customized apparel. For example, www.makeyourownjeans.com provides mass-customized jeans, shirts and suits for females and jeans and shirts for male customers, while www.fashionplaytes.com sells mass-customized t-shirts, hoodies and dresses to female children, ages six to 14.

Role of Technologies in Apparel Mass-customization

The technological advances in apparel industry make the adoption of mass-customization feasible. Development and improvement of technologies contributed to the production and distribution of mass-customized products (Bardakci & Whitelock, 2004). In apparel manufacturing sector, the development of advanced sewing machines improved the sewability in product manufacturing. Sewability is defined as "the determination of whether the product can be easily sewn in the selected production facilities" (Kincade & Gibson, 2010, p. 460). Improvement in sewability is important for apparel mass-customization because sewing is the most labor-intensive and time consuming process in apparel manufacturing. With improved sewability as a result of the development of advanced sewing machines, sewers can produce made-to-order garments efficiently to achieve the production scale large enough to bring profits to the company. In addition, reducing the time in producing a garment may prevent customers' dissatisfaction caused by the long wait time between the order and the receipt of the product.

The technological advance in computer systems is another important factor that makes apparel mass-customization feasible. For example, Computer-Aided Design (CAD) allows a firm to incorporate the features, colors, styles, and details that a customer prefers in the design of the garment and facilitate the communication with the customer by illustrating the design on a computer screen. Body-scanning technology can be used to measure a customer's body dimensions in order to produce a garment that fits the consumer based on the consumer's fit preference. Digital printing can be used to produce fabric of which the print is provided or selected by the customer. In addition, digital printing can be used in personalizing a garment by printing letters, prints, or a picture that was selected by the customer. These technological advances in the apparel industry play an important role in making the mass-customization feasible by allowing the apparel firms to provide customers with varied design and fit, and personalization.

The advances in website development allow apparel retailers to provide easy and convenient access for consumers to participate in mass-customization and to communicate with manufacturers or retailers. For example, consumers can easily select styles or colors of their choice by clicking the options provided on the manufacturer or retailer's website and live-chat online with a customer representative on the webpage to participate in apparel mass-customization. The technologies in website design increase the efficiency of the communication between the consumer and the firm, which is an essential process in apparel mass-customization.

Gaps in the Literature

Although Levi Strauss initiated the approach of mass-customization for apparel in the mid 90's (Rifkin, 1995), even till today, there is a lack of academic research in consumer behavior about mass-customized apparel. With regard to consumers' demographic characteristics, only one study by Lee, Kunz, Fiore, and Campbell (2002) was found, reporting that more female than male college students were willing to use body scanning and to involve in a co-design process. In terms of consumers' psychographic characteristics, only Fiore, Lee, and Kunz (2003, 2004) were found investigating the relationship between consumers' optimum stimulus level and willingness to use body scanning and to participate in a co-design process. In this study, optimum stimulus level referred to the level of desire for stimulus such as novelty, excitement or

new experience from environment. The results showed that consumers with a higher level of optimum stimulus were more willing to use body scanning and to participate in co-design.

Except these three studies (Lee, et al., 2002; Fiore, et al., 2003; 2004), no other study was found examining the characteristics of consumers of mass-customized apparel or the relationship between consumer characteristics and purchase intention for mass-customized apparel. Research-based information regarding consumers' demographic and psychographic characteristics in relation to consumers' purchase intention in the domain of apparel mass-customization is needed. Such information can be used by apparel marketers to develop effective marketing strategies such as segmentation, promotion, and pricing strategies to increase consumers' purchase intention for mass-customized apparel.

Previous studies have investigated consumers' general attitude toward mass-customization (e.g. Anderson-Connell, Ulrich, & Brannon, 2002; Fiore et al., 2004; Goldsmith & Freiden, 2004) and found that consumers were interested in apparel mass-customization, in general. Anderson-Connell et al. (2002) found that the participants of a focus group were interested in and felt the need of customized fit, and were interested in the co-design option. In Goldsmith and Freiden's (2004) study, 61% of the respondents who were interviewed at a regional airport in the South East of the United States had a positive attitude toward mass-customization of dressy clothes. Many other researchers also have investigated consumer willingness to participate in a co-design process (Choy & Loker, 2004; Endo & Kincade, 2008; Fiore et al., 2004; Kamali & Loker, 2002; Lee et al., 2002; Ulrich, Anderson-Connell, & Wu, 2003) and some specifically investigated willingness to use technologies in apparel mass-customization such as body scanning for fit-customization (Ashdown & Dunne, 2006; Fiore, et al. 2003). Consistently, these studies have shown that consumers were interested in participating in apparel mass-customization. Some consumers had concerns with the unfamiliarity of equipment used in apparel mass-customization such as CAD or 3D body scanning (Anderson-Connell et al., 2002) and waiting time between the points of order and reception of the product (Kincade & Gibson, 2005).

Although many studies have investigated consumers' general attitude toward mass-customization and found that consumers were willing to use the mass-customization option for fashion products, limited studies were found examining the factors influencing consumers' attitudes toward mass-customization. Cho and Fiorito (2009) examined the effects of perceived

security, perceived ease of use, and perceived usefulness on consumer attitude toward online apparel mass-customized jeans. The authors found a positive relationship between perceived usefulness and attitude toward the websites providing mass-customized apparel. Fiore et al. (2004) investigated the relationships between two types of benefits sought (i.e., gain exciting experience, be able to purchase unique products) and willingness to use co-design. The authors found that the two types of benefits sought were positively related to willingness to use co-design. More studies in understanding the factors that either positively or negatively influence consumer' attitude toward apparel mass-customization are needed for firms to develop effective strategies for apparel mass-customization. If positive factors are identified, firms can develop strategies to enhance consumers' attitude toward apparel mass-customization. For example, if studies show that consumers who perceive apparel mass-customization as being useful have a favorable attitude toward apparel mass-customization, then a firm may develop advertisements that emphasize the usefulness of using the mass-customization option in apparel shopping. Conversely, if negative factors are identified, firms can develop strategies to overcome the problems. For example, if studies report that lower confidence in participating in online apparel mass-customization will lead to a less favorable attitude toward using apparel mass-customization, the firm can improve the procedure to be more user-friendly or offer online live chat with a customer service representative to assist the customer in the apparel mass-customization process. Therefore, studies in examining the factors related to consumer attitude toward apparel mass-customization are needed to provide a basis for foundation for the development of efficient marketing strategies.

There is also a lack of research in predicting consumers' purchase intention for mass-customized apparel. To predict consumer purchase behavior of mass-customized apparel, it is more effective to measure consumers' purchase intention for mass-customized apparel than to measure consumer attitude toward apparel mass-customization (Ajzen, 1991). It is possible that consumers may not have an intention to purchase mass-customized apparel even if they have a favorable attitude toward apparel mass-customization. Therefore, an examination of the factors predicting consumers' purchase intention for mass-customized apparel is needed.

There are different types of apparel mass-customization such as design mass-customization, fit mass-customization, personalization mass-customization, based on Burns and Bryant's (2005) description of apparel mass-customization. However, no study was found

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examining the relationship between consumer characteristics and different types of apparel mass-customization. Consumers with different characteristics may prefer a different type of apparel mass-customization. For example, consumers who seek uniqueness in clothing may prefer design mass-customization or personalization mass-customization, while consumers who seek better fit may prefer fit mass-customization over design mass-customization or personalization mass-customization. Research-based studies are needed to provide information for firms to develop strategies to target different segments of consumers for different types of apparel mass-customization.

Lee, et al. (2002) found that jeans was a type of clothing that consumers were more likely to purchase through using a mass-customization option, and Cho and Fiorito (2009), based on Lee et al.'s result (2002), conducted a study examining the shopping behavior of mass-customized jeans. Different from the results of Lee et al., Goldsmith and Freiden's (2004) found that consumers considered using the mass-customization option for dressy clothing to be more appropriate than for casual clothing. However, few studies has investigated consumer attitude toward dressy clothing such as mass-customized dress shirts, which may yield different results.

Purposes and Objectives of the Study

The purposes of the study were (a) to investigate consumers' purchase intentions for mass-customized apparel, (b) to examine the relationships among consumer characteristics, perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization, and purchase intention for mass-customized apparel, and (c) to identify predictors of the overall purchase intentions and those of the purchase intentions for specific types of mass-customized apparel.

With regard to consumers' characteristics, in addition to demographics, two psychographic characteristics of consumers, benefits sought and innovativeness, were included in the study. In benefits sought, three constructs (i.e., uniqueness seeking, fit seeking, deal seeking) were included. In innovativeness, two constructs (i.e., fashion innovativeness, technology innovativeness) were included.

To investigate the factors that influence consumers' attitude toward using apparel mass-customization, a total of eight factors were included as the independent variables, which were the

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three types of benefits sought (i.e., uniqueness seeking, fit seeking, deal seeking), two types of innovativeness (i.e., fashion innovativeness, technology innovativeness), perceived usefulness, and two types of perceived behavioral control (i.e. self-efficacy, facilitating conditions).

To examine the relationship between consumer attitude toward using apparel mass-customization and purchase intention for mass-customized apparel, four types of purchase intention, (a) purchase intention for design mass-customized apparel, (b) purchase intention for fit mass-customized apparel, (c) purchase intention for personalization mass-customized apparel, and (d) overall purchase intention for mass-customized apparel were included in the study. To identify the factors predicting consumers' purchase intention for mass-customized apparel, in addition to the eight factors included in the examination of consumer attitude toward using apparel mass-customization, demographics (i.e., age, educational attainment, annual household income, annual clothing expenditure) and attitude toward using apparel mass-customization were also included as the independent variables.

Dress shirts were selected in the study as the product category in the investigation of apparel mass-customization. Goldsmith and Freiden (2004) reported that consumers considered dressy clothing more appropriate for mass-customization than casual clothing, suggesting that consumer behaviors may differ from one product category to another. For example, a consumer may be willing to purchase a fit mass-customized dress shirt because he wants to wear a well-fitting dress shirt to look professional at work, but may not be willing to purchase a mass-customized t-shirt because fit is less important in casual clothing. Male and female consumers' behavior in apparel purchase may differ. To increase the validity of the results, only males were recruited in the study. Previous studies suggested that men perceived less risk in online shopping and were more likely to purchase products from Internet websites than women (Garbarino & Strahilevitz, 2004; Korgaonkar & Wolin, 1999; Van Slyke, Communale, & Belanger, 2002). Based on these study results, men may be more likely to purchase mass-customized apparel than women because apparel mass-customization is currently performed mostly through the online retailing channel such as store websites. For men's dressy clothing, some websites, such as www.shirtsmyway.com and www.mytailor.com, offer mass-customized dress shirts and some well-known retailers, such as Lands' End and Brooks Brothers, also offer men's dress shirt in its custom section on its website to cater to consumers' desire for a specific design, a specific fit or a specific personalized feature. For example, customers may select fabric of the dress shirt, style of

the pocket, and type and number of the pleat for the design of the dress shirt. They may request specific measurements of the sleeve length and neck circumference to obtain a better fit. Consumers may also request the firm to embroider or print his initials on the pocket, cuff, or collar. Often times, the customer can select a thread color and a font style for the embroidery. Because men's mass-customized dress shirts can be a niche market for mass-customized dressy clothes, it was selected as the product category for the current study.

The specific objectives of the study are listed as below:

1. To examine the relationship between benefits sought (i.e. uniqueness seeking in apparel products, fit seeking in apparel products, deal seeking in apparel shopping), and perceived usefulness of apparel mass-customization.

2. To examine the relationship between innovativeness (i.e. fashion innovativeness, technology innovativeness) and self-efficacy in using apparel mass-customization.

3. To examine the relationship between perceived usefulness of apparel mass-customization and attitude toward using apparel mass-customization, and the relationship between perceived behavioral control in using apparel mass-customization (i.e. self-efficacy, facilitating conditions) and attitude toward using apparel mass-customization.

4. To examine the relationship between overall attitude toward using apparel mass-customization and overall purchase intention for mass-customized apparel.

5. To examine which variables included in the study (i.e., uniqueness seeking, fit seeking, deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness of apparel mass-customization in general, perceived behavioral control in using apparel mass-customization in general, self-efficacy in using apparel mass-customization in general, facilitating conditions in using apparel mass-customization in general, overall attitude toward using mass-customization) are the best predictors of overall purchase intention for mass-customized apparel.

6. To examine which variables included in the study (i.e., uniqueness seeking, fit seeking, deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness of design mass-customization, perceived behavioral control in using design mass-customization, self-efficacy in using design mass-customization, facilitating conditions in using design mass-customization, attitude toward using design mass-customization) are the best predictors of purchase intention for design mass-customized apparel.

7. To examine which variables included in the study (i.e., uniqueness seeking, fit seeking, deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness of fit mass-customization, perceived behavioral control in using fit mass-customization, self-efficacy in using fit mass-customization, facilitating conditions in using fit mass-customization, attitude toward using fit mass-customization) are the best predictors of purchase intention for fit mass-customized apparel.

8. To examine which variables included in the study (i.e., uniqueness seeking, fit seeking, deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness of personalization mass-customization, perceived behavioral control in using personalization mass-customization self-efficacy in using personalization mass-customization, facilitating conditions in using personalization mass-customization, attitude toward using personalization mass-customization) are the best predictors of purchase intention for personalization mass-customized apparel.

Operational Definitions

The following is a list of definitions of important concepts and major variables included in this study.

1. **Apparel mass-customization** is the production of individually customized apparel by using flexible processes and organizational structures at the low cost of a standardized, mass-production system.

> The definition of apparel mass-customization was developed by the researcher based on Hart's (1995) definition of mass-customization. "the use of flexible processes and organizational structures to produce varied and often individually customized products and services at the low cost of a standardized, mass-production system" (p. 36). By retaining the keywords in Hart's definition that represents oxymoronic meaning of mass-customization (i.e.. individually customized products, low cost of mass- production system) and by explaining the premise of mass-customization but specifying the situation to apparel mass-customization business, apparel mass-customization was defined as above.

2. **Design mass-customization** is a type of apparel mass-customization, which allows consumers to select design (e.g., style, fabric, color) preferences. Consumers can view their selection through a computer illustration before the manufacturer begins producing the garment.

> The definition of design mass-customization was developed by the researcher based on Burns and Bryant's (2005) description of apparel mass-customization in design. Burns and Bryant indicated that, in design mass-customization, consumers can select design features such as style, fabric, or color, and that the selection process of the design mass-customization can be performed by using technologies such as computer illustration.

3. **Fit mass-customization** is a type of apparel mass-customization, which allows customers to provide one or more body measurements to the manufacturer for production of a garment that specifically fits the customer's body.

> Burns and Bryant (2005) described fit mass-customization of apparel as the production of garments that were specifically made-to-measure. In implementing fit mass-customization, the measurements needed for garment construction can be provided by the customer who ordered the item or the customer's body parts can be measured by the manufacturer. The researcher of the current study used Burns and Bryant's concept of made-to-measure, the nature of fit mass-customization, but explained the process more in detail.

4. **Personalization mass-**customization is a type of apparel mass-customization that allows customers to add personalized details such as a monogram, personal embroidery, laser stitching, or fabric ornamentation to a purchased item.

> The definition of personalization mass-customization was based on Burns and Bryant's (2005) description that personalization mass-customization can be performed by adding design details (e.g. monogram, personal embroidery, laser stitching, or fabric ornamentation) to a purchased or an existing garment.

5. **Benefits sought in apparel products** are the specific advantages that consumers look for in apparel products.

> Bradmore (2004) defined benefits sought as "the specific advantages looked for in products when buyers purchase them." Based on this definition and applying to the

scope of apparel shopping, benefit sought in apparel products were stated as above.

6. **Uniqueness seeking in apparel products** is a consumer's behavior to look for specific design or construction attributes in apparel products that can distinguish them from others.

> The definition of uniqueness seeking in apparel products was developed by the researcher based on the concept from the Uniqueness Theory (Snyder & Fromkin, 1980) and the definition of consumer need for uniqueness given by Tian, Bearden and Hunter (2001). According to the Uniqueness Theory, uniqueness attributes were described as characteristics that people manifest their differences within the range of social acceptance. Applying the description of uniqueness attributes from Uniqueness Theory to consumer behavior, Tian, et al. defined the consumer need for uniqueness as "the trait of pursuing differentness relative to others through the acquisition, utilization, and disposition of consumer goods" (p. 52). Based on the concept of uniqueness from Uniqueness theory and Tian et al.'s definition of consumer need for uniqueness, and specifying the consumer behavior to apparel purchasing situation, the above definition of uniqueness seeking in apparel products was developed.

7. **Fit seeking in apparel products** is a consumer's behavior to look for apparel products that conform correctly to the shape or size of the consumer's body.

> The definition of fit seeking in apparel products was developed by the researcher based on the definition of "fit" from online Merriam-Webster dictionary (n. d.) "to conform correctly to the shape or size of" and based on previous studies, which reported that many consumers were not satisfied with the fit of ready-to-wear garments (Alexander, Connell, & Presley, 2005; De Klerk & Tselepis, 2007; Endo & Kincade, 2005; Kinley, 2003; Pisut & Connell, 2007; Workman & Lentz, 2000) and that they desired for better fit (Fiore et al., 2003). Based on the definition of fit from online Merriam-Webster dictionary and the previous study results, the researcher conceptualized fit seeking as a consumer behavior to minimize the dissatisfaction from ill-fitting garments, and therefore, defined fit seeking as above.

8. **Deal seeking in apparel shopping** is a consumer's behavior to look for good bargains in apparel shopping.

> The researcher developed the definition of deal seeking in apparel shopping based on the description of deal proneness, "the characteristic of consumers who desire to get a good bargain" (Arnould, Price, & Zinkhan, 2002). Applying the general consumer behavior of deal seeking and narrowing down the deal seeking in apparel shopping situation, the above definition was derived.

9. **Innovativeness** is "the degree to which an individual is receptive to new ideas" (Midgely & Dowling, 1978, p. 236).

10. **Fashion Innovativeness** is the degree to which an individual is receptive to new apparel styles and is willing to buy and wear new apparel products.

> The definition of fashion innovativeness was developed by the researcher based on Midgely and Dowling's definition of innovativeness; that is, "the degree to which an individual is receptive to new ideas" (p. 236), and Goldsmith, Moore, & Beaudoin's (1999) description of fashion innovators' characteristics. Based on Goldsmith et al., fashion innovators were more likely to shop frequently and they spent more money for clothing, compared to fashion followers. Therefore, the definition of fashion innovativeness is stated as above.

11. **Technology Innovativeness** is an individual's degree of receptiveness to new technology and tendency to be the first using new technologies.

> Bruner and Kumar (2007) defined a consumer who is an innovator in adopting new technology as "a consumer with high intrinsic motivation to adopt and use a variety of leading-edge, technology-based goods, as well as the services that compliment them" (p.330). Along with this definition, Roger's (1983) Diffusion of Innovation Theory indicated that innovators adopt new ideas or products before other consumer segments such as early adopters, early majority, late majority, and laggards, and thus, innovators are the consumers who adopt an innovation first. The definition of technology Innovativeness was developed as above by combining Bruner and Kumar's description of

technology innovators, Roger' description of the characteristic of innovators in adopting an innovation, and Midgley and Dowling's (1978) definition of innovativeness.

12. **Perceived usefulness of apparel mass-customization** is the degree to which a consumer believes that using mass-customization would be helpful in apparel shopping.

    The definition of perceived usefulness of apparel mass-customization is based on the concept of perceived usefulness in Technology Acceptance Model proposed by Davis (1989). Davis defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). Davis's definition of perceived usefulness was based on a situation where the respondents perceived usefulness of a system in enhancing the job performance. However, in the current study, the researcher's interest lied on consumers' belief on whether apparel mass-customization will be helpful in apparel shopping or not. Therefore, the concept of enhancement of job performance was removed and it was replaced by "helpful in apparel shopping."

13. **Perceived behavioral control in using apparel mass-customization** is consumers' perception of the ease or difficulty of using mass-customization in apparel shopping.

    The definition of perceived behavioral control in using apparel mass-customization is based on the definition of perceived behavioral control in the Theory of Planned Behavior: 'people's perception of the ease or difficulty of performing the behavior of interest' (Ajzen, 1991, p. 183).

14. **Self-efficacy in using apparel mass-customization** is an individual's self-confidence in his or her ability to use mass-customization in apparel shopping.

    Taylor and Todd (1995) defined self-efficacy as "an individual's self-confidence in his/her ability to perform a behavior" (p. 139). Applying this definition to the behavior of using mass-customization in apparel shopping, the definition of self-efficacy in using apparel mass-customization was stated as above.

15. **Facilitating conditions in using apparel mass-customization** is a consumer's belief on whether he or she has access to the resources and opportunities needed to use mass-customization in apparel shopping.

> Facilitating conditions was referred as "availability of resources and opportunities needed to perform a behavior" (p. 139) in the Theory of Planned Behavior (Taylor & Todd, 1995). Applying Taylor and Todd's definition of facilitating conditions to the situation of apparel mass-customization, the definition of facilitating conditions in using mass-customization in apparel shopping was stated as above.

16. **Attitude toward using apparel mass-customization** is an individual's consistently favorable or unfavorable response with respect to using apparel mass-customization as a way of shopping apparel.

> Fishbein and Ajzen (1975) defined attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" (p. 6). The researcher kept the original definition of attitude from Fishbein and Ajzen but specified the 'given object' as 'using apparel mass-customization as a way of shopping apparel'. Therefore, the definition of attitude toward using apparel mass-customization was stated as above.

17. **Purchase intention for mass-customized apparel** is a person's subjective probability of purchasing the mass-customized apparel.

> Behavioral intention in the Theory of Reasoned Action was defined as "a person's intentions to perform various behaviors" and stated that the strength of behavioral intention can be indicated by the person's subjective probability (Fishbein & Ajzen, 1975, p.12). The researcher applied the concept of behavioral intention but narrowed down the scope of the behavior to the purchase of mass-customized apparel. Therefore, the definition of purchase intention for mass-customized apparel was stated as above.

CHAPTER II

LITERATURE REVIEW

In this chapter, previous literature on mass-customization, innovativeness and benefit sought are reviewed in three sections. In the section of mass-customization, the definition of mass-customization, criteria of adopting mass-customization, implementation of mass-customization, factors in the success of mass-customization, types of mass-customization, and previous research on apparel mass-customization are reviewed. In the section of innovativeness, definition of Innovation, types of innovativeness, diffusion of Innovation theory, Innovativeness and mass-customization are discussed. In the section of benefit sought, types of benefit sought (i.e., uniqueness seeking, fit seeking, economic value seeking) are reviewed. A summary of literature review is provided in the last section of the chapter.

Mass-Customization

As business environment is adapting the consumers' wants and needs at a higher level, market niches have become so specific that market segmentation has arrived to a point where each segment can be each consumer (Gilmore & Pine, 1997). Davis (1996) stated that mass-customized products target markets of one referring to the finest segmentation ever. Mass-customization incorporates the possibility of making profit by capitalizing economies of scale in mass-production and by taking the advantage of meeting exactly what the customer wants and needs in customization. By adopting mass-customization, companies increase customer satisfaction and build competitive advantage against their competitors.

Definition of Mass-customization

Pine II (1993) stated, in his book *Mass Customization,* that mass-customization is 'a business paradigm that creates variety and customization through flexibility and quick responsiveness' (p. 44). According to Pine, mass-customization is the production and distribution of customized goods and services on a mass basis. Hart (1995) defined mass-customization as 'the use of flexible processes and organizational structures to produce varied and often individually customized products and services at the low cost of a standardized, mass-production system' (p. 36). The goal of mass-customization is 'to provide customers with anything they want profitably, any time they want it, anywhere they want it, any way they want it' (p. 36). Consistent with the statement of Hart, Tseng and Jiao (2001) explained that mass-customization is an extreme consumer-oriented business orientation. The purpose of adopting mass-customization in business is to provide affordable products with the variety and customization to the customers so that individual customers can obtain the products that they exactly want and need (Tseng & Jiao). Burns and Bryant (2005) used the term "sell one, make one" to describe how mass-customization works in apparel industry, emphasizing the fact that the customer pays for the product first and then production or assembly begins, which is different from the traditional mass-production system where clothes are made first and then sold through retailers. In the current study, mass-customization is defined as a production method that combines mass-production and customization to better serve customers by providing them the products that meet customers' wants and needs at the individual level.

Criteria of Adopting Mass-customization

Many researchers have discussed the factors that enable the adoption and facilitate the implementation of mass-customization. Pine II (1993) suggested two criteria that enable success in mass-customization, and they were (a) low prices that benefits from using economies of scale and (b) the business environment where niche markets can become smaller so that companies can reach consumers at the individual level. In other words, if a company cannot produce its products in lower prices and if the business environment does not allow the company to reach consumers at individual level consumers, mass-customization approach will not be successful.

Hart (1995) suggested that to consider adopting the approach of mass-customization, companies need to consider four factors (i.e. customer sensitivity, process amenability, competitive environment, organizational readiness). Among the four factors, customer sensitivity is the most important factor for the success of mass-customization. Customers' demand for uniqueness needs to be high, and the gap between the desired product and the available mass-produced product need to be big. Consistently, Endo and Kincade (2005) studied the online customized shoes sector and found that time poverty and fit problem were the two common potential buyers' characteristics. These buyers had needs in saving time and finding shoes that fit. For example, a full-time worker who is a mother of two children and who has wide feet may have a strong potential to purchase a pair of shoes through the website of customized shoes producer. Radder and Louw (1999) also suggested that to consider adopting mass-customization, marketers and manufacturers should consider if customers really have unique needs, care about mass-customization, and are willing to pay more and wait longer.

Implementation of Mass-customization

For implementing mass-customization, many researchers have noticed the importance of getting accurate information from customers. Consumers play an important role by involving in product development at least at a certain stage and they are the ones who exactly know what they want and need. Therefore, the more customers informs the company of their preferences, the better the company can provide exactly what the customers desire (Pine II, 1993 ;Von Hippel, 1998; Westbrook & Williamson, 1993). Da Silveira, Borenstein, and Fogliatto (2001) listed four steps to transfer consumer information. The first step is to define a catalogue of options that will be given to the consumers. The second step is to collect and store information on customers' choices from the catalogue of options. After receiving information necessary for production, the data is transferred from store to manufacturer. Finally, the manufacturer translates customer choice data to product design features and manufacture instructions. May-Plumlee and Little (2006) developed the model of proactive product development integrating consumer requirements. This model helps understand how consumers' input is considered throughout the product development process and how consumers' input plays a significant role in the product development of mass-customization.

Many researchers found that adopting the latest technologies, including computer-aided design (CAD), computer-aided manufacturing (CAM), 3D body scanning, and 3D pattern making technology, was critical in successfully implementing mass-customization (Apeagyei & Otieno, 2007 ; Bae & May-Plumlee, 2005; Broekhuizen & Alsem, 2002; Chow & Holden, 1997; Du, Jiao, & Tseng, 2003; Istook, 2002; Loker & Oh, 2002; Pitta, 1998; Swink & Hegarty, 1998; Wikstrom, 1996). Apeagyei and Otieno (2007) examined the usability of pattern customizing technology in the process of testing the fit for mass-customization of apparel and found that the 3D software for fit provision and testing still needed more advancement and improvement but the 3D pattern customizing technology did provide better evaluation of fit. Daanen and Hong (2008) found that the skirt made through made-to-measure pattern maker by 3D whole body scan fitted better than through the1D scan-derived measures.

Vesanen and Raulas (2006) developed a model for identifying possible hurdles throughout the implementation of mass-customization, in steps such as customer data processing, customized production, delivery, and interactions. The researchers identified nine hurdles including lacking of customer data, having various consumer data in different databases, having incorrect customer data, failing to profile and segment customers according to the company's objectives, failing to target the customers properly, company's marketing strategies not being noticed or not being processed by customers, not understanding customers' channel preference, inadequate execution of the production or delivery performance, and not being able to perform interactive marketing. This model provides a tool for the marketers to identify possible hurdles or threats to successfully manage the business of mass-customization. Pan and Holland's (2006) findings supported Vesanen and Raulas's (2006) model, indicating that apparel firms that implemented mass-customization did have some degree of inefficiency despite the adoption of information technology. The findings imply the possibility of decreasing delays and confusions and improving productivity by eliminating duplicated processes in supply chain, for example, eliminating repeated communications throughout the production process.

Kincade, Regan, and Gibson (2007) investigated the facilitation of mass-customized apparel production using the concept of concurrent engineering. Concurrent engineering is defined as a method of product development where all product development specialties present at the beginning of the project in order to streamline the product development process (Anderson, 1997, p. 218). To implement concurrent engineering, multifunctional design teams

consisting of people who specialize in various areas such as product design and development, manufacturing, service, marketing, finance, quality control and testing, will enable flexible and agile manufacturing system. The authors found that concurrent engineering strategy enabled and facilitated apparel mass customization, and was implementable in actual apparel product development settings. However, in order to make apparel mass-customization possible through the concurrent engineering strategy, processes in the traditional procedure had to be realigned or moved. For example, manufacturability or costing came earlier than the design process versus later in traditional apparel design process, where designing first was prevalent.

Factors in the Success of Mass-customization

Anderson (1997) noted that flexibility, responsiveness, cost reduction, and quality are the four important factors in the success of mass-customization business. The first factor, flexibility, may be achieved through the build-to-order process (i.e., manufacturing a product after an order is placed by a customer). The second factor, responsiveness, may be increased by keeping product parts available to reduce the production time. Along with quicker delivery, quick response can be achieved. Customers can receive their order in a short period of time. The third factor, cost reduction, may be performed through reducing inventory and overhead. Broekhuizen and Alsem's (2002) also emphasized the importance of product cost in the success of mass customization, suggesting that cost reduction could be achieved through harmonizing all the external factors (e.g., customer, product, market, industry) and internal factor (e.g., company capabilities). For example, a company may reduce cost and obtain competitive advantage if it has a small but right customer base (Mason & Ezell, 1993) that consists of consumers who have high potential to purchase mass-customized products, and at the same time, has computer-aided design technology equipped in the manufacturing facility to produce mass-customized products. The fourth factor, according to Anderson (1997), was product quality. Broekhuizen and Alsem (2002) indicated that to be success in mass-customization, consumers' perceived benefits must be higher than perceived costs. When customers are paying premium to have their clothing customized, they would expect a product of good quality.

Researchers have categorized mass-customization based on the stage of product development process in which consumers participate and are involved in with the development.

Categorization of Mass-customization Based on the Level of Modularity

Numerous researchers both in engineering and in apparel sectors have studied mass-customization (Anderson-Connell, et al., 2002; Broekhuizen & Alsem, 2002; Cho & Fiorito, 2009; Duray, 2002; Fiore, et al., 2003; 2004; Kincade, et al., 2007; Lee et al., 2002). Most authors categorized mass-customization based on the level of modularity and whether the consumer involvement begins earlier in the product development process or rather later. Pine II (1993) and Duray, Ward, Milligan, and Berry (2000) argued that modularity is a key factor in achieving economy of scale (or volume) in mass-customization and suggested that apparel mass-customization may use cut-to-fit modularity. The cut-to-fit modularity is the combination and/or modification of the cut modules. For example, a firm that offers dress shirt mass-customization through cut-to-fit modularity will have dress shirt components such as collar, pocket, and cuff in various styles in stock as modules. When the manufacturer receives an order from a customer who wants a dress that has a medium spread button down collar, an inverted pleat pocket, and French cuffs, it assembles a dress shirt with the components that the customer specified in the order. In this way, various styles and sizes of garments can be produced to fulfill the needs and desires of different consumers.

Similar to the concept of modularity, Kincade and Gibson (2010) used the term 'componentization' to explain how standardized components can be assembled and sewed to produce mass-customized apparel at a lower cost. Therefore, Kincade and Gibson's idea of componentization is in accordance with Gilmore's cut-to-fit modularity. Using many different existing components, a firm can develop different products without having to go through many different product development processes. For example, a firm may use the same front and back patterns for short, three-quarter, and long sleeve shirts to manufacture different types of shirts. Therefore, componentization or modularity is crucial in implementing apparel mass-customization. Because of this reason, many authors categorized mass-customization based on the level of modularity.

The degree of modularity and the degree of variety that a manufacturer can provide in a product is in an opposite relationship. When the level of modularity is high, the level of variety is low, and when the level of modularity is low, the level of variety is high. For example, if a manufacturer offers standard size dress shirt with the selections of two types of fabrics, three types of collar, two types of pocket, three types of sleeves, it can offer 36 different mass-customized dress shirts (2 x 3 x 2 x 3 = 36 different combinations). Each piece as a part of the design feature in dress shirts comes in a module and the module pieces are combined to make different dress shirts increasing modularity. In this case, the level of modularity is high and the level of variety is limited to 36 different options. Different from the above case, when a manufacturer allows its customers to design their own pocket and sleeve styles and if the product can be made according to the customer's body measurements, the level of modularity is lower but the level of variety is higher than the case exemplified because the firm has to produce a garment by cutting the components based on the customer's design, instead of by using existing standardized components.

Researchers have identified many different types of mass-customization. The differences in types of mass-customization can range from very low level of modularity (standardization) and very high level of variety (customization) to very high modularity and very low variety. Table 2.1 shows different types of mass-customization based on the level of modularity from previous literature.

In one of the earliest studies, Lampel and Mintzberg (1996) developed a continuum of strategies which consists of five levels of customization (i.e. pure customization, tailored customization, customized standardization, segmented standardization, pure standardization) based on the level of standardization and customization along the process of design, fabrication, assembly, and distribution. The authors identified three forms of mass-customization strategies (i.e. tailored customization, customized standardization, segmented standardization), which came in between pure customization and pure standardization. In tailored customization, design process of the product is standardized but fabrication, assembly, and distribution is customized. During the tailored customization, a product prototype is presented to a potential buyer and then based on customers' needs, the product is tailored. For example, a customer who decides to purchase a mass-customized t-shirt through tailored customization may select fabric, select style features of the product, measure his or her body, and request that the manufacturer produces the

Table 2.1 Types of Mass-customization in Previous Research

Literature / Level of Modularity	Lampel & Mintzberg (1996)	Gilmore & Pine (1997)	Duray, Ward, Milligan, & Berry (2000), Duray (2002)	Anderson-Connell, Ulrich, & Brannon (2002)	Burns & Bryant (2005)	
Very low modularity and very high levels of design/fit differences (variety)	Tailored customization	Collaborative customization	Fabricators	Totally custom	Design customization	Fit customization
Low modularity and mid to high levels of design/fit differences			Involvers	Co-design*		
Medium modularity and medium levels of design/fit differences						
High modularity and low levels of design/fit differences	Customized standardization		Modularizers	Design options with standardized sizes		
Very high modularity with limited or no design/fit differences		Cosmetic customization	Assemblers		Personalization	

Notes: Gray-shaded columns are the sources that provided apparel-specific categorization of mass-customization.
   * The term co-design was used as keywords in many other previous studies including Lee, Kunz, Fiore, & Campbell (2002), Ulrich, Anderson-Connell, & Wu (2003), Choy & Loker (2004), Fiore, Lee, & Kunz (2004), and Cho & Fiorito (2009)

t-shirt according to his or her specification. In customized standardization, design and fabrication are standardized and assembly and distribution are customized. Standardized components of design and fabrication are presented for the customer to select. Thus, customized standardization uses a higher level of modularity compared to tailored customization. Segmented standardization strategy deals with customization only at the distribution stage. The firm presents various products by expanding product dimensions but not at individual customer's request. An example of standardized customization may be providing customers a few shipping options, such as overnight shipping, second day air shipping, or ground shipping at the checkout step of apparel online shopping. Among the five types of production that Lampel and Mintzberg identified, only tailored customization and customized standardization can be considered as types of mass-customization that were the hybrid of customization and mass-production, while the other three types (i.e., pure customization, segmented standardization, pure standardization) were either pure customization or pure mass-production, or only deals with customization at the most downstream part of the distribution stage. Therefore, only tailored customization and customized standardization were shown in Table 2.1 as two types of mass-customization.

Gilmore and Pine II (1997) categorized the approaches of general mass-customization into four types: collaborative customization, adaptive customization, cosmetic customization, and transparent customization. Collaborative customization can be performed by communicating with a customer to facilitate the specification of the customer's needs and to make customized products. For example, Lands' End practices collaborative fit customization on its website. When a consumer chooses to buy a certain style of corduroy pants, he or she can choose the inseam length of his or her preference from a dropdown selection. In this way, Lands' End and its customers can communicate the need in a specific fit without engaging in an extended communication. Adaptive customization allows customers to alter the way they use products after the purchase. For example, Victoria's Secret's 100 ways bra allows customers to wear the bra in many different ways (e.g. standard, racer back, one shoulder, strapless) for different occasions by using zero to two straps or by hooking the straps to different loops. This bra is differentiated from the bras that come in only one form. In cosmetic customization, simple information about the customer can be included in product. For example, monogramming initials is one of the most popular ways of mass-customizing apparel (e.g. dress shirts, sweaters, jackets, tote bags), bedding, and towels. The fourth type of mass-customization is transparent

customization, which monitors how customers are using the product after purchase. This is a customization that can be implemented in service sector versus in product manufacturing sector. For example, a car salesman may call his/her customers to monitor and notify scheduled car maintenance. This type of mass-customization is not widely implemented in the apparel industry because it would be costly to monitor each and every customer's usage, and consequently will not bring much benefit to the firm. Among the four types of mass-customization that Gilmore and Pine identified, only two (i.e. collaborative customization, cosmetic customization) were included in Table 2.1 because these two types can be applied to product mass-customization. Transparent customization is a type of customization for service customization and adaptive customization provides consumers options of using the product that they purchased. Consumers do not involve in the process of product development. Therefore, transparent customization and adaptive customization were not shown in Table 2.1

Duray's (2002) four archetypes (i.e. fabricators, involvers, modularizers, assemblers) are firms that conduct different types of mass-customization. The criteria for differentiating the four archetypes are the level of customer involvement and modularity of the product. The higher the level of customer involvement in product development process, the lower the modularity in production process. Fabricators are the firms that allow customers to be involved in the very early stages of product development such as making a prototype of a product. Customers can design their own clothes from the beginning of the product development process. Involvers are the firms that also allow customers' participation in the early product development stages, but not as early as allowed by fabricators. Many of the early design decisions or fabrications are already made by the manufacturer. Customers cannot design their own fabric but they are able to choose fabrics from the options provided. For example, Brooks Brothers offers mass-customized dress shirts for customers to choose the fabric from a few fabric options that they provided on its website. Customers who purchase apparel from involvers will not be able to design their own clothes from the beginning of the product development process but are able to select components of the product from existing design options. Modularizers provide customers with a higher degree of modularity and a lower level of variety than fabricators and involvers, which makes them closer to mass-producers. Customers who purchase apparel from modularizers cannot have a major modification done to the already existing design option that the manufacturer provides but can choose design features that have a limited impact on the overall design. For example, a

jeans company may allow its customers to choose the type of fly, such as a button fly or a zip fly but does not allow the change of the overall style of the jeans. Assemblers allow customers to be involved in the later stage of the product development process. Customers are able to choose from ready-made options presented by an assembler in the assembly or delivery stage. For example, assemblers may provide several styles and sizes for customers to choose. Customers can select a style and specify his/her size, and ask the assembler to manufacture the product for them. All four types of mass-customization identified by Duray (2002) (i.e. fabricators, involvers, modularizers, assemblers) are shown in Table 2.1.

Through conducting a focus group analysis, Anderson-Connell et al. (2002) categorized four different types of apparel mass-customization: (a) totally custom, (b) co-design, (c) design options with standardized sizes, and (d) clothes clones. The totally custom option allows customers to participate in the product development process as early as designing major elements in a garment such as style selection or fabric design. The most commonly used term in apparel mass-customization is co-design. Co-design process provides "professional assistance in assessing fashion selections, making design choices, and facilitating image depictions on a computer screen" (Anderson-Connell, et al., p. 254). Co-design includes selecting design elements such as colors, styles, and details of a garment from options provided by the firm for design mass-customization, providing body measurements to the manufacturer for fit mass-customization, or a combination of both design and fit mass-customization, with varying levels of modularity. Design options with standardized sizes allows customers to select from provided design options of different components in a standard size. Customers are not involved in the early product development stages such as selecting fabric/materials or designing the product. For example, Timberland offers customers to choose color combination of its boots or boat shoes from its website but the shoes only come in standard shoe sizes. It does not offer an option for customers to provide their own foot measurements. The last type of apparel mass-customization identified by Anderson-Connell et al. is clothes clones. Clothes cloning refers to producing exact copies of a customer's favorite clothes. Customers may clone their clothes that has the best fit, is comfortable, or is most flattering. Clothes cloning can also refer to a particular apparel item replicated in seasonal fabrics or in updated fashion colors. Clothes cloning was not included in Table 2.1 because this type of apparel mass-customization was unique to Anderson-Connell et al., and thus, was found to be difficult to compare with other categorization of mass-customization.

Burns and Bryant (2005) listed three types of mass-customization used in apparel industry (i.e., design customization, fit customization, personalization). Design customization is where a customer can choose style preferences such as colors, fabric, design features, or may even totally design a garment that the customer exactly wants. In design customization, the level of modularity may differ depending on consumers' wants and needs. Some consumers may want to design their own clothes from scratch, while many others may prefer to choose from a number of options that company provided. Fit customization is used to manufacture a garment after measuring the customer's body dimensions to make the product to exactly fit the customer's body (i.e., made-to-measure) or to make the customer to provide his/her body measurement(s) needed for producing the apparel product. Fit customization may not need extensive customer involvement in the product development process, but it requires customers' willingness to measure their body in order to take the measurements needs for the production of fit-customized apparel. Fit-customization of apparel can be a way to solve the existing problem in fit and the sizing issue in apparel industry. In Table 2.1, design and fit customization are shown in parallel columns because a manufacturer can provide a mass-customized product with different levels of modularity in design and fit of an apparel product. For example, one manufacturer may provide totally custom, offering products with very high variety (very low modularity) in both design and fit, while another manufacturer may produce clothes with standardized sizes but allow customers to order a product that has their own design by offering design options. This will result in the manufacturing of a product that has a high level of variety (low level of modularity) in design but a low level of variety (high modularity) in fit. Personalization is the third type of apparel mass-customization that Burns and Bryant listed. Personalization is applied to the finished products to add value to the products, and customers do not participate in the early stages of product development. Currently, personalization is the type of apparel mass-customization that is most commonly practiced because apparel firms can take advantage of high modularity without having to involve in extensive communication with customers or spend much money to provide higher variety in a product. Many apparel companies such as L.L. Bean, J.Crew, and Land's End offer personalization to their customers by providing a monogramming option for some of their products (e.g. dress shirts, sweaters, tote bags, bath towels, beddings).

Comparisons of the Level of Modularity in Various Types of Mass-customization

Among the various types of mass-customization shown on Table 2.1, totally custom (Anderson-Connell et al., 2002) requires very low modularity but very high level of customization. Fabricators (Duray, 2002) are most likely to be involved in totally custom (Anderson-Connell et al., 2002), tailored customization (Lampel & Minizberg, 1996), and collaborative customization (Gilmore & Pine, 1997) to provide high levels of design and fit varieties. Involvers are the firms that can perform tailored customization (Lampel & Mintzberg, 1996) or collaborative customization (Gilmore & Pine, 1997) through the co-design process (Anderson-Connell et al., 2002; Ulrich et al., 2003), whereby collaborative communications between the customer and firm are required. Involvers allow customers to choose design or fit options, and in doing so, they provide products with low to mid level of modularity. Modularizers provide design options with standardized sizes (Anderson, 1997; Anderson-Connell et al., 2002), and thus, the production process requires high modularity (Kincade & Gibson, 2010) but little design differences. Assemblers perform mass customization with the highest degree of modularity. Customized standardization (Lampel & Mintzberg, 1996), cosmetic customization (Gilmore & Pine, 1997), and personalization (Burns & Bryant, 2005) can be practiced by assemblers and may provide personalized goods (e.g. a dress shirt with monogram embroidered on a cuff). Design customization and fit customization can be conducted in various degree of modularity through collaborative customization (Gilmore & Pine, 1997), totally custom, co-design, and design option with standardized sizes (Anderson-Connell et al., 2002). Personalization can be considered as a design customization with a very high modularity (very low variety) and it does not provide fit customization. Therefore, in Table 2.1, personalization is on the same column of design customization, but excluded in the fit customization.

Previous Research on Mass-customization

In the following section, previous research related to mass-customization of apparel are summarized to illustrate how willingly apparel consumers would adopt the new method of purchasing apparel and how technology has been used to implement mass-customization of apparel. Research related to apparel mass-customization is limited because it has not been a long

time since mass-customization was first adopted in apparel industry by Levi Strauss in 1994 when it introduced its 'Personal Pair'(Pine, 1996) and it is still in its initial stage. Among these studies, research has been mainly focused on consumers' attitude towards mass-customization.

Consumers' Attitude towards Mass-customization

Many researchers have examined consumers' attitude towards mass-customization. Goldsmith and Freiden (2004) found that consumers' general attitude toward mass-customization is positive. The participants of this study had higher level of education; 67% of the participants were college graduates or had graduate education. Over a half of the participants were either owner of business or had professional career, and had high income level. In this study, nearly half of the respondents had experience purchasing mass-customized products and they were satisfied with their purchases. The purchased product categories include dressy clothes, casual clothes, and cosmetics. This study showed that the likely buyers of mass-customized products tended to be younger (25-45 years old) consumers with higher education level and higher income level. These results are consistent with Wikstrom's (1996) argued that in order to make mass-customization successful, it is important that the concept of mass-customization is supported by the consumers who usually have a higher level of education and a higher level of demand for mass-customized products. Goldsmith and Freiden (2004) found that dressy clothes were more likely to be the candidate for mass-customization than customizing casual clothes. Almost two third of the respondents (61%) thought customizing dressy clothes to be very appropriate while only 25% of the respondents reported that customizing casual clothes was very appropriate. Choy and Loker (2004) studied the customer involvement in the design process of mass-customization of wedding gowns through the Internet, and found a consistent result as that of Goldsmith and Freiden (2004). Respondents had a high willingness in involving in the design process of wedding gowns. Lee et al. (2002) studied the acceptance of mass-customization in apparel and found that consumers were most likely to customize jeans (62%) followed by swimwear (27%), dresses (21%), intimate apparel (18%), and special occasion wear (18%).

Kamali and Loker (2002) found that price was a significant factor in identifying willingness to purchase mass-customized t-shirts. Overall, consumers showed high willingness to purchase mass-customized t-shirts but were not willing to pay too much for them. This result is

different from Bardakci and Whitelock's (2004) research on how ready consumers were for purchasing mass-customized cars. In this research, customers were willing to pay a premium for a customized car, willing to wait to a reasonable period to receive the mass-customized car, and were willing to invest a reasonable period of their time to specify their preferences. These results seem to suggest that consumers are willing to pay for a certain amount of money for high-priced products such as cars, but unwilling to pay for the price of mass-customized price for low-priced products such as apparel. Kamali and Loker (2002) identified the price range for mass-customized t-shirts and it was between $16 and $20.

Anderson-Connell et al. (2002) had identified other consumers' concerns over ordering mass-customized apparel through online channel, such as time, convenience, equipment, and privacy. Consumers also expressed the concerns in design process including lack of ability to participate in the design process without much of professional help, lack of creativity to be involved in such activity, and lack of technical skills such as not being able to use CAD system. The authors developed a consumer-driven model for mass customization in the apparel market, which incorporated the technologies (e.g. smartcard, body scanning) that can be used in the apparel mass-customization process and how such technology could contribute to the four different types of apparel mass-customization: totally custom, co-design, clothes clones, and design options with standard sizes. In totally custom option, customers are the most involved in the product development process. In ordering totally custom apparel, customers are not only able to design the garment, fabric, and color but also get the garment made-to-measure so that the garment fits to their body perfectly. Co-design option is where consumers input their wants and needs in terms of style selection and communicate with designers or manufacturers to develop products. Fiore et al. (2004) found that consumers' resulting in purchase of unique product and exciting experience in the co-design process were important motivations for willingness to use co-design. In the process of co-design, consumers wanted to try on ready-to-wear samples or view computer images of customized product on the photograph of their own body (Lee et al., 2002). In the third type of apparel mass-customization, clothes clones are made when a customer wants a copy of their favorite clothes or when a customer wants a particular item replicated in seasonal fabrics or in different colors. In design option with standard sizes, customers select a certain style of garment from the selection that is already provided by designers or manufacturers. In such way, the company may offer additional value for their customers.

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There were a couple studies that used online shopping simulation that allowed consumers to experience the shopping process of apparel mass-customization. In the study of Endo and Kincade (2008), the 20 participants were provided an opportunity of ordering a pair of mass-customized shoes through a website. The participants received a pair of mass-customized shoes as they ordered after three weeks of waiting for the products. After they wore the shoes for a brief period of time, participants were interviewed about their attitude toward mass-customized shoes. After the interview, the participants were asked to repeat the process, going through another phase of buying mass-customized shoes and being interviewed. Using this qualitative researcher method, the authors categorized the participants into three types of consumers (i.e., holistic consumers, ardent consumers, and apathetic consumers. Holistic consumers were those who had essential needs in terms of design and fit and were interested in purchasing mass-customized shoes to fulfill the needs. Ardent consumers were interested in purchasing mass-customized shoes but also interested in purchasing mass-produced shoes. Apathetic consumers were not interested in ordering mass-customized products again. The results demonstrated that consumers who were very interested in mass-customized shoes were the consumers who had very high needs for mass-customized shoes, participated in high levels of communication and interaction with the firm in order to specify their needs, and were willing to engage in a long-term relationship with the firm. The authors noted that one of the two main factors in mass-customization shopping was needs for products and needs for services, and these need for mass-customization of shoes were closely related to the needs for design and fit. In other words, consumers who had a hard time finding the design or fit that they wanted among the mass-produced shoe market, had higher needs of mass-customized shoes, and therefore, were more willing to order a mass-customized pair.

Cho and Fiorito (2009) created a simulated website for shopping mass-customized jeans to investigate the relationships between perceived security of shopping mass-customized jeans online, perceived ease of use, perceived usefulness, trust, and attitude toward online apparel mass-customization. Three hundred female participants within the age range of 19 to 76 went through the process of shopping mass-customized jeans. The researchers offered variation in design and fit of the jeans. The results of this study showed that there was a positive relationship between perceived security and attitude toward online apparel mass-customization, moderated by

trust. In addition to that, there was a positive relationship between perceived usefulness of mass-customized jeans and attitude toward online apparel mass-customization.

Technology and Mass-customization

While some researchers focused on the consumers' attitude towards mass-customization, other researchers focused on how to effectively and successfully apply technology to the implementation of mass-customization. Bae and May-Plumlee (2005) examined technology used in textiles and apparel industry and listed some of the widely used technologies that enables mass-customization of apparel, which were: computer-aided design (CAD), computer-aided manufacturing (CAM), electronic data interchange (EDI), e-commerce. These technologies can be used in different types of mass-customization. For example, 3D body scanning is used in fit customization and CAD or CAM is used in design customization. Loker and Oh (2002) and Istook (2002) conducted studies on the effect of technology on the process mass customization and co-design process, and discovered that the improvement in technology such as body-scanning and CAD along with other business information technology could contribute to the success of mass customization. Pitta (1998) emphasized on the importance of the use of technology to get information from customers in mass-customization. He suggested that, through the use of technologies such as customer databases and interactive media, companies can learn more about their customers' needs and wants, and build customer relationships with the customers, which is crucial for mass-customization.

Technologies as functional requirements (e.g. CAD, CAM, EDI) are important not only because it enables accurate production and quick response to customers' wants and needs but also because it reflects the company's capability of performing mass-customization business which could increase consumers' trust toward the company (Chow & Holden, 1997; Wikstrom, 1996). Therefore, many researchers emphasized that the technological readiness and improvement are a necessity to achieve success in mass-customization (Broekhuizen & Alsem, 2002; Du et al., 2003; Swink & Hegarty, 1998).

Benefit Sought

Apparel as commodity that almost all the consumers purchase should be marketed towards specific segments of consumers because different consumers have different wants and needs (e.g. size, color, style, price, quality, convenience in shopping) (Mason & Ezell, 1993). Market segmentation is essential in developing differentiated marketing strategies in order to appeal to heterogeneous consumer groups which have different characteristics. Segmentation, as a way of selecting customers, is one of the first steps in developing target marketing strategies (Kotler & Armstrong, 2010). Market segmentation is originated from the economic theory that explains the relation between different pricing levels through segmentation and the level of profit. The profit is maximized when pricing levels are differed based on the segmentation (Frank, Massy & Wind 1972). Dibb and Simkin (1996) indicated that market segmentation is a resource-efficient way of serving diverse customers' wants and needs because through market segmentation, a marketer does not have to market everything to everyone in the market but efficiently market what will sell to a particular customer segment.

There are many segmentation bases such as demographics (e.g. age, gender, income, occupation), psychographics (e.g. lifestyle, Attitude/Interest/Opinion), benefit sought (e.g. convenience, economy, prestige), and socioculture (e.g. religion, social class, nationality) (Lindridge & Dibb, 2003, Peter & Olson, 2005). Among various segmentation bases, a common base used often by marketers is benefits sought. Benefits sought is defined as specific benefits consumers seek. In other words, they are the needs consumers want to be fulfilled (Schiffman & Kanuk, 1983). Benefit segmentation is performed by understanding consumer value systems and based on their different value systems on products.

Types of Benefits Sought

Researchers and marketers attempt to understand what different benefits consumers seek in purchasing products (Peter & Olson, 2005). Many researchers have identified the bases for benefit segmentation. Kim and Lee (2000) identified three segments of catalogue shoppers who have professional jobs through cluster analysis: convenience seekers, product seekers, and inactive shoppers. Convenience seekers sought convenience through catalogue shopping, and

they were likely to be married professionals with high self-confidence and fashion consciousness. Product seekers were also married professionals but they tended to show more interest in benefits that were related to product itself, such as product quality, product price, and variety in product assortment. Inactive shoppers were married male professionals who tended to shop apparel from catalogues the least. Compared with the convenience seekers, they had lower self-confidence and fashion consciousness. Hong and Koh (2002) identified three segments of consumers of female apparel in Korea. The three segments of consumers were brand-oriented, budget-oriented, and fashion oriented, and they perceived differently in the importance of store attributes (e.g. price/variety, discount policy, customer service/convenience). Carpenter, Moore and Fairhurst (2005) found that utilitarian benefit (e.g. finding exactly what a consumer wanted in a shopping trip) and hedonic benefit (e.g. feeling excitement from purchase experience) both have positive relationships with consumer satisfaction, store loyalty, and willingness to spread word-of-mouth among college students in apparel shopping. By using means-end chain, Botschen, Thelen, and Pieters (1999) investigated consumers' benefits sought in receiving service from sales persons while shopping apparel. Attributes related to sales personnel's service such as friendliness, competence, honesty, politeness, and empathy lead to desired benefits such as fun in shopping, finding the right clothing, and efficiency in shopping. Botschen et al. based on these findings, determined consumer segments; less demanding (for service) consumers and more demanding consumers.

Among many possible benefits sought, three types of benefit sought (i.e. uniqueness seeking, fit seeking, budget seeking are chosen in this proposed study and the literature related to these three types of benefit sought are reviewed in the following sections.

Uniqueness Seeking

Consumers may seek uniqueness in their clothing style for a certain level of non-conformity, in order not to look identical or similar to other people (Snyder & Fromkin, 1980). In apparel mass-customization, especially in design customization, consumers' level of uniqueness seeking may be an important benefit sought by the customers.

<u>Definition of Uniqueness</u>

Burns and Warren (1995) stated that an individual's need for uniqueness in external expression stems from social comparison process where individuals compare oneself to other people and self-perceive the degree of uniqueness relative to others. Tian et al. (2001) defined the consumer need for uniqueness as the pursuit of dissimilarity from established social norms through product and brand purchases. Consumers' need for uniqueness reflects individual's counter-conformity motivation and differentiates an individual from others by use and visual display of consumer goods. Tian et al. proposed three dimensions of uniqueness: creative choice counter-conformity, unpopular choice counter-conformity, and avoidance of similarity. Creative choice counter-conformity is an individual's unique choice of products and display of the product, which leads other people to believe that it is a good choice and the person who made the choice is unique. In showing creative choice counter-conformity, an individual strives to express his/her uniqueness and individuality through pursuing the goal of purchasing original and novel consumer goods. Different from creative choice counter-conformity, unpopular choice counter-conformity may lead to negatively distinguishing oneself from others. In pursuing unpopular choice counter-conformity, a consumer may risk social disapproval. Avoidance of similarity is another way of reestablishing one's appearance through expressing uniqueness. Avoidance of similarity refers to loss of interest in or discontinued use of those consumer goods that became popular in order to avoid conforming to norms that are commonplace.

<u>Theory of Uniqueness</u>

Uniqueness attributes are defined as characteristics that people manifest their differences within the range of social acceptance (Snyder & Fromkin, 1980). The theory of uniqueness explains how 'emotional and behavioral outcomes of interpersonal similarity depend on the magnitude of self-perceived similarity relative to the person(s) with whom we are comparing to ourselves.' (p.34). In other words, when people perceive high degree of similarity from another person, negative emotional responses would occur, which leads to the reestablishment of their differences. The perception of similarity, which may cause an individual to have negative emotions such as anxiety, is different from one individual to another. For example, a woman is wearing a black dress at a party and finds out that many other women are wearing similar style of black dress. She feels high level of similarity among the crowd and feels anxiety due to the

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similarity. The woman may go back home and get changed to a blue dress or may use the purple shawl she left in her car in order to reestablish her appearance so that she looks different from other women at the party.

Uniqueness is often expressed through consumer goods (e,g. clothing) and the visual display of those goods to other people. As shown in the above example, clothing is commodity that is used to express a person's uniqueness attributes. Snyder and Fromkin (1980) indicated that clothing is one of the consumer commodities that have signal value as a uniqueness attribute and that there is an intimate link between self-identity, clothing, and self-perceived uniqueness. Since clothing is a means of social interaction and symbolic communication tool, people often express their identity and their need for uniqueness through clothing. In this process, the signal value of clothing is delivered to other people through non-verbal communication (Damhorst, Miller-Spillman & Michelman, 2005).

Previous Studies in Uniqueness

Workman and Kidd (2000) applied the uniqueness theory and used an uniqueness scale developed by Fromkin and Lipshitz (1976) to characterize fashion consumers into fashion innovators, fashion opinion leaders, innovative communicators, and fashion followers. Among the four groups, the authors labeled the first three consumer groups as fashion change agents, who had higher need for uniqueness while fashion followers had lower need for uniqueness. Fashion change agents expressed highly negative emotions and showed behavioral change toward dissimilarity, which led the adoption of a newly introduced style and discarding of the current style. In other words, seeking uniqueness is what motivates fashion change agents to pursue different styles of clothing, accept new fashion styles, and propel the dissemination of new fashion.

Workman and Kidd's (2000) study showed that different degree of uniqueness-seeking could provide a base for segmenting and profiling apparel consumers. One of the consumer segments that needs a high level of uniqueness is market mavens. Market mavens are individuals who have information about many kinds of products, places to shop, and other facets of markets, and initiate discussions with consumers and respond to requests from consumers for market information (Feick & Price, 1987). However, different from opinion leaders, they do not necessarily influence purchasing behavior of other consumers. Clark and Goldsmith (2005)

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conducted a study on the psychological influences of market mavens and found that market mavens sought distinctive products and brands that other people may not use and expressed their uniqueness through the products that they purchase.

Simonson and Nowlis (2000) indicated that the need for uniqueness has a significant effect on consumers' decision making in purchase. The results of their study showed that the consumers who had high need for uniqueness were less responsive to marketing tactics including promotional strategies such as advertising puffery, were less likely to select compromise options, and were willing to take risk. In terms of consumers' mall shopping behavior, Burns and Warren (1995) found that consumers with higher need of uniqueness tended to shop more frequently at suburban shopping malls other than those located closer to their places of residence. In other words, consumers with higher need for uniqueness were more likely to make a trip to a farther shopping mall than consumers with lower need for uniqueness, in order to satisfy their needs for uniqueness. The result explained that regional shopping mall choice may be based on an individual's need for uniqueness

Measures of Uniqueness Seeking

The need for uniqueness scale was developed through measuring individual differences in need of uniqueness that stem from a motivation for differentiating oneself from others. Snyder and Fromkin (1977) developed Need for Uniqueness (NFU) Scale with 32 items including items such as 'I do not always need to live by the rules and standards of society', 'I would rather be known for always trying new ideas than for employing well-trusted methods'. The reliability of NFU scale was tested through test-retest reliability. The test-retest correlation (.68) turned out to be highly positive, and thus, the reliability of NFU scale was acceptable (Snyder & Fromkin, 1980). Fromkin and Lipshitz (1976) developed a uniqueness scale, which included 33 items, such as: 'I do not always need to live by the rules and standards of society.', 'I tend to express my opinions publicly, regardless of what others say.', and 'I like to go my own way instead of acting on approved rules.' The reliability of the scale was .82. Tian et al. (2001) developed a scale with 31 items measuring three types of uniqueness (i.e., creative choice counter-conformity, unpopular choice counter-conformity, avoidance of similarity). In this scale, 11 items were developed to measure the creative choice counter-conformity. One example is 'I actively seek to develop my personal uniqueness by buying special products or brands.' There were 12

items for measuring unpopular choice counter-conformity. An example was 'When dressing, I have sometimes dared to be different in ways that others are likely to disapprove.' For avoidance of similarity, eight items were included. One example was 'I avoid products or brands that have already been accepted and purchased by the average consumer.' The internal consistency reliability of the scale measured by Cronbach's alpha was .95.

Fit Seeking

Howarton and Lee (2010) found that consumers perceived fit as a major factor in purchasing apparel and apparel companies have their size and fit standards. The standards are determined by the firm's basic pattern blocks, which are used for product development such as style and pattern development. Based on the basic pattern blocks, clothing of various sizes is produced by applying grading rules which establish increase and decrease of the pattern blocks (Glock & Kunz, 2000). Many consumers have difficulty in finding a garment that fits because different apparel companies use different sizing system, leading to consumers' confusion in purchasing clothes (Kinley, 2003; Pisut & Connell, 2007; Workman & Lentz, 2000) but they have a tendency to avoid purchasing ready-to-wear apparel that needs alteration (Howarton & Lee). A good example of this fitting and sizing chaos is vanity sizing. With the vanity sizing, a woman who normally wears Misses size 8 fits in size 2 clothing. The woman may feel good about herself because she is purchasing size 2 instead of size 8. Because this strategy has been successful, many companies such as Chico's use the vanity sizing to attract consumers (Cassutt, 2008).

Previous Studies in Apparel Fit

Apparel researchers have investigated consumers' problems in fit. Pisut and Connell (2007) investigated fit problems of U.S female consumers whose age ranges between 19 and 54. The authors found that most common fit problems were in tightness and length. Many participants had fit problems at waist, hip, and bust. Overall, mature female consumers in the U.S. preferred semi-fit followed by loose fit. Alexander et al. (2005) investigated the clothing fit of young female adult consumers whose age ranges between 18 and 28. Results showed that 61% of the participants had to do alteration on ready-to-wear apparel to obtain a better fit. Close to 50% of the participants in this study reported that they were unsatisfactory with the fit of ready-

to-wear apparel. However, inconsistent results were found in the study of Ashdown and O'Connell (2006). The authors investigated the fit perception of 16 mature women whose age ranged from 52 to 63 and size fell in Misses' size 12 to 14. The participants of this study were satisfied with the fit of the test jacket and did not have high expectation on perfect fit.

Measures of Fit seeking

Instead of directly measuring the degree of desire for seeking an apparel product that fits, researchers in previous studies usually measured consumers' awareness in fit problem or fit satisfaction (De Klerk & Tselepis, 2007; Pisut & Connell, 2007). Pisut and Connell developed a self-administered questionnaire to measure perceived problem in fit based on the results of focus group discussions. The scale consists of two parts, location and reason for problems. Participants are asked to check 'yes' or 'no' to indicate if they have a fit problem in a certain body location. If their answer is 'yes,' they are asked to select possible reasons from a list. For example, if a participant has fit problem in the bust area, she will check the box next to 'yes', and then choose the reasons from tight, loose, high, and low. If she does not have any problem with upper arm area, then she checks in the box next to 'no', and there is no need for her to choose any reason from the list.

Deal Seeking

Holbrook (1999) stated that the consumers' price perception starts from the comparison between what they can receive (i.e. product) and what they give (i.e. money). Klein and Oglethorpe (1987) used the Transaction Utility Theory by Thaler (1985) to explain consumers' behavior related to price. Thaler posited that the actual purchase price of a good is a function of consumers' internal reference price for the product. In other words, consumers' internal reference price is used for purchase decision making by consumers comparing their internal reference price to market price. Klein and Oglethorpe (1987) listed three types of reference prices (i.e., aspiration prices, market prices, historical prices). To describe the concept of aspiration prices, the authors used phrases such as 'the prices I would like to pay', 'the prices I would consider a good buy', 'the most I would ever pay', and 'a reasonable price'. Market price was specified as 'the average retail price' or 'a particular price I'd seen or heard'. Lastly, historical prices were

'the average price I pay', 'the last price I paid', or 'the price I usually pay'. All three types of prices may influence the price that consumers are willing to pay.

Lichtenstein, Ridgway, and Netemeyer (1993) included seven price perception constructs in their study. They were (a) value consciousness, defined as 'a concern for price paid relative to quality received' (p. 235), (b) price consciousness, defined as 'the degree to which the consumer focuses exclusively on paying low prices' (p. 235), (c) coupon proneness defined as 'an increased propensity to respond to a purchase offer because the coupon form of the purchase offer positively affects purchase evaluations' (p. 235), (d) sale proneness, defined as 'an increased propensity to respond to a purchase offer because the sale form in which the price is presented positively affects purchase evaluations' (p. 235), (e) price mavenism, defined as 'the degree to which an individual is a source for price information for many kinds of products and places to shop for the lowest prices, initiates discussions with consumers, and responds to requests form consumers for marketplace price information' (p. 235), (f) price-quality schema, defined as 'the generalized belief across products categories that the level of the price cue is related positively to the quality level of the product' (p. 236) , and (g) prestige sensitivity, defined as 'favorable perceptions of the price cue based on feelings of prominence and status that higher prices signal to other people about the purchaser' (p. 236). Among the seven price perception constructs, five of them were assigned to be negative role of price. They were value consciousness, price consciousness, coupon proneness, sale proneness, and price mavenism. If consumers have a high degree of these perceptions, they were not willing to pay a high price for a product. Price-quality schema and prestige sensitivity were positive role of price. If consumers have a high degree of these perceptions, they are more likely to pay a high price.

Some consumers may focus on seeking deals when purchasing apparel. Arnould et al. (2002) called the characteristic of consumers who desire to get a good bargain as deal proneness. The deal proneness was viewed as a consumer personality variable and the deal-prone consumers tended to seek bargain for many reasons including saving money, having fun finding deals, and being efficient shoppers. Among many dimensions of price suggested by Lichtenstein et al. (1993), price consciousness and sale proneness may be the closest to the behavior of deal seeking. Consumers who seek deal focus primarily on paying low prices and they have an increased propensity to respond to a purchase offer when the product is on sale because price positively affects their purchase evaluations.

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Using price consciousness and sale proneness among Lichtenstein et al.'s (1993) price dimensions, Alford and Biswas (2002) conducted a study to investigate how consumers' price perceptions influence purchase intentions. They reported that consumers' level of sale proneness influenced perceived offer value, search intention, and purchase intention in purchasing running shoes. Highly sale-prone consumers reported higher perceptions of offered value and higher buying intention. In other words, highly sale-prone consumers perceived offered sale or discount well and were more willing to purchase items on sale. They were also more willing to search for a better price than consumers who were less sale-prone. Wagner's (2007) conducted 40 in-depth interviews with apparel shoppers and showed that desirable prices led to shopping pleasure for consumers, suggesting that deal seeking is motivated by enjoyment. However, inconsistent with Wagner's finding, Jin, Sternquist, and Koh (2003) reported no significant relationship between sale proneness or value consciousness and hedonic shopping experience. The authors suggested that the respondents who seek deals in apparel shopping might perceive the shopping experience more of a chore than pleasure.

Hiu, Siu, Wang, and Chang (2001) identified a consumer segment cluster that was consist of those people whose price-consciousness was a major decision making factor in purchasing fashion goods. The consumers in this segment were price-conscious who were deal seekers who took time to shop, who watched how much money they spent, and who sought best value for the money. Several studies found that consumers' perceived value was different in various channels of distribution. In the study of Paulin and Geistfeld (2003), large proportion of the respondents (76-94%) perceived that discount stores and department stores carried reasonably priced apparel but only moderate proportion of the respondents (51-75%) considered that specialty stores had reasonable prices. Carpenter (2008) also found that value was one of the significant motives to shop apparel at supercenter (i.e. discount store) while brand was not an important one. Consistently, Moore and Carpenter (2008) found that consumers related different price cues to different channels of distribution. Consumers with higher quality consciousness and prestige sensitivity were more likely to choose traditional department stores (e.g. Macy's). Consumers with higher price sensitivity and quality consciousness but lower prestige sensitivity were more likely to choose both value department stores (e.g. JCPenney, Kohls) and discount stores (e.g. Target). Consumers who choose off-price retailers (e.g. TJ Maxx) had higher price sensitivity.

Martinez and Montaner (2008) used two questions to measure price consciousness including 'I find myself checking the prices even for small items.' and 'I compare the prices of at least a few brands before I choose one.' Jin et al. (2003) developed multidimensional price cues in order to measure consumers' shopping behavior in terms of price. The constructs in this scale included price-quality schema, prestige sensitivity, sale proneness, and price mavenism. The price-quality schema questions included three questions: 'Generally speaking, the higher the price of a product, the higher the quality.', 'The price of a product is a goof indicator of its quality.', and 'You always have to pay a bit more for the best.' Four questions were used to measure prestige sensitivity. One question, for example, was 'Buying a high priced brand makes me feel food about myself". In regards to sale proneness, there were two questions: 'I am more likely to buy brands on sale' and 'Compared to most people, I am more likely to buy brands that are on special'. Three questions were included in the dimension of price mavenism. One question, for example, was 'People ask me for information about prices for different types of products'. The reliability was measured by Cronbach's alpha. For the questions related to price-quality schema and prestige sensitivity, Cronbach's alpha was both 0.92. For sale proneness, it was 0.84, and for price mavenism, it was 0.94. The validity of the questionnaire was measured by confirmatory factor analysis (CFA) and the authors reported that all factor loadings were significant at $p<0.001$.

Innovativeness

In this study, the role of innovators and early adopters are considered important in adopting mass-customization. Innovators' initiation of the product use and early adopters' encouragement of purchase will be necessary in the adoption of mass-customization of apparel. Therefore, literatures related to innovativeness are reviewed in this section.

Definition of Innovation and Innovativeness

Innovation is 'an idea, practice, or object that is perceived as new by an individual or other unit of adoption' (Rogers, 1995, p.11). Hoyer and McInnis (1997) considered the role of

consumers in the market place and defined innovation as 'a product, service, attribute, or idea that is perceived as new by consumers within a market segment and that has an effect on existing consumption patterns' (p. 469). Arnould et al. (2002) defined innovation as 'new things and ideas and new ways of behaving and interacting with things' (p. 573). Innovativeness is usually used to describe an individual's characteristic. Midgely and Dowling (1978) defined innovativeness as 'the degree to which an individual is receptive to new ideas' (p.236). Consumer innovativeness is an important force that leads to innovative behavior (Roerich, 2004). Midgely and Dowling (1978) indicated that consumers with a high degree of innovativeness make innovation adoption decisions independently without the communicated experience of others while the communicated experience of others played a bigger role in non-innovators' decision of innovation adoption.

Diffusion of Innovation Theory

Rogers first introduced the diffusion of innovation theory in 1962 to explain how an innovation is adopted by consumers and how the diffusion of innovation occurs. The diffusion of innovation theory suggests that when a new idea or product is created, it becomes used by people through the process of diffusion. Diffusion is 'the process by which an innovation is communicated through certain channels (e.g., word of mouth, media) over time among the members of a social system' (Rogers, 1995, p. 10). The author classified adopters in five categories (i.e., innovators, early adopters, early majority, late majority, laggards) based on how soon the members of the social system adopt innovation. Innovators actively seek new information about products or new ideas and they are willing to take risk in the process of adopting innovation. Therefore, innovators are the first ones to adopt innovative products or ideas. Once innovation is adopted by innovators, it diffuses into early adopters, early majority, late majority, and laggards, in order. Innovators accounts for approximately 2.5% of the population. Early adopters have the highest degree of opinion leadership, and therefore, potential adopters look for information about the innovation from early adopters. Early adopters are not as far ahead as innovators from average individuals in terms of innovativeness. Early adopters accounts for approximately 13.5% of the population. Early majority adopt innovation just before average individuals. They are deliberate before completely adopting the innovation. Individuals that are in the late majority category are rather skeptical about adopting the innovation. They do

not adopt innovation until they see majority of the members in their society uses the innovation. Early majority accounts for 34% of the population. Late majority which accounts for another 34% of the population are also relatively scarce in resource (i.e. have less money) than the three adopter categories ahead of them. Laggards are the last ones to adopt innovation. Laggards take longer time to adopt innovation because they tend to make sure that the particular innovation does not fail. They are extremely cautious. Laggards are 16% of the population.

Perceived attributes of innovation (e.g. relative advantage, compatibility, complexity) may affect the rate of adoption (Rogers, 1995). Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. It can be measured in economic terms. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Other elements of innovation that explain the rate of adoption include triability, observability, perceived risk, and price (Onkvisit & Shaw, 1994). The above attributes are critical product characteristics influencing product adoption.

Onkvisit and Shaw (1994), adding the aspect of marketing activities in the diffusion process, stated that 'diffusion of innovation involves the adoption over time of new products or services by adopting units within social systems in a given culture as stimulated by marketing activities' (p. 440). The authors proposed five consecutive steps (i.e., knowledge, persuasion, decision, implementation, confirmation) in the innovation decision process. An individual attains knowledge by recognizing the existence of an innovation and learning how the innovation functions to a degree. Persuasion occurs when an individual forms either favorable or unfavorable attitude toward the innovation. After the persuasion stage, an individual makes a decision whether he/she will adopt the innovation or reject it. When the innovation is used by an individual, it reaches the implementation stage. In confirmation stage, the individual who adopted the innovation seeks reinforcement, but may reverse the previous innovation-decision, which means he/she may no longer use the innovation.

Hoyer and McInnis (1997) differentiated the innovation decision process by consumers' effort in adopting the innovation. The high-effort hierarchy of effects occurs in the order of awareness, information collection/search, attitude formation, trial, and adoption. In higher-effort hierarchy of effects, consumers think that the innovation involves more psychological, social,

and economic risk. The authors gave an example, indicating that purchasing of a new style of clothing could be considered as high-effort hierarchy of effects. Different from the high-effort hierarchy of effects, the low-effort hierarchy of effects does not include the stage of information collection/search because the low-effort hierarchy of effects does not require as much of consumers' knowledge or involvement, and the use of innovation has less risk as those products adopted through the high-effort hierarchy of effects. For example, purchasing an improved quality paper kitchen towel may be considered as low-effort hierarchy of effects.

Types of Innovation

Hoyer and McInnis (1997) proposed three types of innovations based on the level of behavioral change required (i.e., discontinuous innovation, dynamically continuous innovation, continuous innovation). Discontinuous innovation occurs when the perceived innovativeness of a product is high, and thus, it requires highest consumer behavioral change. For example, when television (TV) was first invented, it was very new to consumers and consumers had to learn how to use TV from scratch. A dynamically continuous innovation does not require as much consumer behavioral change as discontinuous innovation. For example, when remote-controlled TV was developed, consumers already knew how to use non-remote-controlled TV. They did not have to learn from the beginning how to use TV but had to learn how to use remote control. A continuous innovation occurs when the innovation causes limited consumer behavioral change. A consumer does not have to make significant amount of effort to use the innovative product or adopt innovative idea. For example, a consumer does not have to learn to use high-definition TV because using high-definition TV is not much different from using remote-controlled TV (Onkvisit & Shaw, 1994).

In addition to the three types of innovation categorized based on the level of consumer behavioral change, Hoyer and McInnis (1997) also identified another three types of innovation (i.e. functional innovation, aesthetic or hedonic innovation, symbolic innovation). Functional innovation occurs when an innovation provides better functional benefits to consumers than the existing alternatives. Wireless Internet service provides functional benefit of enabling consumers to be connected to the Internet without wired Internet connection. Aesthetic or hedonic innovation occurs when consumers perceive newness in products, services, or ideas that appeal

to their aesthetic needs, pleasure seeking, or sensory needs. New style of clothing and fragrance-filled jewelry can be considered to be aesthetic or hedonic innovation. Symbolic innovation entails social meanings. Symbolic innovation occurs when a particular group of society uses innovation to convey the meaning of group membership. New and prestigious style of clothing item only used by upper-class of the society is an example of symbolic innovation.

<div align="center">Types of Innovativeness</div>

Consumers' intention in adopting mass-customization of apparel may be involved in two aspects of innovativeness, fashion innovativeness and technological innovativeness. These two types of innovativeness are discussed in the following sections.

Fashion Innovativeness

Fashion innovativeness may be defined as one's attribute that pursues fashion style that is perceived as new. An individual with high level of fashion innovativeness would have a higher degree of willingness to try new styles of apparel products. Goldsmith, Heitmeyer, and Freiden (1991) defined fashion innovator or fashion leader as a consumer who has a greater than average interest in fashion, who purchases new fashions relatively earlier than the rest of the market, and who influences later buyers to purchase new fashion items. Martinez and Polo (1996) indicated that fashion innovators influenced the behavior of later buyers by wearing new fashions for others to see and by spreading word-of-mouth about them.

Previous Research on Fashion Innovativeness

One of the motivations behind adoption and diffusion of new fashion style is the need of differentiation (Workman & Johnson, 1993). Evans (1989) also indicated that consumers are motivated to focus on newness for the expression of the self. Sproles and Burns (1994) applied the uniqueness theory to explain the reason why fashion innovators adopt new styles. They suggested that adopting new fashion was a symbol of exclusiveness and differentiation from their social inferiors. The study results from Workman and Kidd (2000) supported Sproles and Burns' proposition, indicating that fashion innovators pursue more uniqueness than the followers do. The authors found that depending on an individual's need for uniqueness, perceived similarity

would lead to either positive or negative emotions and to behavioral change or no change. When fashion innovators perceived their similarity to a comparison group to be high, negative emotions and behavioral change toward dissimilarity would result in adoption of a newly introduced style. When fashion followers perceived their similarity to a comparison group to be high, positive emotions and little or no behavioral change occurred and it led to the continuation of the current style.

Many studies have examined the characteristics of fashion innovators. Onkvisit and Shaw (1994) provided a comprehensive description of the characteristics of innovators who can be referred to fashion leaders regarding apparel industry. Innovators were venturesome and had above average status and income. Innovators primarily depended on impersonal sources of information (e.g., TV commercials, magazines, posters) when making purchase decisions and are socially mobile, financially privileged, and cosmopolitan individuals. Goldsmith (2000) supported Onkvisit and Shaw's (1994) proposition by finding that the heavy users like fashion innovators sought out more product-related information from magazines, newspapers, and TV. Innovators were less interested in price but rather appeared to be more interested in product benefits (e.g. looking slim, looking fashionable, pursuing higher social status). They were more willing to take social risk associated with being the first to adopt a new style (Kaiser, 1997). Goldsmith, Freiden, & Kilsheimer (1993) and Goldsmith, Flynn and Moore (1996) found that the female fashion innovators rated themselves much more dominating than submissive fashion followers. Fashion innovators described themselves as more excitable, indulgent, contemporary, formal, colorful, and vain than the followers. Goldsmith et al. (1999) reported that the female fashion innovators had unique self-images. Fashion innovators were more likely to report that they acted as fashion opinion leaders, were more involved with new fashions, and shopped more and spent more for clothing, than fashion followers. Fashion innovators were self-reported to be more delicate, comfortable, dominating, indulgent, contemporary, unorganized, irrational, youthful and colorful. They were also more self-confident than fashion followers (Belleau, Nowlin, Summer & Xu, 2001) and were more knowledgeable about fashion products than fashion followers (Goldsmith et al, 1996). On this note, Goldsmith (2000) found that knowledge about apparel products was highly correlated with consumer innovativeness.

<u>Measures of Fashion Innovativeness</u>

Hirschman (1980) developed a fashion innovative scale with two dimensions (i.e., fashion innovativeness, fashion opinion leadership). The questions operationalizing fashion innovativeness included three items. 'Are you willing to try new ideas about clothing fashions? How often?', 'Do you try something new in the next season's fashions? How often?', and 'Are you usually among the last to try new clothing fashions? How often?'. The questions developed in order to measure fashion opinion leadership included three items. 'How often do you influence the types of clothing fashions your friends buy?', 'How often do others turn to you for advice on fashion and clothing?', and 'How many of your friends and neighbors regard you as a good source of advice on clothing fashions?' The reliability of the scale was not reported. The most commonly used scale to measure innovativeness is Domain Specific Innovativeness (DSI) scale, developed by Goldsmith and Hofacker (1991). DSI measured frequency of clothes shopping, frequency of clothes purchasing, watching fashion shows on television, fashion magazine readership, fashion awareness, and opinion leadership. The scale was proven to be reliable by having coefficient-alpha of .82. Park, Burns, and Rabolt (2007) developed apparel specific measures fashion innovativeness, based on the Domain Specific Innovativeness measure developed by Goldsmith and Hofacker (1991). There were a total of six items measuring the fashion innovativeness. The questions included the following: 'In general, I am the last in my circle of friends to know the names of the latest new fashions' (Intended for reverse coding), 'In general, I am among the last in my circle of friends to buy a new fashion item when it appears'(Intended for reverse coding), and 'Compared to my friends, I own few new fashion items' (Intended for reverse coding). The reliability of Park et al.'s (2007) fashion innovativeness measure was tested by calculating Cronbach's alpha and it was 0.79. Chen-Yu (1995) used a total of 18 questions in asking pre-purchase attitude toward sweatshirts. Among the 18 questions, three questions were measuring the attitude toward sweatshirt in terms of fashion consciousness. The questions included: "I enjoy knowing fashion trends of sweatshirts," "When buying sweatshirts, I consider myself to be fashion/style conscious" and "I always wear sweatshirts compatible with the current fashion."

Technology Innovativeness

In the context of technology, innovativeness is the willingness of an individual to try new technology (Robinson, Marshall, & Stamps, 2004). Crespo and Del Bosque (2008) found that consumers' technology innovativeness such as innovativeness specific to the Internet had significant positive relationship with attitude toward the adoption of new technology such as B2C e-commerce. Technology innovativeness is also an important consumer characteristic that is needed in adopting mass-customized products because mass-customization process often occurs through the use of technology (e.g. Internet, Computer-Aided Design, Digital Printing) (Goldsmith & Freiden, 2004).

Davis (1989) developed the Technology Acceptance Model to predict the intention of acceptance and use of new technology. The Technology Acceptance Model was developed based on the Theory of Planned Behavior, and the Theory of Planned Behavior was developed through refining and expanding the Theory of Reasoned Action. To understand the Technology Acceptance Model, the Theory of Reasoned Action and the Theory of Planned Behavior are introduced first, and then, the Technology Acceptance Model is discussed in the following sections.

Theory of Reasoned Action

Theory of Reasoned Action was developed by Fishbein and Ajzen (1975). The premise of the theory is that by understanding consumers' beliefs and attitude, it is possible to understand their behavior and intention. Based on the Theory of Reasoned Action, a person's beliefs are reflected on his/her attitude toward an object. The attitude along with subjective norm affects the person's behavioral intention, and in turn, affects the person's behavior. Four main elements are included in this theory. The first element is a person's beliefs and attitude toward an object. Fishbein and Ajzen stated that belief represents the information a person has about the object and associates, and attitude was defined as 'a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object' (p. 6). Attitude has an affective nature which can be evaluated.

In measuring attitude, Fishbein and Ajzen (1975) suggested that participant's self-rating for the liking for the object (e.g. like-dislike) or for the favorability for a given object (e.g. favorable-unfavorable) can be used to evaluate attitude in most circumstance, but they also

proposed a formula to measure attitude, that is, the sum of one's strength of the belief multiplied by the evaluation of the belief. The strength of the belief is the perceived probability of association between an object and its relevant attributes. An example of a measure of belief strength is using a five-point Likert scale to measure 'How likely is it that the product of the Gap is durable.' The evaluation of the belief reflects how favorably or important the consumer perceives that attribute. An example of a measure of belief evolution is using a Likert type scale to measure durability, where -2 is unfavorable and +2 is favorable. In the study of Kim and Forsythe (2008), studying consumers' willingness to adopt virtual try-on technology, attitude was measured in a seven-point Liker type scale where the left end of the scale was -3 and the right end of the scale was +3. There were four items to measure attitude toward using virtual try-on. The questions were (a) 'Using virtual try-on feature is a bad/good idea', (b) 'Using virtual try-on feature is inferior/superior', (c) 'Using virtual try-on feature is unpleasant/pleasant', and (d) 'Using virtual try-on feature is unappealing/appealing'. The intension of using the virtual try-on function was also measured by a seven-point Likert type scale where the left end of the scale was strongly disagree and the right end was strongly agree. There were two items including 'I use virtual try-on feature (when available) for purchasing apparel online' and 'I use virtual try-on feature (when available) for browsing for apparel shopping online'. The authors reported that both attitudes and intention of use measures were reliable, Cronbach's alpha for all the measures being greater than 0.8.

The second element in the Theory of Reasoned Action is subjective norm. Subjective norm is specific individual's or group's thought on whether a person should perform the behavior (Ajzen, 1988). Subjective norm such as peer group pressure is important in decision making in some consumer groups such as adolescents. De Klerk and Tselepis (2007) found that peer group opinion and the feeling of fitting in the social group are important factors in forming pre-purchase expectations, evaluations of garment fit, and thus post-purchase satisfaction, among early adolescent females. However, for other consumers groups such as young adults, subjective norm can be less of an influence in their purchase decision making. Chang, Burns, and Noel (1996) used the Theory of Reasoned Action to investigate the influence of attitudinal component and normative component (i.e. subjective norms) in brand-name casual apparel among college students. They found that attitudinal component was more important determinant in forming purchase intention for brand-name casual apparel than the normative component.

The third element is behavior intention. Behavioral intention was defined as 'a person's intentions to perform various behaviors' (Fishbein & Ajzen, 1975, p.12). The strength of behavioral intention is indicated by the person's subjective probability and is measurable. Based on the Theory of Reasoned Action, behavior intention is measured by adding attitude toward behavior and subjective norm.

The fourth element is behavior. Behavior is defined as 'a person's observable response when studied in its own right' (Fishbein & Ajzen, 1975, p. 13). Behavior and behavioral intention are different in that behavior is observable while behavioral intention is not. Behavioral intentions vary in strength (Peter & Olson, 2005). In other words, it is possible that a consumer who had behavioral intention may not conduct the behavior. However, based on the Theory of Reasoned Action (Fishbein & Ajzen, 1975), measuring behavioral intention is the closest way of predicting the behavior (Arnould et al., 2002; Davis, Bagozzi & Warshaw, 1989; Hoyer & MacInnis, 1997).

Theory of Planned Behavior

Based on the Theory of Reasoned Action, a person's beliefs are reflected on his/her attitude toward an object. The attitude along with subjective norm affects the person's behavioral intention and, in turn, behavior. Ajzen (1988) added a variable, perceived behavioral control, to the Theory of Reasoned Action developed by Fishbein and Ajzen (1975) and named it the Theory of Planned Behavior. Therefore, in the Theory of Planned Behavior, in addition to attitude and subjective norm, perceived behavioral control is also a factor that affects behavioral intention and behavior.

Perceived behavioral control refers to 'people's perception of the ease or difficulty of performing the behavior of interest' (Ajzen, 1991, p. 183). Perceived behavioral control is the sum of each controlled belief multiplied by the perceived power of the particular control factor to facilitate or inhibit performance of the behavior. Researchers have suggested several controlled beliefs. Taylor and Todd (1995) indicate that perceived behavioral control reflects beliefs regarding access to the resources and opportunities needed to perform a behavior. They proposed two components in perceived behavioral control, facilitating conditions and self-efficacy. Adopting Triandis' (1979) definition of facilitating conditions, the authors specified the resources as time, money, and other resources needed to actually perform the behavior. To measure

facilitating conditions, Taylor and Todd (1995) used 10 items such as 'Having time and money to buy a product is: (unimportant/important)' and 'I have the time and money needed to buy a product: (unlikely/ likely)'. The term self-efficacy was first used by Bandura (1977) and Taylor and Todd (1995) define self-efficacy as 'an individual's self-confidence in his/her ability to perform a behavior' (p. 139). To measure self-efficacy, the authors used eight items such as 'I would be able to use the product even if there is no one around to tell me how to use it' and 'Being comfortable buying a product on my own is: (unimportant/important)'.

Some researchers used the Theory of Planned Behavior in order to understand consumers' willingness to do online shopping. The findings of Chih-Chung and Chang (2005) and Hansen's (2008) studies supported that all three elements in the Theory of Planned Behavior (i.e., attitude, subjective norm, perceived behavioral control) were useful to predict consumer online shopping intention. Wang, Chen, Chang, & Yang (2007) found that among the three variables, the perceived behavioral control of the participants had the most significant influence on their online shopping behavior, stronger than consumer attitude towards online shopping. Subjective norm did not have any significant influence on the consumer online shopping intention. These results provide a reason why the Theory of Planned Behavior may better predict consumer behavioral intention than the Theory of Reasoned Action, which does not have the perceived behavioral control element.

Technology Acceptance Model

Davis (1986) proposed the Technology Acceptance Model by modifying the Theory of Reasoned Action. Technology Acceptance Model is specifically useful in measuring the intention of adopting new technology. Davis (1989) proposed that perceived usefulness and perceived ease of use influence attitude toward the object (i.e., technology), which in turn affects intention of acceptance and the actual usage of the technology. Davis et al. (1989) defined perceived usefulness as 'the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context' and also defined perceived ease of use as 'the degree to which the prospective user expects the target system to be free of effort' (p. 985). Subjective Norm in the Theory of Reasoned Action was removed in the Technology Acceptance Model because it was not considered as a determinant of behavioral intention (Davis, 1989; Davis, et al., 1989).

Davis et al. (1989) used WriteOne, a word processing program as the new technology and 107 full-time MBA students in University of Michigan as participants to examine the Technology Acceptance Model. The results supported the model, showing that both perceived usefulness and perceived ease of use influenced the attitude toward new technology and intention to adopt the technology. Parveen and Sulaiman (2008) also used Technology Acceptance Model to examine the relationship between technology innovativeness and perceived usefulness and the relationship between technology innovativeness and perceived ease of use. The study results indicated that consumers' technology innovativeness had positive relationship with both perceived usefulness and perceived ease of use in using the Internet through mobile device. Chau (1996) conducted a study related to accepting computer-related technology based on the Technology Acceptance Model and consistently found that perceived usefulness directly affected the intention to use technology. However, no significant direct relationship existed between the perceived ease of use and the intention to use the technology.

In apparel sector, Kim and Forsythe (2008) expanded the Technology Acceptance Model by adding consumers' technology innovativeness and technology anxiety in apparel online shopping. The expanded version of the Technology Acceptance Model better predicted consumers' willingness to adopt virtual try-on technology. The study indicated that consumers' innovativeness in using the new virtual try-on technology positively influenced their attitude toward apparel online shopping and increased their intention to purchase apparel products online. Kim, Ma, and Park (2009) also used the Technology Acceptance Model to investigate the likelihood of US consumers adopting mobile technology as an innovative technology used for purchasing fashion goods. The authors found that both perceived usefulness and perceived ease of use were predictors of attitude toward mobile communication and mobile commerce, and furthermore, mobile technology use intention for shopping fashion goods. Cho and Fiorito (2009) investigated consumers' acceptance of online customization for apparel shopping, using and extending the Technology Acceptance Model. The authors added perceived security and trust to the original Technology Acceptance Model. The authors found that a significant relationship between perceived usefulness and attitude toward online apparel customization but the relationship between perceived ease of use and attitude toward online apparel customization was not statistically significant.

Measures of Technology Innovativeness

Davis (1989) developed measurement for perceived ease of use and perceived usefulness, and each one included six items. The six items to measure perceived usefulness included question such as 'Using Chart-Master in my job would make it easier to do my job'. One of the six items in measuring perceived ease of use was 'I would find Chart-Master to be flexible to interact with'. Later, in the study of Davis et al. (1989), using WriteOne, a word processing program as the new technology, the authors shortened the scales, including four items to measure perceived usefulness and perceived ease of use. The four perceived usefulness items were (a) 'Using WriteOne would improve my performance in the MBA program', (b) 'Using WriteOne would improve my productivity', (c) 'Using WriteOne would enhance my effectiveness in the MBA program', and (d) 'I would find WriteOne useful in the MBA program'. The four perceived ease of use items were: (a) 'Learning to operate WriteOne would be easy for me', (b) 'I would find it easy to get WriteOne to do what I want it to do', (c) 'It would be easy for me to become skillful at using WriteOne', and (d) 'I would find WriteOne easy to use'. In the measures developed by Davis (1989) and Davis et al. (1989), a seven-point Liker type scale was used. Chin, Johnson, and Schwarz (2008) decomposed and changed the scale to a dichotomous scale (e.g., 'very usable/very cumbersome'). The Cronbach's alpha value indicated that the reliability of the dichotomous scales was very high (0.93 for perceived usefulness, 0.94 for perceived ease of use). One of the contributions of the revised scale was to reduce the survey completion time.

Moore and Benbasat (1991) developed an instrument to measure relative advantage (i.e., similar to perceived usefulness) and ease of use based on Davis' (1986) instrument. The final instrument included five items to measure relative advantage. They were: (a) 'Using a PWS enables me to accomplish tasks more quickly', (b) 'Using a PWS improves the quality of work I do', (c) 'Using a PWS makes it easier to do my job', (d) 'Using a PWS enhances my effectiveness on the job', and (e) 'Using a PWS gives me greater control over my work'. Four items were included in the measure of ease of use. They are: (a) 'My interaction with   a PWS is clear and understandable', (b) 'I believe that it is easy to get a PWS to do what I want it to do', (c) 'Overall, I believe that a PWS is easy to use', and (d) 'Learning to operate a PWS is easy for me'. Cronbach's alpha values for relative advantage and ease of use were 0.95 and 0.81, respectively.

Kim and Forsythe (2008) used three questions to measure consumers' technology innovativeness in order to understand consumers' willingness to try new technologies such as Virtual Try-on. The three questions were as following: 'If I heard about new technology, I would look for ways to experiment with it', 'Among my peers, I am usually the first to try out new technologies' and 'I like to experiment with new technologies'. The calculated Cronbach's alpha of the measure was greater than 0.8. In the study of Park et al. (2007), internet innovativeness was measured as well as fashion innovativeness. There were a total of six items measuring consumers' internet innovativeness. The questions were such as 'In general, I am the last in my circle of friends to know any new retail web sites'. The Cronbach's alpha for the six items was 0.76.

Summary of Review of Literature

Mass-customization is defined as 'a business paradigm that creates variety and customization through flexibility and quick responsiveness' (Pine II, 1993, p.44). Mass-customization can provide consumers the products that they exactly want (Tseng & Jiao, 2001). To determine whether mass-customized products should be offered, a company should consider whether its customers demand products that need to meet their specific requirements or desires and whether the demanded product can be manufactured at prices that its customers can afford to pay. (Pine II, 1993). In implementing mass-customization, besides the Internet, latest technologies, such as CAD, CAM, 3D body scanning, and 3D pattern making technology play an important role (Apeagyei & Otieno, 2007; Bae & May-Plumlee, 2005; Broekhuizen & Alsem, 2002; Du et al.,2003; Istook, 2002; Loker & Oh, 2002). In order for a business to achieve success in mass-customization, the company needs to have flexibility, responsiveness, cost reduction, and quality (Anderson, 1997) while on the consumers' end, consumers' perceived benefits must be higher than perceived costs (Broekhuizen & Alsem , 2002). There were many ways to categorize the types of mass-customization. While Duray's (2004) four archetypes of mass-customization included fabricators, involvers, modularizers, assemblers, Burns and Bryant (2005) categorized apparel-specific mass-customization into design customization, fit customization, and personalization. Previous research showed consumers had relatively positive attitude towards mass-customized products (Choy & Loker, 2004; Goldsmith & Freiden, 2004)

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and willingness to involve in co-design process (Kamali & Loker, 2002; Lee et al., 2002). There was limited research related to the factors that influence consumers' attitude towards mass-customization of apparel. Cho and Fiorito (2009) investigated the customer attitude toward online mass-customization of apparel and found that perceived security, trust for the website, and perceived usefulness were positively related to the attitude toward online apparel mass-customization.

In the review of literature related to benefits sought, the concept of benefits sought was first reviewed. Because consumers have different wants and needs, marketers and researchers try to segment the consumers through market segmentation in order to identify the exact target customer segment and to better cater to them (Mason & Ezell, 1993; Peter & Olson, 2005). There may be many ways of segmenting but benefit segmentation allows marketers and researchers to identify what benefits consumers want to seek through purchasing products. The bases for benefit segmentation varies depending on the type of product (Hong & Koh, 2002), the channel of distribution (Kim & Lee, 2000), and whether a consumer wants utilitarian benefit or hedonic benefit in a shopping trip (Carpenter & Fairhurst, 2005).

Among many benefits consumers may seek, uniqueness seeking, fit seeking, and deal seeking were chosen and literature related to these three benefits sought were reviewed. Consumers may seek uniqueness in their clothing style for a certain level of non-conformity, in order not to look identical or similar to other people (Snyder & Fromkin, 1980). On the same note, Tian et al. (2001) defined the consumer need for uniqueness as the pursuit of dissimilarity from established social norms through product and brand purchases. In Snyder and Fromkin's (1980) Uniqueness Theory, the authors explained that clothing is one of the commodity that has signal value and thus clothing can be used to express one's uniqueness. In addition Simonson and Nowlis (2000) indicated that the need for uniqueness plays an important role in consumer decision making, and thus, the level of uniqueness seeking can be a base for consumer segmentation (Workman & Kidd, 2000). Despite an ongoing issue in the apparel industry that many consumers have a difficult time finding clothes that fit perfectly (Kinley, 2003, Pisut & Connell, 2007; Workman & Lentz, 2000), no study has been found examining fit seeking as one of benefits sought or examining whether fit seeking may be one of the reasons motivating consumers to conduct mass customization. Deal seeking behavior may be conducted by deal-prone consumers. Deal proneness is a consumer characteristic that describes consumers' desire to

get a good bargain and deal-prone consumers tended to seek bargains for many reasons including saving money (Arnould et al., 2002).   Among many dimensions of price suggested by Lichtenstein et al. (1993), price consciousness and sale proneness may be the closest to the behavior of deal seeking.

In the review of literature related to innovativeness, the definition of innovation and innovativeness were reviewed first. Innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995, p.11) and innovativeness as 'the degree to which an individual is receptive to new ideas' (Midgely & Dowling, 1978, p.236). Innovation may be categorized based on different aspects. Hoyer and McInnis (1997) proposed three types of innovations based on the level of behavioral change required (i.e., discontinuous innovation, dynamically continuous innovation, continuous innovation). The authors also identified another three types of innovation based on the benefits that an innovation can bring to consumers (i.e. functional innovation, aesthetic or hedonic innovation, symbolic innovation). Diffusion of Innovation Theory was often used as theoretical background to understand consumers' innovativeness (Goldsmith, 2000; Goldsmith et al., 1996; Goldsmith et al., 1993; Goldsmith et al., 1991; Goldsmith et al., 1999; Martinez & Polo, 1996; Taylor & Todd, 1995; Workman & Johnson, 1993). The theory explains that when a new idea or product is created, it becomes used by members of social system through communication (e.g., word of mouth, media) over time. An innovation is adopted either sooner or later depending on consumers' willingness to accept it. Innovators are the first ones who are willing to use innovation (Rogers, 1995).

Two types of innovativeness, fashion innovativeness and technology innovativeness, were reviewed. Fashion innovativeness is one's attribute that pursues fashion style that is perceived as new. Fashion innovator or fashion leader is a consumer who has a greater than average interest in fashion, who purchases new fashions relatively earlier than the rest of the market, and who influences later buyers to purchase new fashion items (Goldsmith et al., 1991). Technology innovativeness is one's willingness to try and use new technology (Robinson et al., 2004). In order to understand an individual's willingness to adopt new technology, Theory of Reasoned Action, Theory of Planned Behavior and Technology Acceptance Model were reviewed. Theory of reasoned action was first developed by Fishbein and Ajzen (1975). The premise of this theory is that understanding consumers' attitude and subjective norm enable the

prediction of behavioral intention and behavioral intention influences the actual behavior. Extending Theory of Reasoned Action, Ajzen (1980) developed Theory of Planned Behavior. He added perceived behavioral control (i.e., people's perception of the ease or difficulty of performing the behavior of interest) to better predict behavioral intention. Taylor and Todd (1995) decomposed Theory of Planned Behavior and proposed two elements in Perceived Behavioral Control (i.e., facilitating conditions, self-efficacy). Based on Theory of Planned Behavior, Davis (1989) developed the Technology Acceptance Model and proposed that perceived usefulness and perceived ease of use influence attitude toward the object (i.e., technology), which in turn affects intention of acceptance and the actual usage of the technology. Subjective Norm in both Theory of Reasoned Action and Theory of Planned Behavior were removed in the Technology Acceptance Model because it was not considered as a determinant of behavioral intention (Davis, 1989; Davis et al., 1989). Based on Technology Acceptance Model, Kim and Forsythe (2008) developed e-TAM in predicting consumers' willingness to adopt virtual try-on technology. The authors found that consumers' innovativeness in using the new virtual try-on technology positively influenced their attitude toward apparel online shopping and increased their intention to purchase apparel products online.

CHAPTER III
CONCEPTUAL FRAMEWORK AND HYPOTHESES

The purposes of the study were to (a) investigate purchase intention for mass-customized apparel, (b) examine the relationships among consumer, perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization and purchase intention for mass-customized apparel, and (c) identify predictors of overall purchase intention and purchase intention for specific types of mass-customized apparel. Based on the purposes of the study, a conceptual model was developed through the integration of the Theory of Planned Behavior (Ajzen, 1975), Technology Acceptance Model (Davis, 1986), as well as many previous propositions and research results (see Figure 3.1). The framework model contains five segments: (a) consumer characteristics, (b) perceived usefulness, (c) perceived behavioral control, (d) attitude, and (e) purchase intention. The development of the definition of each variable included in the framework has been discussed in Chapter one.

Variables in Each Segment of the Framework Model

The first variable of the proposed framework model is consumer characteristics, which are important external psychographic variables that can be used as bases for segmenting the market and identifying target customers of mass-customized apparel (Peter & Olson, 2005). Two types of consumer characteristics were included in the framework; which were benefits sought in apparel products, shortened as benefits sought, and innovativeness. (see Figure 3.1).

In this study, benefit sought was defined as the specific advantages that consumers look for in apparel products. Benefit sought was selected as one of the consumer characteristics variables because it can be an effective base for market segmentation and marketing strategy development (Peter & Olson, 2005), and in fact, consumer benefit is often used as a base for
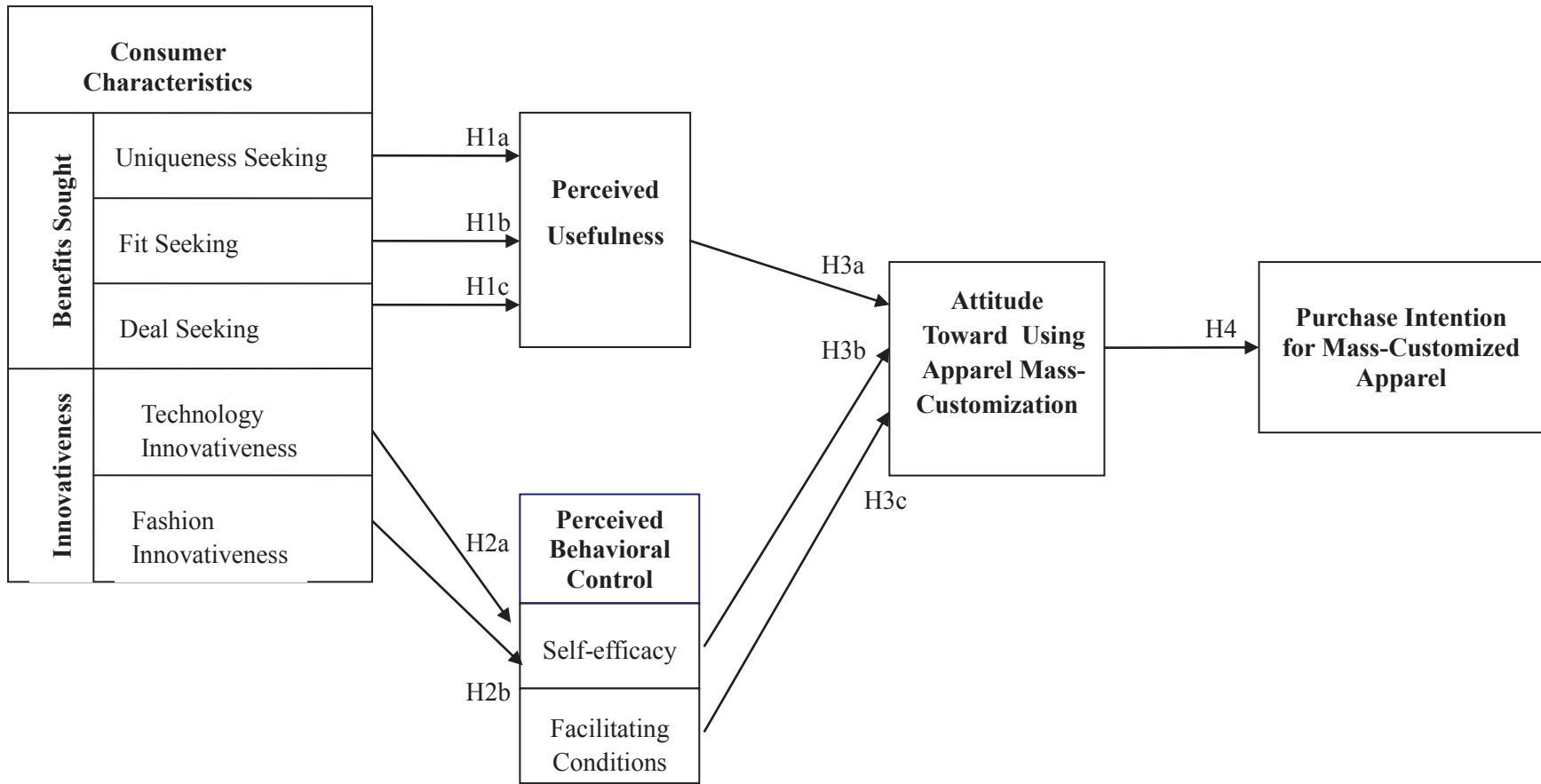
Figure 3.1 Conceptual Framework of Purchase Intention for Mass-customized Apparel

segmentation in apparel sector (Carpenter & Fairhurst, 2005; Hong & Koh, 2002; Kim & Lee, 2000; Shim & Bickle, 1994). Examining consumer benefit sought can help apparel companies to identify what consumers look for in mass-customized apparel. Three types of benefits sought were included in the framework (i.e. uniqueness seeking in apparel products, fit seeking in apparel products, deal seeking in apparel products). Uniqueness seeking in apparel products, shortened as uniqueness seeking, is a consumer's behavior to look for a specific design or construction attributes in apparel products that can distinguish them from others (Snyder & Fromkin, 1980; Tian et al., 2001). Fit seeking in apparel products, shortened as fit seeking, is a consumer's behavior to look for apparel products that conform correctly to the shape or size of the consumer's body. Deal seeking in apparel products, shortened as "deal seeking", is a consumer's behavior to look for good bargains in apparel shopping (Arnould, Price, & Zinkhan, 2002).

Innovativeness, as the second consumer characteristic included in the framework, was defined as the degree to which an individual is receptive to new ideas (Midgley & Dowling, 1978, p. 236). Different from purchasing mass-produced ready-to-wear apparel, apparel mass-customization is an innovative method of purchasing apparel. Rogers (2003) claimed that innovation is only adopted and diffused into the market when consumers are willing to accept the innovation. Thus, consumers' level of innovativeness may be an important factor in determining whether apparel mass-customization will be adopted or not. Two types of innovativeness (i.e., fashion innovativeness, technology innovativeness) were included in the conceptual framework. Fashion innovativeness is the degree to which an individual is receptive to new apparel styles and willing to buy and wear new apparel products, and technology innovativeness is an individual's degree of receptiveness to new technology and tendency to be the first in using new technologies.

The second variable of the proposed framework was perceived usefulness of apparel mass-customization, shortened as perceived usefulness, which was defined as the degree to which a consumer believes that using mass-customization would be helpful in apparel shopping (Davis, 1989). The third variable was perceived behavioral control in using apparel mass-customization, shortened as perceived behavioral control, which was defined as consumers' perception of the ease or difficulty of using mass-customization in apparel shopping (Ajzen, 1991). Based on the Theory of Planned Behavior, perceived behavioral control of a person

includes the level of confidence in performing the behavior of interest and the perceptions of the variability of resources and opportunity (Ajzen). Accordingly, two types of perceived behavioral control were included in the framework (i.e., self-efficacy in using apparel mass-customization, facilitating condition of using apparel mass-customization). Self-efficacy in using apparel mass-customization, shortened as self-efficacy, is an individual's perceived self-confidence in his or her ability to use mass-customization in apparel shopping. Facilitating condition in using apparel mass-customization, shortened as facilitating condition, is consumers' beliefs regarding access to the resources and opportunities needed to use mass-customization in apparel shopping.

Attitude toward using apparel mass-customization is the fourth variable in the framework, and it was defined as an individual's consistently favorable or unfavorable response with respect to using apparel mass-customization as a way of shopping apparel (Fishbein & Ajzen, 1975). Purchase intention for mass-customized apparel was the fifth variable and was defined as a person's probability to purchase the mass-customized apparel (Fishbein & Ajzen).

Theories Adopted in the Development of the Conceptual Framework

Two theories were adopted to develop the conceptual framework of the research. The main theory used as the foundation of the framework was the Theory of Planned Behavior (Ajzen, 1991). This theory suggests that significant relationships exist among consumer characteristics, perceived behavioral control, attitude toward using apparel mass-customization, and purchase intention for mass-customized apparel. This theory provides an essential base for the relationships among the four elements included in the framework (i.e., consumer characteristics, perceived behavioral control, attitude, purchase intention). Based on this theory, we proposed that consumer characteristics as external variables may have close relationships with perceived behavioral control such as consumers' perception of their level of self-efficacy in using the apparel mass-customization option for apparel shopping. Consumers' perceived behavior control was proposed to have a significant relationship with their attitude toward apparel mass-customization, and attitude toward apparel mass-customization was proposed to be a predictor of purchase intention for mass-customized apparel.

Technology Acceptance Model (Davis, 1986) was also integrated into the framework to support the role of perceived usefulness in the adoption of apparel mass-customization.

According to this model, perceived usefulness is a likely predictor of the attitude toward an innovation and of the adoption of an innovation. Apparel mass-customization, as a new way of shopping apparel, may be perceived as an innovative shopping method. In using apparel mass-customization, consumers may use up-to-date technologies such as interactive image creator or real-time communication tools in the shopping process. The Technology Acceptance Model argued that consumer characteristics as external variables may have relationships with perceived usefulness, and perceived usefulness may have a close relationship with attitude toward the adoption of a new technology. Applying the relationships presented in the Technology Acceptance Model in the current study, we proposed that consumer characteristics have significant relationships with perceived usefulness of apparel mass-customization, and perceived usefulness of apparel mass-customization have a close relationship with attitude toward apparel mass-customization.

Proposed Relationships in the Framework and Hypotheses

In this section, the relationships proposed in the framework were discussed and four hypotheses were generated to examine the proposed relationships. Hypotheses 1 to 4 were developed to test the relationships among the variables of consumer characteristics (i.e. benefits sought, innovativeness), consumers' perceived usefulness, perceived behavioral control (i.e. self-efficacy, facilitating condition), attitude toward using apparel mass-customization, and purchase intention for mass-customized apparel. Hypotheses 5 through 8 were developed to identify the best predictor(s) of the overall purchase intention for mass-customized apparel and for the three types of mass-customized apparel (i.e. design mass-customized apparel, fit mass-customized apparel, personalized mass-customized apparel).

<u>Benefit Sought and Perceived Usefulness of Apparel Mass-customization (Hypothesis 1)</u>

Three types of benefits sought were included in the framework (i.e. uniqueness seeking, fit seeking, deal seeking). These three types of benefit sought were proposed to have significant relationships with perceived usefulness of apparel mass-customization. The relationships of each

type of benefit sought and perceived usefulness of apparel mass-customization were discussed in the following:

With regard to uniqueness seeking, many researchers (Arnould et al., 2002; Snyder, 1992) recognized that consumers have the need to be unique and this type of need was defined as 'the need to perceive oneself as different from others' (Arnould et al., p. 395). Hart (1995) stated that, in order to implement mass-customizing business, customers' demand for uniqueness needs to be high because the nature of mass-customization is to provide consumers with goods that are different from off-the-rack products. Consumers who desire uniqueness will find mass-customization appealing because mass-customization offers products that can distinguish them from others. For example, a consumer who desires to express uniqueness in his dress shirt may find a manufacturer that offers online customization, select design features (e.g. collar, pocket, cuffs) to his preference, and as a result, build a dress shirt that differs from mass-marketed ready-to-wear dress shirts. According to Burns and Bryant (2005), design customization and personalization provide consumers opportunities to express their uniqueness. Based on these propositions, uniqueness seeking was included in the framework as one type of benefit sought, and consumers who seek more uniqueness in their clothing outfits were expected to perceive apparel mass-customization to be more useful.

The second type of benefit sought included in the study was fit seeking. Howarton and Lee (2010) found that consumers perceived fit as a major factor in purchasing apparel. Previous studies reported that consumers were rather confused by the existing sizing system for ready-to-wear apparel and that they had problems finding the right fit (De Klerk & Tselepis, 2007; Pisut & Connell, 2007; Workman & Lentz, 2000) but they were not willing to purchase ready-to-wear clothing that required alterations (Howarton & Lee, 2010). Burns and Bryant (2005) stated that through fit customization, consumers are able to purchase made-to-measure clothing that can better fit their body. Boer and Dulio (2007) explained that in the shoe mass-customization industry, through fit mass-customization, customers are able to purchase a pair of shoes that provides best-matched fit. One of the technologies that may be used in fit customization is body scanning. Fiore et al. (2003) reported that consumers were willing to try body-scanning in order to find apparel products with better fit. Given the current level of consumer satisfaction in regards to apparel fit and the ability of mass-customization in providing products with better fit,

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fit seeking was included in the framework as one type of benefit sought, and consumers who seek better fit were expected to perceive apparel mass-customization to be more useful.

The third type of benefit sought included in the study was deal seeking. While the purpose of providing mass-customized products to consumers includes selling products that exactly meets consumer's desire (Pine II, 1993), purchasing mass-customized products requires paying premium, (i.e., extra money) in order to make the product which exactly meets consumers' wants and needs. Kamali and Loker (2002) found that consumers showed high willingness to purchase mass-customized t-shirts but were not willing to pay too much for them. In the study of Anderson-Connell et al. (2003), price was also one of the consumers' concerns that created barrier in conducting apparel mass-customization. Knowing this premise of mass-customization, deal seeking was included in the framework as one type of benefit sought, and was expected to have a negative relationship with consumers' perceived usefulness of apparel mass-customization. Consumers who seek lower prices or deals in apparel shopping were expected to perceive apparel mass-customization to be less useful.

According to above discussions, Hypothesis 1 (H1) was proposed to examine the relationship between benefit sought and perceived usefulness. Three sub-hypotheses were proposed under H1 to examine the relationship between each type of benefit sought (i.e., uniqueness seeking, fit seeking, deal seeking) and perceived usefulness.

H1. There will be a significant relationship between benefits sought and perceived usefulness of apparel mass-customization.

H1a. The respondents who have a higher degree of uniqueness seeking in apparel products will perceive apparel mass-customization to be more useful.

H1b. The respondents who have a higher degree of fit seeking in apparel products will perceive apparel mass-customization to be more useful.

H1c. The respondents who have a higher degree of deal seeking in apparel shopping will perceive apparel mass-customization to be less useful.

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┌─────────────────────────┐
│     Benefits Sought     │
├─────────────────────────┤
│                         │              ┌──────────────┐
│    Uniqueness Seeking   │──── H1a ───▶ │              │
├─────────────────────────┤              │  Perceived   │
│       Fit Seeking       │──── H1b ───▶ │  Usefulness  │
├─────────────────────────┤              │              │
│      Deal Seeking       │──── H1c ───▶ │              │
│                         │              └──────────────┘
└─────────────────────────┘
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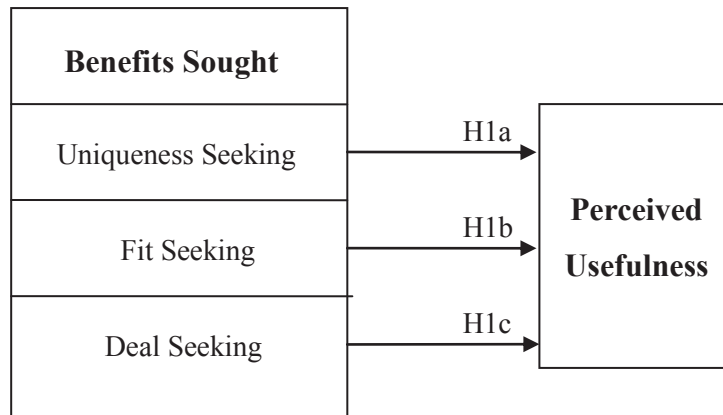
Figure 3.2 Relationships between Benefit Sought and Perceived Usefulness

Innovativeness and Self-efficacy in Using Apparel Mass-customization (Hypothesis 2)

Two types of innovativeness (i.e., fashion innovativeness, technology innovativeness) were included in the conceptual framework. These two types of innovativeness were proposed to have a significant relationship with self-efficacy. Self-efficacy is one type of perceived behavioral control proposed by Taylor and Todd (1995). The relationship of each type of innovativeness and self-efficacy in using apparel mass-customization for apparel shopping was discussed in the following:

With regard to the relationship between fashion innovativeness and self-efficacy in using apparel mass-customization for apparel shopping, Belleau et al. (2001) found that fashion innovators rated themselves as being much more self-confident than fashion followers. Fashion innovators were more aware and interested in fashion products, and thus, had higher self-confidence in adopting new apparel products. Different from fashion innovators, fashion followers were neither as aware of nor as interested in new fashion products, and thus, had lower self-confidence in adopting new apparel products. Goldsmith et al. (1996) found that fashion innovators were more knowledgeable about fashion products than fashion followers. Supporting Goldsmith, et al., Goldsmith (2000) found that knowledge about apparel products was highly correlated with innovativeness. When a consumer had more knowledge about apparel or apparel shopping, he or she was more likely to have higher confidence in shopping apparel (Biswas &

Sherell, 1993). Based on these research results, consumers who are more innovative in fashion were expected to have higher self-efficacy in participating in apparel mass-customization.

As regarding the relationship between technology innovativeness and self-efficacy in using apparel mass-customization, Parveen and Sulaiman (2008) found that consumers' technology innovativeness had a positive relationship with perceived ease of using new information technology such as using the Internet through a mobile device. Venkatesh and Davis (2000) found that self-efficacy was the antecedent of perceived ease of use. These findings suggest that a significant relationship may exist between technology innovativeness and self-efficacy of using apparel mass-customization. Consumers who have a higher degree of innovativeness in technology may be more willing to try new technology without being afraid of it, and thus, may have more self-efficacy in using the mass-customization option. For example, if a consumer is computer-savvy, he or she may feel more confident in ordering mass-customized apparel through the Internet. Therefore, consumers who are more innovative in technology were expected to have more self-efficacy in the process of apparel mass-customization.

As it relates to the aforementioned studies, Hypothesis 2 (H2) was formulated to examine the relationships between innovativeness and self-efficacy in the process of apparel mass-customization. Under H2, two sub-hypotheses were proposed to test the relationship between each type of innovativeness (i.e., fashion innovativeness, technology innovativeness) and self-efficacy in the process of apparel mass-customization.

H2. There will be a significant relationship between innovativeness and self-efficacy of using apparel mass-customization.

> H2a. The respondents who are more innovative in fashion will have more self-efficacy of using apparel mass-customization.
>
> H2b. The respondents who are more innovative in technology will have more self-efficacy of using apparel mass-customization.

Innovativeness		Perceived Behavioral Control
Technology Innovativeness	→ H2a	Self-efficacy
Fashion Innovativeness	→ H2b	Facilitating Conditions
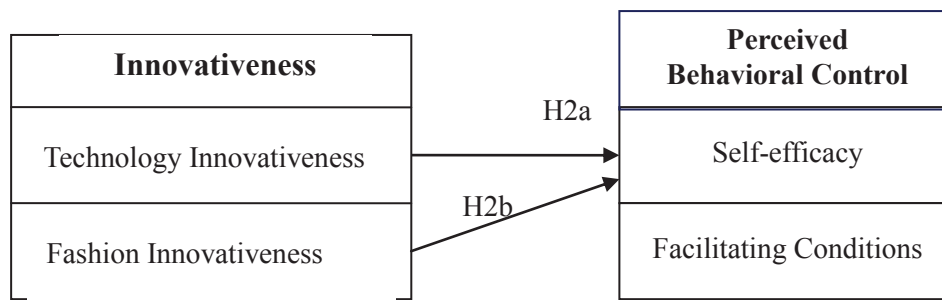
Figure 3.3 Relationships between Innovativeness and Self-efficacy

<u>Factors Influencing Attitude toward Using Apparel Mass-customization (Hypotheses 3)</u>

Three variables were proposed to be the predictors of attitude toward using apparel mass-customization and they include perceived usefulness of apparel mass-customization and two types of perceived behavioral control (i.e., self-efficacy and facilitating conditions in using apparel mass-customization). The Technology Acceptance Model (Davis, 1986) suggested that perceived usefulness may affect attitude toward acceptance of new technology. This proposition was supported by several studies. Kim et al. (2009) investigated the likelihood of U.S. consumers adopting mobile technology for purchasing fashion goods and found that perceived usefulness was a predictor of attitude toward mobile communication and mobile commerce. Cho and Fiorito (2009) investigated consumers' acceptance of online customization for apparel shopping and also found a significant relationship between perceived usefulness and attitude toward online apparel customization. According to these propositions and the research results, a significant relationship was expected between perceived usefulness of apparel mass-customization and attitude toward apparel mass-customization.

Taylor and Todd (1995) used VCR-Plus as an innovative technology in their study related to the Theory of Planned Behavior and found that both self-efficacy and facilitating conditions influenced attitude toward acceptance of VCR-Plus. Lassar, Manolis, and Lassar (2005) investigated the relationship between Internet self-efficacy and attitude toward online banking option, and found that consumers' self-efficacy had a significant relationship with attitude toward online banking. According to these research results, self-efficacy and facilitating conditions in using mass-customization were expected to have a significant relationship with attitude toward using apparel mass-customization.

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Based on the discussions above, Hypothesis 3 (H3) was formulated to test if the three variables (i.e., perceived usefulness, self-efficacy, facilitating conditions) were significantly associated with respondents' overall attitude toward apparel mass-customization. Under H3, three sub-hypotheses were proposed to examine the relationship between each variable and overall attitude. (See Figure 3.4).

H3.　Perceived usefulness, self-efficacy and facilitating conditions are significantly associated with overall attitude toward using apparel mass-customization.

H3a　The respondents who perceive apparel mass-customization as being more useful will have a more positive overall attitude toward using apparel mass-customization.

H3b　The respondents who have higher self-efficacy will have a more positive overall attitude toward using apparel mass-customization.

H3c　The respondents who perceive that they can more easily access to the resources needed to use apparel mass-customization will have a more positive overall attitude toward using apparel mass-customization.
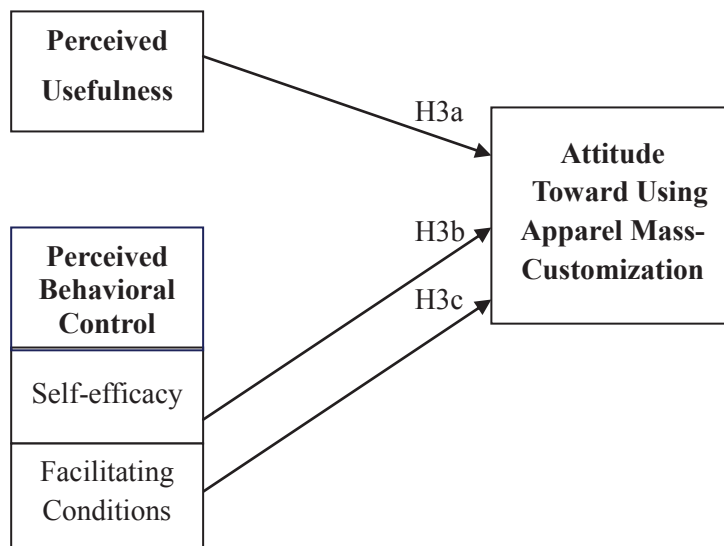
Figure 3.4　Relationships of Attitude toward Using Apparel Mass-customization with Perceived Usefulness and Perceived Behavioral Control

The Theory of Planned Behavior (Ajzen, 1988), the decomposed version of the Theory of Planned Behavior (Taylor & Todd, 1995), and the Technology Acceptance Model (Davis, 1986) all support the notion that attitude toward an object or activity will affect behavioral intention. Many study results showed that when the respondents have a positive attitude toward an object or activity, they had a higher purchase intention or were more willing to purchase a product (Belleau, Summers, Zu, & Pinel, 2007; Dickson, 2000; Kim & Forsythe, 2008; Park & Kim, 2007; Shen, Dickson, Lennon, Montalto, & Zhang, 2003; Wang et al., 2007). Based on the above theories and study results, attitude toward using apparel mass-customization was expected to be significantly associated with purchase intention for mass-customized apparel.

Based on the discussions above, Hypothesis 4 (H4) was formulated to test if there is a significant relationship between attitude toward using apparel mass-customization and purchase intention for mass-customized apparel.

H4. The respondents who have more a positive overall attitude toward using apparel mass-customization will have a higher intention to purchase mass-customized apparel.
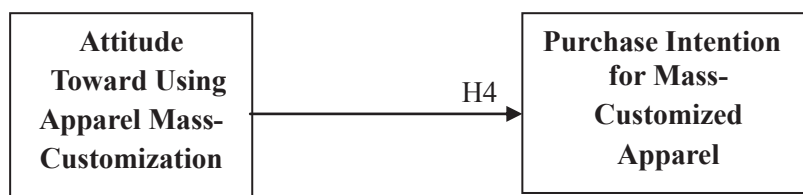
Figure 3.5   Relationship between Attitude toward Using Apparel Mass-customization and Purchase Intention for Mass-customized apparel

In addition to the overall apparel mass-customization, three specific types of apparel mass-customization (i.e., design mass-customization, fit mass-customization, personalization mass-customization) were also included in the current study because the factors that influence different types of attitudes may vary. For example, consumers who seek uniqueness in apparel

shopping may have a favorable attitude toward design mass-customization, but may not have the same attitude toward using fit mass-customization in apparel shopping.

Design mass-customization is a type of apparel mass-customization, which allows consumers to select their own style, color, or print preferences. Consumers can view their selection through a computer illustration before the manufacturer begins producing the garment (Burns & Bryant, 2005). Fit mass-customization is a type of apparel mass-customization, which allows the consumers to provide one or more body measurements to the manufacturer for production of a garment that specifically fits the consumer's body (Burns & Bryant). Personalization mass-customization is a type of apparel mass-customization, which allows customers to add personalized details such as a monogram, personal embroidery, laser stitching, and fabric ornamentation to the purchased item (Burns & Bryant).

The selection of design mass-customization and fit mass-customization was based on many previous studies in apparel mass-customization (Cho & Fiorito, 2009; Endo & Kincade, 2008; Lee & Chen, 1999; Lee et al., 2002), in which, researchers often considered these two types of apparel customization to be the most important aspects in apparel mass- customization. Personalization was also included as one type of apparel mass-customization because it is the most commonly performed apparel mass-customization in the current apparel industry. For example, apparel retailers such as L.L. Bean and Lands' End give their customers the option of monogramming initials for many of their apparel products through their website and catalogues. Personalization mass-customization can be considered as a form of design customization. However, considering that personalization is performed after the product is completely manufactured, and that it does not influence main design features of apparel, it was categorized as a separate type of apparel mass-customization. More in-depth discussion in the selection of three different types of apparel mass-customization will be included in the next chapter.

To identify which of the variables proposed in the framework and the demographics are better predictors for overall purchase intention for mass-customized apparel and for the each type of mass-customized apparel (i.e., design mass-customized apparel, fit mass-customized apparel, personalization mass-customized apparel), four hypotheses were extracted and are stated as below:

H5 Predictors of overall purchase intention for mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, facilitating conditions in using apparel mass-customization (i.e., money availability, time availability), and overall attitude toward using apparel mass-customization.

H6 Predictors of purchase intention for design mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of design mass-customization, self-efficacy in using design mass-customization, facilitating conditions in using design mass-customization (i.e., time availability, money availability), and attitude toward using design mass-customization.

H7 Predictors of purchase intention for fit mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of fit mass-customization, self-efficacy in using fit mass-customization, facilitating conditions in using fit mass-customization (i.e., time availability, money availability), and attitude toward using fit mass-customization.

H8 Predictors of purchase intention for personalized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of personalization mass-customization, self-efficacy in using personalization mass-customization, facilitating conditions in using personalization mass-customization (i.e. time availability, money availability), and attitude toward using personalization mass-customization.

CHAPTER IV
RESEARCH METHODS

In this chapter, the research methods used in the study were addressed. The selected research design was addressed in the first section, followed by the section that explained the selection of the types of apparel mass-customization along with the specific scope of apparel mass-customization in terms of levels of variety. A description of the selected product category and subjects was provided in the third section. The fourth section specified the process of questionnaire development, including the measures of the variables and the efforts in increasing the validity and the reliability of instrument. Lastly, the data collection procedure and the data analysis methods were discussed.

Research Design

A survey research design was used to examine the relationships proposed in the framework. Zikmund (2003) defined survey as "a method of primary data collection based on communication with a representative sample of individuals" (p. 141) and stated that a survey provides a quick, flexible, efficient, and accurate means of assessing information about a population. A survey research design facilitates a quantitative research process by collecting completed surveys from many people. The data collected in prior studies of apparel mass-customization was mainly by focus groups or surveys with a convenience sample such as college students (Anderson-Connell et al., 2002; Choy & Loker, 2004; Endo & Kincade, 2005, 2008; Fiore et al., 2003, 2004; Lee et al. 2002). Collecting the data from a group of many respondents that resembles the characteristics of a national population may provide information that helps apparel marketers to better understand the factors that influence consumers' attitudes toward

using apparel mass-customization and the predictors of purchase intention for mass-customized apparel among the U.S. consumers.

Selection of Types of Apparel Mass-customization and Level of Variety

Based on Burns and Bryant (2005), three types of apparel mass-customization were selected to be investigated in the current study (i.e., design mass-customization, fit mass-customization, personalization mass-customization). Lee et al. (2002) stated that apparel mass-customization regarding design and fit were performed through a co-design process. Burns and Bryant indicated that design and fit mass-customization were the two most essential types of co-design in apparel mass-customization. In addition, Endo and Kincade's (2008) study results also showed that the consumers' attitudes toward mass-customized apparel products were most closely related to the needs related to design and fit. Because of the significance of design and fit aspects in apparel mass-customization, these two types of mass-customization were included in the study. Personalization is also an important part of apparel mass-customization along with design and fit (Burns & Bryant, 2005) and is the most commonly practiced apparel mass-customization in the current apparel industry. In personalization mass-customization, apparel firms can take advantage of high modularity without having to be involved in extensive communication with their customers. For example, L.L. Bean offers to its customers the option to have initials embroidered on their tote bag, and J.Crew offers the personalization of monogrammed initials on products such as cashmere sweaters.

Table 4.1 shows three types of apparel mass-customization (i.e., design mass-customization, fit mass-customization, personalization mass-customization) with different levels of modularity and variety. In design mass-customization, style, color, fabric or other materials may be mass-customized based on the level of variety that the customer wants and on the capacity of what the firm is able to provide. For example, if a customer can design his/her own style and use the fabric of his/her own choice to order a customized apparel, then the variety offered in the design mass-customization is very high, but the level of modularity is very low because a limited number of pre-cut modules can be used to produce the garment. If a customer can only choose a pocket design among several options provided by the manufacturer, then the

variety offered is low but the level of modularity is high because many components of the garment can be pre-cut.

Table 4.1   Three types of apparel mass-customization with various levels of variety/ modularity

Time of the Selection Applied into the Product	Level of Variety and Modularity	Design Preference	Fit Preference
Design/fit selection is applied during the production	Very high variety and very low modularity	Design Mass-customization	Fit Mass-customization
	High variety and low modularity		
	Mid variety and mid modularity		
	Low variety and high modularity		
	Very low variety and very high modularity		
Design is added after the production is completed	No variety in style choice but possibly high variety in adding printing or embroidery designs	Personalization Mass-customization	

In fit mass-customization, the level of variety and modularity may also differ. For example, if a manufacturer allows its customer to provide his/her body measurements and select his/her fit preferences, such as tailored fit or loose fit, to produce a mass-customized apparel, then the variety in fit that the manufacturer provided is high but the level of modularity is low because no components can be pre-cut. In this case, the manufacturer has to cut the components of the garment based on the customer's specific body measurement and his/her fit preference. If a customer can only select a tailored fit or loose fit among specific sizes, then the variety is low, but the level of modularity is high because all the components of a garment can be pre-cut into modules.

Taking both design and fit apparel mass-customization into account, some cases of apparel mass-customization exist where both design mass-customization and fit mass-customization can be implemented with different levels of variety. As an example, a manufacturer may not offer any design options for mass-customization but may allow a customer to provide his/her body measurements for custom fit. In this case, the level of variety in design mass-customization is zero but the level of variety in fit mass-customization is high. As another

example, a manufacturer may have a customer build his/her own garment by selecting all the major design features (e.g. style, color, fabric) but produce the garment only in standardized sizes. In this case, the level of variety in design mass-customization is high but the level of variety in fit mass-customization is low. As mentioned in the above examples, because the levels of variety in design mass-customization of apparel can be independent from that of fit mass-customization, these two types of mass-customization were placed in parallel columns in Table 4.1.

Personalization mass-customization can be considered as a design mass-customization with the lowest variety in style choice because the manufacturing of the product has already completed**.** However, the variety in adding printing or embroidery designs is very high because various printings such as pictures or monogramming initials may be added on the product as the customer's choice. Therefore, in Table 4.1, personalization is on the same column of design customization.

To better illustrate that the levels of variety in design mass-customization and in fit customization can be independent, a matrix was used to provide a few examples (see Figure 4.1). This matrix can show the level of variety in most types of apparel mass-customization. In other words, the level of variety in most cases of apparel mass-customization can be located on the matrix in Figure 4.1. For example, Anderson-Connell, Ulrich and Brannon's (2002) totally custom can be located on spot (a), showing that totally custom provides products with very high variety (very low modularity) in both design and fit. Anderson-Connell et al.'s design option with standardized sizes can be located in spot (b) on the matrix, showing that design option with standardized sizes provides products with a medium level of variety/modularity in design but a very low level of variety (very high modularity) in fit. The level of modularity of various types of mass-customized products can also be illustrated on the matrix. For example, if a customer wants to mass-customize a dress shirt by selecting one design option among three options and wants the dress shirt to be made based on his measurements of neck circumference and arm length, the level of variety of this mass-customized dress shirt can be located on spot (c). This type of mass-customization has low variety (high modularity) in design but high variety (low modularity) in fit. If a female shoe customer wants to design her own pair of athletic shoes by choosing material, fabric, style, and colors from the manufacturer-offered selection and asks the manufacturer to make the left shoe a size 7.5 and the right shoe a size 8, then this combination of design and fit mass- customization, can be located on spot (d). This type of mass-customization

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has high variety (low modularity) in design but low to medium variety (medium to high modularity) in fit.
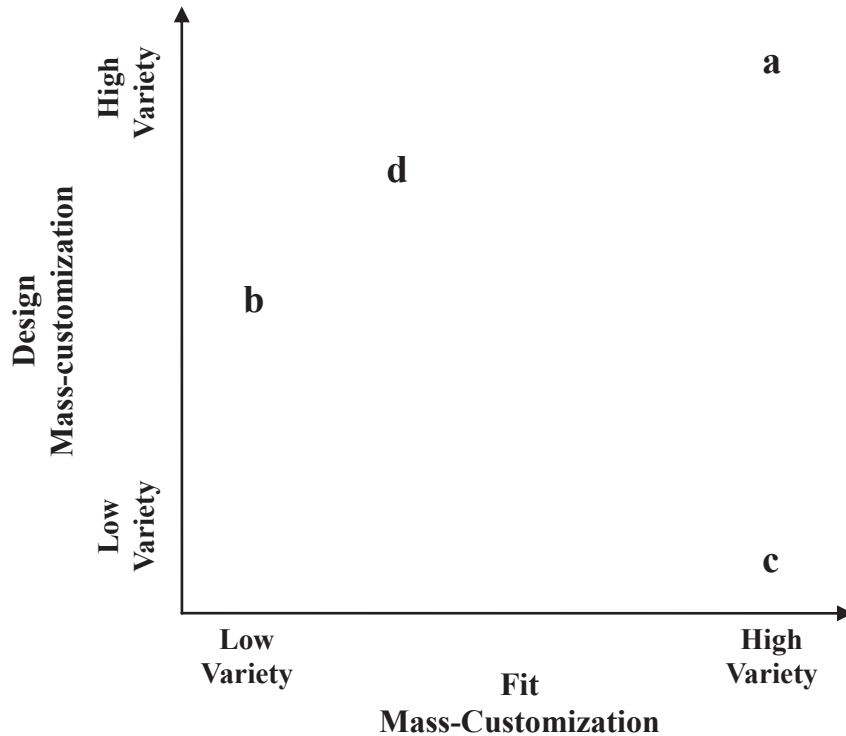
Figure 4.1 Matrix of Level of Variety in Design and Fit Mass-customization

Consumers' attitudes toward using apparel mass-customization and intention to purchase mass-customized apparel with a high level or a low level of variety may be very different. Endo and Kincade's study (2005) indicated that consumers' levels of interest in mass customization of shoes varied. This variance may also be applied to other apparel products. With the variety of fabrics, styles and fibers available for choice in apparel, with the known variances in consumer preferences, and with the limitations of manufacturing facilities, narrowing the scope of apparel mass-customization is inevitable. According to Kotler and Armstrong (2010), implementing niche marketing by targeting a smaller and narrowed-down market niche and using effective marketing strategies are desirable for profitability. Therefore, in the current study, the levels of the apparel were limited to low variety/high modularity or very low variety/very high modularity in both design and fit mass-customization.

In Table 4.2 and Figure 4.2, the gray-highlighted areas were used to indicate the scope of the current study regarding the level of variety in apparel mass-customization. Apparel mass-customization with low levels of variety was selected because in current apparel marketing, more companies, such as Lands' End, www.Shirtsmyway, and www.Raresplendors.com, offer design and fit mass-customized apparel with low to medium variety. Lands' End offers mass-customized dress shirts by offering a few style options for pocket, sleeves, cuffs, and collars, and by providing a few fabrics with some colors as options, but does not produce a dress shirt of which the design is totally created by a customer. In regards to fit preferences, Lands' End required customers to select measurements of relevant body parts from a dropdown selection but did not perform whole body scanning to obtain exact body measurements.

Table 4.2 The Scope of the Current Study regarding the Level of Variety in Apparel Mass-customization

Time of the Selection Applied into the Product	Level of Variety and Modularity	Design Preference	Fit Preference
Design/fit selection is applied during the production	Very high variety and very low modularity		
	High variety and low modularity		
	Mid variety and mid modularity		
	Low variety and high modularity	Design Mass-customization	Fit Mass-customization
	Very low variety and very high modularity		
Design is added after the production is completed	No limitation in variety and no modularity.	Personalization Mass-customization	

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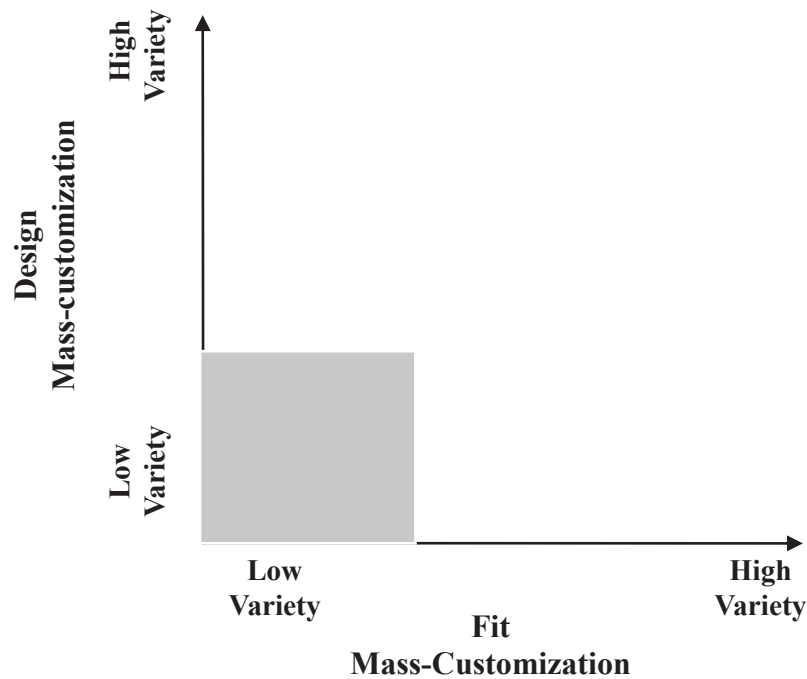
Figure 4.2. The Scope of the Current Study regarding the Level of Variety in Apparel Mass-customization

Selection of Garment Category and Subjects for Data Collection

Men's dress shirt was selected as the apparel category in the current study because all three types of apparel mass-customization (i.e. design mass-customization, fit mass-customization, personalization mass-customization) can be performed. In Goldsmith and Freiden's (2004) study, the consumers reported dressy clothes were more appropriate for mass-customization than were casual clothes. Dressy and formal garments needed for the work environment, such as men's dress shirts, may be more demanded for apparel mass-customization because the consumer may desire a mass-customized dress shirt to look professional at the work place. In the current industry trends regarding mass-customization of apparel products, men's dress shirt was one of the most prevalent and popular apparel product category for apparel mass-customization; for example, companies such as Lands' End (www.landsend.com), Shirts My Way (www. shirtsmyway.com), and Raresplendors.com offered mass-customized dress shirts for men through their websites.

The respondents of the current study were consumers who resided in the United States (U.S.), were males of age 20 years or older, and held an occupation in one of the two categories, (a) Sales and Office occupations or (b) Management, Professional and related occupations based on the categories used in the U.S. Census. Based on the previous study results showing that teenagers had different apparel shopping behaviors than that of adults (Cho & Chen-Yu, 2008), adults of age 20 years and older were selected. Endo and Kincade (2005) noted that participants with a high level of interest in the product were better subjects for the study. The target customers of men's mass-customized dress shirts were expected to be the men who frequently wore dress shirts. Therefore, instead of sampling all male consumers in the U.S., men who were expected to wear dress shirts more often were considered to be better respondents for the current study. The U.S. Census Bureau categorized occupations into six groups (U.S. Census, 2009). Among the six categories, men in (a) Sales or Office occupations or (b) Management, Professional and related occupations were selected because men in these occupations were expected to wear dress shirts more frequently than men in other occupations such as Farming, Fishing, and Forestry Occupations, Construction Occupations, and Production, Transportation and Material Moving Occupations, and Service Occupations (e.g., building and grounds cleaning and maintenance, food preparation and serving, personal care and service). The respondent's occupation instead of the frequency of wearing dress shirts was used as one of the recruitment criteria because occupation is categorized as a consumer's demographic characteristic (Kotler & Artmstrong, 2010). For marketers, it is easier to segment and target customers based on consumers' demographic information such as occupation, than to use behavioral characteristics such as frequency of wearing dress shirt because such information may not be available. By targeting the customers based on occupation, marketers are able to develop effective marketing strategies to cater to the consumers who may have higher demand for the mass-customized apparel.

The sample size was set at 400 but 474 respondents participated in the online survey. Respondents were recruited by a survey company, Market Tools, which provides samples from approximately two million panel members nationwide. Incentives (e.g., credits for purchasing merchandise, gift cards) were provided to recruit the respondents.

Questionnaire Development

A self-administered questionnaire was developed as the instrument of data collection. Some of the questions included in the questionnaire were adopted from previous studies. Some were adapted to suit the topic of the current research, and others were developed by the researcher based on questions developed by other researchers or on the results from related previous studies.

Two pilot tests were conducted before the main data collection. The first pilot test was conducted with 42 male respondents recruited by the marketing research company, Market Tools, through email notification sent to its members who met the recruitment criteria: male U.S. residents whose age was 20 or older and who held a job in either (a) sales and office occupations or (b) managerial, professional, and related occupations. The pilot test was to examine whether the questions were clear and understandable, and if they could successfully measure the diversity of responses (i.e., the respondents would not all agree or all disagree with the statement). De Vaus (2002) indicated that from the results of a pilot test, researchers should check the ability of a question to discriminate. If almost everyone responds with the same answer to a question, that question is often not very useful because one of the purposes of using a questionnaire is to examine the diversity of views on a subject. After making adjustments and modifications based on the responses from the first pilot test, a second pilot test with a convenience sample of 11 was conducted to ensure that the changes made to the questionnaire did improve the clarity and the ability to differentiate. The respondents were males who were 20 years or older who had a job in management, professional and related occupations. The results of the second pilot test confirmed that the modifications made successfully improved the questions in clarity and the ability to discriminate. A total of 99 questions were included in the final questionnaire, which can be found in Appendix A.

The order of the questions was the following: (a) consumer characteristics, including benefits sought (i.e., uniqueness seeking, fit seeking, deal seeking) and innovativeness (i.e. fashion innovativeness, technology innovativeness), (b) perceived usefulness, self-efficacy, and facilitating conditions (c) attitude toward using apparel mass-customization and purchase intention for mass-customized apparel, and (d) purchase and usage behavior of ready-to-wear dress shirts and experiences in purchasing mass-customized apparel, and (e) demographics. The

questions measuring money availability in facilitating conditions were asked after the questions measuring the amount of money that the respondent normally paid for a ready-to-wear dress shirt and how much he was willing to pay for a mass-customized dress shirt compared to what he normally paid for a ready-to-wear dress shirt. McFarland (1981) suggested that in planning the order of survey questions, the researcher has to consider question-order effects or priming. Priming is a term that explains "the effects of a prior context on the interpretation and retrieval of information" (Fiske & Taylor, 1991, p. 231) in survey responses, and respondents' priming from the preceding question may decrease the possibility of obtaining the true answer in the subsequent question. To avoid priming, the questions asking how much they normally paid for ready-to-wear dress shirts and how much they are willing to pay for mass-customized dress shirts were asked first so that the respondents would objectively consider the premium that they were willing to pay for a mass-customized dress shirts without consideration of whether they had money for mass-customized dress shirts at the moment they filled out the survey. In addition, questions measuring uniqueness seeking and deal seeking contained items in more than one factor from the original source, and items measuring fashion innovativeness contained questions from two sources. To avoid listing similar questions in sequence, which may cause respondents to feel bored and read the questions carelessly, the questions measuring the same variable were shuffled. Based on Lasorsa (2003), shuffling questions significantly reduces the chance of respondents' preconception from the similar previous questions affecting their answers to the subsequent question. The following sections explain in detail how the questionnaire was developed.

<center>Measures of Variables</center>

Eight variables were measured in the questionnaire including (a) benefit sought (i.e., uniqueness seeking, fit seeking, deal seeking), (b) innovativeness (i.e., fashion innovativeness, technology innovativeness), (c) perceived usefulness, (d) perceived behavioral control (i.e., self-efficacy, facilitating conditions), (e) attitude toward using apparel mass-customization, (f) purchase intention for mass-customized apparel, (g) usage of dress shirts and experiences, and (h) demographics. Throughout the questionnaire, except for the measures of usage and experiences of dress shirts, and demographics, all other variables were measured by a four-point

<center>83</center>

Likert type scale with the same rating scale. The scale was set with "1" as strongly agree and "4" as strongly disagree. Using the same rating scale is reported to provide consistency (Cozby, 2007).

Hayes (1998) explained that the Likert-type format is designed to allow customers to answer in varying degrees. When researchers are interested in obtaining more definitive responses from the respondents, a four-point Likert type scale as a forced-response option can be used to eliminate the neutral response. Lissitz and Green (1975) and Matell and Jacoby (1971) reported that test-retest reliability was similar between the four-point and five-point scales. However, Matell and Jacoby reported that the predictive coefficient of a four-point scale was better than a five-point scale because the neutral response was eliminated. The results showed that the predictive validity coefficient of the four-point scale (0.62) was greater than that of the five-point scale (0.15). For these reasons, four-point Likert type scales were used as the response scale for most of the questions in the questionnaire.

The following sections provide a detailed description of the instrument development for the current study. These parts were used to segment the discussions of the measures; however, the questions in the questionnaire were listed continuously without sections. In Part I, three qualifying questions were used to ask gender, age, and occupation, which were designed to screen out the panel members who do not qualify for the criteria used for the section of the subjects (i.e., female, younger than age 20, occupations other than sales and office occupation and managerial, professional, and related occupations). All of the variables included in the conceptual framework were categorized into three parts, Parts II to IV. Part II contains the two independent variables (i.e. benefit sought, innovativeness). Part III contains the three mediating variables (i.e., perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization). Part IV covers the dependent variable (i.e., purchase intention for mass-customized apparel). Part V lists the measures of demographics.

Part I. Qualifying Questions

The participants of the current study were male consumers of age 20 years or older who reside in the United States and held an occupation in one of two categories, (a) Sales and Office occupations or (b) Management, Professional and related occupations based on the categories used in the U.S. Census. Respondents who did not meet the criteria were screened out by the

three qualifying questions shown in Table 4.3. Respondents who were not male, were younger than 20 or did not have an occupation in either (a) management, professional, and related occupation or (b) sales and office occupation were screened out.

Table 4.3 Qualifying Questions

Sources	Items	Q #

Developed by the researcher	What is your gender?
	   1. Male
	   2. Female
		1

American Community Survey (2009)	My age is:
	   Younger than 20
	   20-24
	   25-29
	   30-34
	   35-39
	   40-44
	   45-49
	   50-54
	   55-59
	   60-64
	   65-69
	   70-74
	   75-79
	   80-84
	   85 or older
		2

American Community Survey (2009)	My occupation is in the category of - Management, professional, and related occupations (e.g. management, business and financial operations, computer, architecture, engineering, life/physical science, community/social science, legal, education, training, library, entertainment, media, healthcare practitioner/technician) - Service occupations (e.g. healthcare support, protective service, food preparation and serving, building and grounds cleaning and maintenance, personal care and service) - Sales and office occupations (e.g. sales , office and administrative support) - Farming, fishing, and forestry occupations - Construction, extraction, maintenance, and repair occupations (e.g. carpenters, stonemasons, construction laborers) - Production, transportation, and material moving occupations (e.g. bakers, truck drivers, bus drivers)	3

Part II: Independent Variables

The following section is a description of instrument development for the two main independent variables (i.e. benefits sought, innovativeness).

<u>Measures of Benefit Sought</u>

In this section, the measures of the first independent variable, benefit sought, are discussed. Three types of benefit sought (i.e. uniqueness seeking, fit seeking, deal seeking) are included.

<u>Uniqueness seeking</u>. The definition of uniqueness seeking in this study is a consumer's behavior to look for specific design or construction attributes in apparel products that can distinguish them from others (Snyder & Fromkin, 1980; Tian et al., 2001). The definition of each variable was discussed in Chapter One, the section of Conceptual definition. Tian, et al.'s Consumers' Need for Uniqueness Scale included a total of 31 items, and the factor analysis in their study revealed three factors (i.e. Avoidance of Similarity, Unpopular Choice, Creative Choice). From the 31 items of Tian et al.'s Consumers' Need for Uniqueness Scale Knight and Kim (2007) extracted eight items to examine consumers' need for uniqueness in apparel products, and the factor analysis results in Knight and Kim's study also grouped the eight items into the same three factors as the original 31-item scale developed by Tian et al (2001). To measure uniqueness seeking in the current study, the eight items used in the study of Knight and Kim (2007) were adapted because these items were specifically suitable for examining consumers' need for uniqueness in the apparel domain. Table 4.4 shows the items of the eight original items from Knight and Kim's scale in Questions 4 – 11.

The Cronbach's alpha scores for the factors of Avoidance of Similarity, Unpopular Choice, and Creative Choice in the Knight and Kim's scale were 0.70, 0.62, and 0.71, respectively. The internal reliability in the factor of Unpopular Choice factor was low, which in the opinion of the researchers may be caused by the word "unusual" in two questions. Some respondents might have perceived "unusual" as a positive word but others might have considered it as a word that has a negative meaning. For this reason, the researcher made the following changes: "unusual" was replaced by "distinct" in Question 9 and was replaced by "unique" in Question 10. In addition, three questions, Question 4, 10 and 11, were reworded so that they were more focused on "clothing," and thus, "products," "fashion," or "thing" were reworded as "clothing". The term "brand" was also changed to "clothing" or "clothing design" because brand was not the focus of the current study (Questions 5 - 9). After the eight closed-end multiple choice questions measuring uniqueness seeking, an open-ended question (Question 12), "Please

1 **Table 4.4 Measures of Benefits Sought Including Uniqueness Seeking, Fit Seeking, and Deal Seeking**

Variable	Sources of Reference	Factor Name in the Original Scale	Original Items	Items in the Final Questionnaire	Q #
Uniqueness seeking	Adapted from Knight & Kim (2007)	Unpopular choice	I look for one-of-a-kind products to create my own style.	I look for unique clothing to create my own style.	4
			I buy unusual brands to create a more distinctive personal image.	I buy clothing that can create a more distinctive personal image.	9
			The thing that I buy shapes a more unusual personal image.	The clothing that I buy shapes my unique identity.	11
		Avoidance of similarity	I dislike brands bought by everyone.	I dislike clothing designs bought by everyone.	5
			When a clothing brand becomes too popular, I wear it less.	When a clothing design becomes too popular, I buy it less.	8
			I stop wearing fashions when they become popular with the general public.	I do not buy clothing when I see similar clothing is worn by almost everyone.	10
		Creative choice	The brands that I like best are the ones that express my individuality.	The clothing that I like best are the ones that express my individuality.	6
			An important goal is to find a brand that communicates my uniqueness.	When buying clothing, an important goal is to find a design that communicates my uniqueness.	7
Fit Seeking	Developed by the researcher based on five previous study results	N/A	N/A	When shopping for clothing, I always try on clothes to make sure that I find the best fit.	13
				When I purchase clothing, fit, and not any other aspects such as design, material, workmanship, or price, is the most important criterion.	14
				Wearing clothes that fit my body perfectly is extremely crucial to me.	15
				It is difficult to find clothing that fits my body well.	16
Deal Seeking	Adapted from Jin, Sternquist, & Koh (2003)	Price-quality schema	Generally speaking, the higher the price of a product, the higher the quality.	There is absolutely no relationship between the price of clothing and the satisfaction that I get from the product.	18
			You always have to pay a bit more for the best.	When purchasing clothing, I pay more for the best.	20
			The price of a product is a good indicator of its quality.	The price of clothing is a good indicator of its quality.	22
		Sale proneness	Compared to most people, I am more likely to buy brands that are on special.	Compared to most people, I buy clothing that is on sale more frequently.	19
			I am more likely to buy brands on sale.	I almost always buy only the clothing that is on sale.	21
	Developed by the researcher	N/A	N/A	I am willing to pay extra for clothing that I desire.	23
Open-ended question	Developed by the researcher			Please provide some reasons why you answered the way you did from questions __ to ___.	12, 17, 24

provide some reasons why you answered the way you did from questions 4 to 11" was included to better understand the respondents' reasons for their answers.

Based on the results of the pilot test, several revisions were made for the questions. In three questions, more than 75% of the respondents expressed that they either disagreed or strongly disagreed to the statements. According to De Vaus (2002), a useful question should have the ability to discriminate. Therefore, these three questions were revised to decrease the possibility of obtaining the same responses. In Question 4, "I look for one-of-a-kind apparel products to create my own style", the word "one-of-a-kind" might have been semantically too extreme to describe uniqueness, and thus, it was changed to "unique". The question became "I look for unique clothing to create my own style" (See Table 4.4). Another question (Question 8), "When a clothing designs becomes too popular, I wear it less" was modified to "When a clothing designs becomes too popular, I buy it less" because the respondents' feedback from the pilot test showed that they may not discard or stop wearing the clothing solely due to an increase in popularity of the design but they may rather stop buying the clothing if the design becomes too popular. Similarly, the other question (Question 10), "I stop wearing the clothing when the design of it becomes popular with the general public" was also changed from "stop wearing" to "do not buy." In addition, to avoid using the same word "popular" repeatedly in Questions 8 and 10, the wording of Question 10 was modified to "I do not buy the clothing when I see similar clothing is worn by almost everyone."

Fit seeking. In the current study, fit was defined as a consumer's behavior to look for apparel products that conform correctly to the shape or size of the consumer's body. The development of the above definition was explained in the operational definition section of Chapter 1. Although fit is widely discussed in the apparel literature, the concept of consumers' fit seeking has received limited study. Due to a lack of studies where there is a measurement of consumers' fit seeking, no questions were available for adoption into the study. Four questions (Question 13-16) developed by the researcher are listed in Table 4.4. These questions were developed based on the findings of previous studies, which reported that many consumers were not satisfied with the fit of ready-to-wear garments (Alexander et al., 2005; De Klerk & Tselepis, 2007; Endo & Kincade, 2005; Kinley, 2003; Pisut & Connell, 2007; Workman & Lentz, 2000) and that they desired a better fit (Fiore et al., 2003). After the four, closed-ended, multiple choice questions measuring fit seeking, an open-ended question (Question 17), "Please provide some

reasons why you answered the way you did from questions 13 to 16" was included to better understand the respondents' reasons for their answers.

Deal seeking. The definition of deal seeking in this study is a consumer's behavior to look for good bargains in apparel products and is based on the information from Arnould et al., (2002). Arnould et al. provided bases for the definition of deal seeking. However, the measurements of deal seeking were not available in the study. Therefore, the questions in Jin et al.'s (2003) multidimensional price cues scale were adapted for the current study. Jin et al. developed a total of 16 questions in the original scale, and their results revealed seven factors (i.e. price-quality schema, prestige sensitivity, sale proneness, price mavenism, value consciousness, price consciousness, coupon proneness). Among the seven factors, the questions in the two factors (i.e. price-quality schema, sale proneness) were used for the current study because the questions in these two factors were most closely related to the definition of deal seeking in the current study. Therefore, the three questions in the factor of price-quality schema and the two questions in the factor of sale proneness were adapted in the current study. Table 4.4 shows the items of these five original items from Jin et al.'s scale in Questions no. 18-23. The Cronbach's alpha of the three questions measuring the original price-quality schema factor was 0.92, and the two questions measuring the original sale proneness factor was 0.84.

To make the items from Jin et al. (2003) suitable for measuring apparel shopping behavior, some wordings in the original questions were changed. Similar to the changes in the questions for uniqueness seeking, the questions were reworded so that they were more focused on "clothing" (Questions 20 & 22). The term "brand" was changed to "clothing" because brand was not the focus of the current study (Questions 19 & 21). To avoid using the word "quality" repeatedly in Questions 18 and 22, the word "quality" in the original Question 18 was replaced by "satisfaction I can get from the product" in order to measure how consumers perceive the relationship between the price of an apparel product and the overall post-purchase satisfaction.

The pilot tests showed that 92% of the respondents disagreed or strongly disagreed to the statement "The higher the price of an apparel product, the higher the satisfaction I can get from the product" (Question 18). Almost all respondents in the pilot test did not believe that a relationship between price and satisfaction existed, and therefore, the question was changed from indicating a positive relationship between price and satisfaction to no relationship between price and satisfaction. The question was changed to "There is absolutely no relationship between the

price of clothing and the satisfaction that I get from the product." Similarly, more than 95% of the participants agreed or strongly agreed to the statement "I am more likely to buy the clothing that is on sale" (Question 21), indicating that this item did not successfully examine the diversity of views on a subject (De Vaus, 2002). Therefore, it was modified to "I almost always buy only the clothing that is on sale" in order to make it semantically more extreme.

In addition to the five questions adapted from Jin et al., one question (Question 23) was developed by the researcher (i.e., I am willing to pay extra for apparel products that I desire.), considering the nature of mass-customization that customers need to pay extra money (i.e., premium) to purchase mass-customized apparel (Bardakci & Whitelock, 2004; Radder & Louw, 1999) and regarding the result of a previous study that paying premium was one of the consumers' concerns in adopting apparel mass-customization (Kamali & Loker, 2002).

Lastly, after the six closed-ended multiple choice questions measuring deal seeking, an open-ended question (Question 24), "Please provide some reasons why you answered the way you did from questions 18 to 23" was included to better understand the respondents' reasons for their answers.

Measures of Innovativeness

In this section, the measures of the second independent variable, innovativeness, were discussed. Innovativeness in the current study was defined as "the degree to which an individual is receptive to new ideas" (Midgely & Dowling, 1978, p. 236). Two types of innovativeness, fashion innovativeness and technology innovativeness, were included.

Fashion innovativeness. The operational definition of fashion innovativeness in this study is the degree to which an individual is receptive to new apparel designs or styles and his/her willingness to buy and wear new apparel products (Midgley & Dowling, 1978). Midgley and Dowling's definition of innovativeness was used for the base of the definition of fashion innovativeness in this study. However, they did not include a fashion innovativeness scale. Thus, the fashion innovativeness scales from Park et al. (2007) and Chen-Yu (1995) were adapted for the current study. Park, et al. adapted the six-item Domain Specific Innovativeness Scale developed by Goldsmith and Hofacker (1991). Both Goldsmith and Hofacker, and Park et al. discussed Midgley and Dowling's definition of innovativeness. Goldsmith and Hofacker's Domain Specific Innovativeness scale was not specific to fashion but Park et al. modified

Goldsmith and Hofacker's scale to reflect female fashion consumer behavior. Therefore, there was a consistency in the concept included in the operational definition of fashion innovativeness and measures of fashion innovativeness. Among Park et al.'s six items, only three of the six items were used in the current study because the remaining three questions did not measure typical male consumer behavior. As an example, the statement "I know the names of new fashion designers before others do" may be more pertinent to female fashion consumer behavior, but may not be suitable for measuring male consumers' fashion innovativeness. This assumption was made based on Beaudoin, Lachance, and Robitaille's (2003) study result that there was a difference in fashion adoptiveness between female and male consumers. More female than male consumers were in innovators and early adopters categories, while there were more male than female consumers in the categories of late majority and laggards. Consumer behavior such as knowing the names of new fashion designers may apply largely to the innovators and early adopters instead of late majority and laggards, and thus, these questions were expected to have a lower validity in measuring males fashion innovativeness.

The three questions from Park, et al. (2007) (Questions 25, 27 and 29) are listed in Table 4.5. Two of the three selected questions (Questions 25 and 27) were reverse-coded in the original study, but were modified to non-reverse coded questions, in order to provide consistency and to determine the overall score by obtaining the average (De Coster, 2004). For example, the original statement in Question 25, "In general, I am the last in my circle of friends to know the latest new fashions" was first modified to "I am among the first in my circle of friends to know the latest new fashions." However, the results of the pilot tests showed that 83% of the respondents either disagreed or strongly disagreed to this statement. Therefore, based on De Vaus's (2002) argument that one of the purposes of conducting a survey research is to examine various answers, the question was further modified to "I tend to know more about the current fashion trends, compared to my circle of friends."

The other three questions (Questions 26, 28, and 30) that were used to measure fashion innovativeness were adapted from Chen-Yu (1995). The concepts of fashion innovativeness in Chen-Yu's measures were consistent with the concept in the operational definition of fashion innovativeness used in the current study. However, Chen-Yu's scale pertained to the fashion innovativeness of sweatshirt consumers. To make the questions better-suited for this study, sweatshirt-specific questions were modified to measure fashion innovativeness in purchasing

Table 4.5 Measures of Innovativeness

Variable	Sources of Reference	Original Items	Items in the Final Questionnaire	Q #
Fashion Innovativeness	Adapted from Park et al. (2007)	In general, I am the last in my circle of friends to know the names of the latest new fashions.	I tend to know more about the current fashion trends, compared to my circle of friends.	25
		In general, I am among the last in my circle of friends to buy a new fashion item when it appears.	I tend to by new arrivals of clothing.	27
		Compared to my friends, I own few new items.	Compared to my friends, I own more fashionable clothing	29
	Adapted from Chen-Yu (1995)	I wear the clothing that is compatible with the latest fashion designs.	I wear the clothing that is compatible with the latest fashion designs.	26
		I enjoy knowing fashion trends.	I enjoy knowing fashion trends.	28
		When I buy clothing, I consider myself to be fashion-conscious.	When I buy clothing, I consider myself to be fashion-conscious.	30
Technology Innovativeness	Adapted from Kim & Forsythe (2008)	If I heard about new technology, I would look for ways to experiment with it.	When I hear about new technology, I look for ways to know more about it.	31
		Among my peers, I am usually the first to try out new technologies.	I am among the first to try new technologies.	32
		I like to experiment with new technologies.	I like to experiment with new technologies.	33
	Developed by the researcher based on Kim & Forsythe (2008)	I like to experiment with new technologies.	I like to experiment with the interactive communication technology through the Web (e.g. real-time online communication with a manufacturer or a retailer).	34
		I like to experiment with new technologies.	I like to experiment with Internet technology that visualizes a company's product designs and options.	35

general apparel products. An example of the questions was "When buying clothing, I consider myself to be fashion-conscious."

Technology innovativeness. Technology Innovativeness is an individual's degree of receptiveness to new technology and a tendency to be the first using new technologies. This definition was developed by the researcher based on Rogers' (1983) and Midgley and Dowling's (1978) definitions of innovativeness. However, the authors of these studies did not provide measurements of innovativeness. The three-item measures from Kim and Forsythe (2008) were adapted to measure consumers' technology innovativeness because the concept in Kim and Forsythe's measures was consistent with the concept in Midgley and Dowling's definition. The Cronbach's alpha of their three-item measurement was reported to be greater than 0.8. These

three questions were listed on Table 4.5 in Questions 31-33. The wording in Question 31, "If I heard about new technology, I would look for ways to experiment with it" used an "if" sentence structure to indicate a conditional situation, which is different from the other two questions. To keep the consistency in wording, this question was modified to "When I hear about new technology, I look for ways to experiment with it." The respondents of the pilot tests indicated that the wording in Question 31 and 33 were similar. To avoid the repetition of the word "experiment", the original statement of Question 31, "When I hear about new technology, I look for ways to experiment with it" was modified to "When I hear about new technology, I look for ways to learn more about it."

Based on one of the three questions from Kim and Forsythe (2008) [i.e. I like to experiment with new technologies (Question 33)], two more questions were developed by the researcher to further measure consumers' innovativeness in using technologies in apparel mass-customization such as visualization of the product designs that the company offered and the options that have been chosen by the customer, and interactive online communication (e.g., real-time online communication with a manufacturer or a retailer).

Part III: Mediating Variables

The mediating variables in the current study were perceived usefulness, perceived behavioral control, which consist of two variables, self-efficacy and facilitating conditions. Some respondents of the current study might not have had an experience in using apparel mass-customization, and thus, might not have known what apparel mass-customization was. To help the respondents understand the concept and the process of apparel mass-customization before the mediating variables were measured, the definitions, examples, and pictures of apparel mass-customization, design mass-customization, fit mass-customization, and personalization mass-customization were provided. There were several reasons why examples and pictures were used instead of using a virtual website that simulates the apparel mass-customization process. Different from an experimental design, in a survey design study, the researcher could not control whether the respondents would actually access to the virtual website. In addition, the respondents' perception of the virtual website might significantly influence their perceptions of apparel mass-customization. The respondents might answer whether they like to use apparel mass-customization based on how much they liked the design or the quality of the virtual

website. Furthermore, using a virtual website would limit the respondents' perception of apparel mass-customization only to an online mass-customization when other distribution channels (e.g. catalogues, brick-and-mortar stores) can also be used for purchasing mass-customized apparel.

In the survey, apparel mass-customization was defined as the production of individually customized apparel by using flexible processes and organizational structures at the low cost of a standardized mass-production system (Hart, 1995). Design mass-customization was defined as a type of apparel mass-customization, which allows consumers to select their own style, fabric, or color preferences (Burns & Bryant, 2005, p. 435). Pictures of various types of collar, pocket and cuff options shown in Figure 4.3 as examples of design mass-customization and they were presented after the definition of design mass-customization. The pictures were adopted from www.raresplendors.com. Permission for using the pictures was granted from the company before the pictures were included in the current chapter and in the questionnaire. Fit mass-customization was defined as a type of apparel mass-customization, which allows consumers to provide one to a few of their body measurements to the manufacturer to produce a garment that specifically fits the consumer's body (Burns & Bryant, 2005). The example given was as follows: you may measure your neck circumference, sleeve length, and upper body length, according to the instructions stated by the apparel company, and then, provide the body measurements to the manufacturer so that it can make a dress shirt just for you. You may also indicate your fit preference such as tailored fit or loose fit.

Personalization mass-customization was defined as a type of apparel mass-customization, which allows consumers to add personalized details such as a monogram, personal embroidery, laser stitching, and fabric ornamentation to the purchased item (Burns & Bryant, 2005). An example provided was as follows: You can have your initials monogrammed on the pocket or on the cuff of the dress shirt. Then, pictures of different font types/styles that can be used in monogramming a dress shirt were presented. (See Figure 4.4)

Once the respondent read the definitions and examples of apparel mass-customization, he answered the questions related to perceived usefulness of apparel mass-customization of dress shirts, perceived behavioral control in apparel mass-customization, attitude toward using apparel mass-customization of dress shirts, and purchase intention for mass-customized dress shirts.
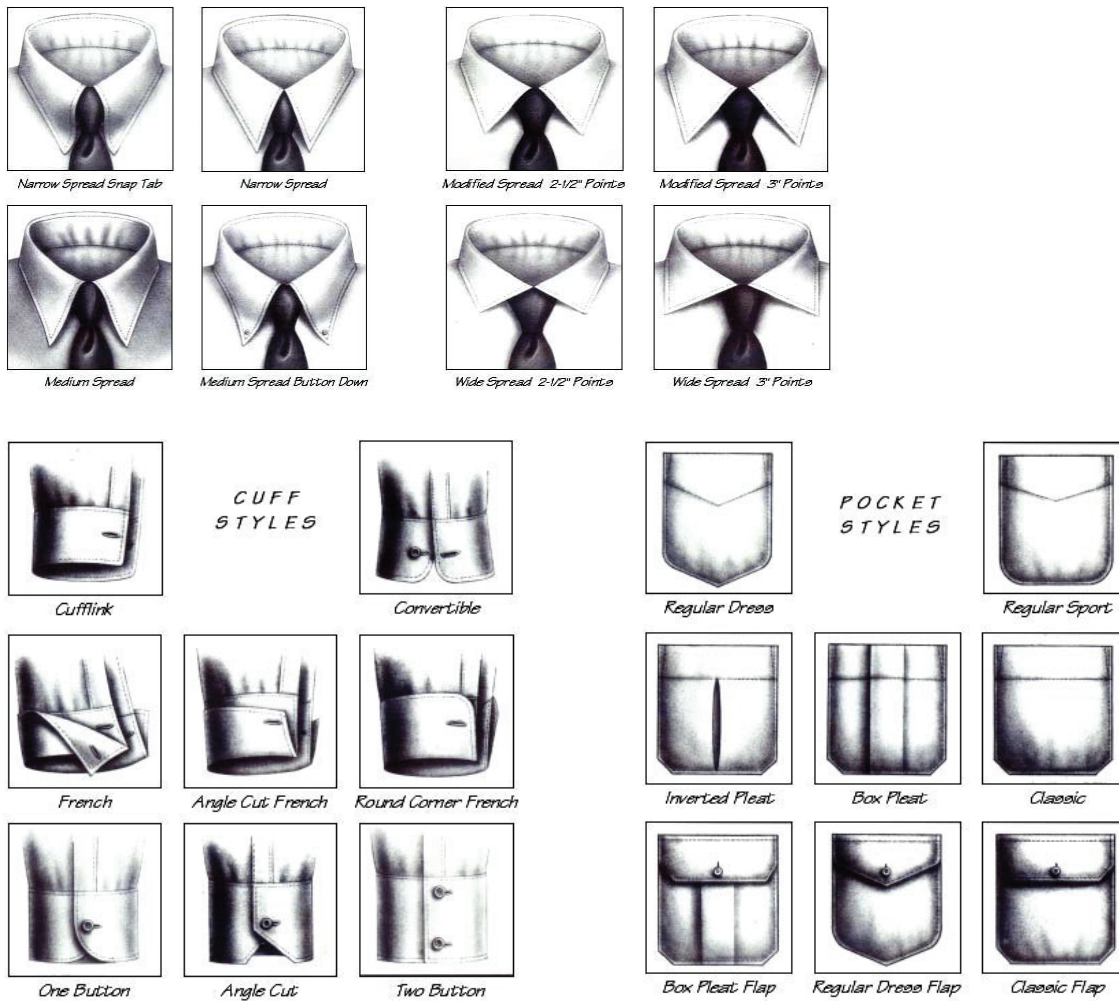
Figure. 4.3 Dress Shirt Collar, Cuff, and Pocket Options (Pictures from www.Raresplendors.com. Copyright ©)
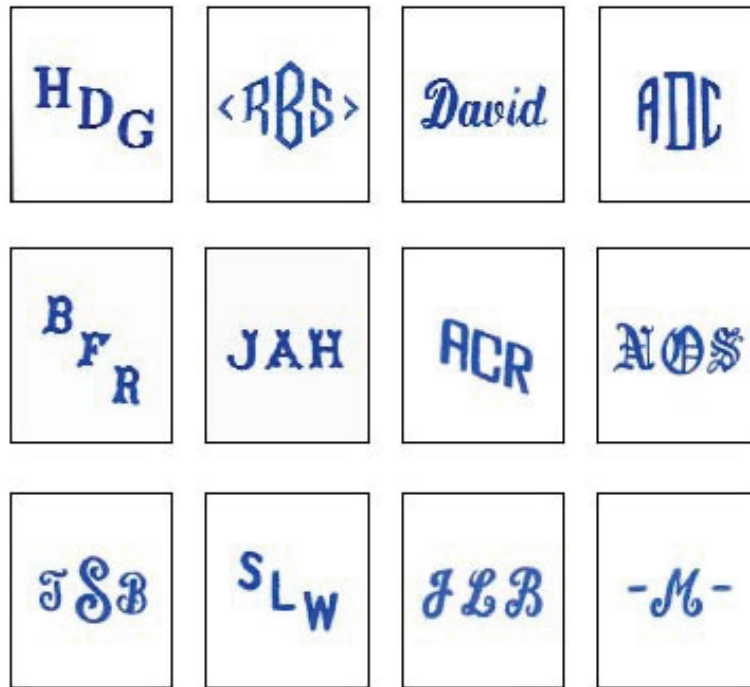
Figure 4.4 Example of Dress Shirt Monogramming Personalization (Pictures from www.Raresplendors.com. Copyright ©)

Measures of Perceived Usefulness

 The operational definition of perceived usefulness of apparel mass-customization in this study was the consumer's subjective opinion that using mass-customization in apparel shopping may be useful for him. This definition was based on Davis' (1989) definition of perceived usefulness of a new technology in his Technology Acceptance Model. Davis used six items to measure perceived usefulness of new technology, and the Cronbach's alpha of the six items was 0.98. Davis et al. (1989) selected four items from Davis' measures and successfully measured perceived usefulness without sacrificing Cronbach's alpha. The Cronbach's alpha of their four-item scale was 0.97. Three items from Davis et al. were adapted in the current study, which are listed on Table 4.6 in Questions 36-38. One question in Davis et al.'s scale, "Using WriteOne program in the MBA program would increase my productivity" was eliminated because this question measured the perception of usefulness of using a software program to increase productivity. One important element of productivity was the amount of produced output in a given time but this concept of productivity does not apply to the situation of and efficiency in

shopping apparel. Efficient apparel shopping is not necessarily measured by how many apparel products are purchased in a given time, and thus, this question was not selected.

Table 4.6 Measures of Perceived Usefulness of Apparel Mass-customization

Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Adapted from Davis et al. (1989)	I find (system) useful in my (task completion).	Apparel mass-customization is extremely useful to me when buying dress shirts that I want.	36
	Using (system) as a (technology type) enables me to (accomplish tasks) more quickly.	Apparel mass-customization can save me time in getting dress shirts that I want.	37
	Using (system) enhances my effectiveness in (accomplishing task).	Using apparel mass-customization is the most effective way to buy dress shirts.	38
Developed by the researchers based on Davis et al. (1989)	N/A	Design mass-customization is the best way to buy dress shirts that have the design that I specifically want.	39
		Fit mass-customization is the best way to buy dress shirts that fit my body	40
		Personalization mass-customization (e.g. monogramming initials on a pocket or on a cuff) is the best way to buy dress shirts with a personal touch.	41
Open-ended question	N/A	Please provide some reasons why you answered the way you did from Questions 36 to 41.	42

To better reflect the apparel shopping situation, the original statement in Question 36, "I find (system) useful in my (task completion)" was modified by replacing the word "system" with "apparel mass customization" and replacing "in my (task completion)" with "buying dress shirts that I want" and was written as "Apparel mass-customization is useful to me when buying dress shirts that I want." However, 76% of the respondents strongly agreed or agreed to the statement. Based on De Vaus's (2002) argument that one of the purposes of conducting a survey research is to examine the variation among the survey responses, and thus, the word "extremely" was added. The revised statement was "Apparel mass-customization is extremely useful to me when buying dress shirts that I want."

The original statement in Question 37, "Using (system) as a (technology type) enables me to (accomplish tasks) more quickly" was modified to "Apparel mass-customization can save me time in getting dress shirts that I want" because efficiency when shopping for apparel does not mean that the shopping process has to be completed quickly but it means saving time to find the product that the consumer needed or wanted.

To better reflect the apparel shopping situation, the original statement in Question 38 "Using (system) enhances my effectiveness in (accomplishing task)" was modified to "Using mass-customization is an effective way to buy dress shirts." However, the results of the pilot test showed that 83% of the respondents agreed or strongly agreed to the question. To examine the variation among the responses based on De Vaus (2002), the wording "an effective way" was modified to "the most effective way."

In addition to the three questions adapted from Davis et al. (1989), three more questions, Questions 39-41, were developed by the researchers to measure the perceived usefulness of each type of apparel mass-customization (i.e. design mass-customization, fit mass-customization, personalization mass-customization). An example of the questions is "Design mass-customization is the best way to buy dress shirts that have the design that I specifically want. (Question 40).

Lastly, an open-ended question "Please provide some answers why you answered the way you did from questions 36 to 41" (Question 42) was included to better understand the reasons for selecting their answers.

<u>Measures of Perceived Behavioral Control</u>

The measures of perceived behavioral control included the measures of self-efficacy and facilitating conditions, which are discussed in the following sections.

<u>Measures of self-efficacy.</u> The operational definition of self-efficacy in this study was an individual's self-confidence in his or her ability to use mass-customization in apparel shopping. This definition was based on the definition of self-efficacy from Taylor and Todd (1995). Taylor and Todd used a six-item scale to measure self-efficacy in buying and operating a video recording technology of VCR-Plus. In the current study, three of Taylor and Todd's items were selected, and are listed on Table 4.7, in Questions 43 – 45. The other three questions of Taylor and Todd's items were eliminated because the questions measured whether the confidence of having the ability to perform a task is "important" to the respondent or not, which is inconsistent with the definition of self-efficacy in the current study. In the current study, self-efficacy is the "degree" of confidence in using mass-customization in apparel shopping.

Table 4.7 Measures of Perceived Behavioral Control and Premium Willing to Pay

Variable	Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Self-efficacy	Adapted from Taylor & Todd (1995)	If I wanted to, I could easily operate a (VCR-Plus) on my own.	If I wanted to use apparel mass-customization to buy dress shirt, the process would be easy.	43
		I know enough to buy a (VCR-Plus) on my own.	I know enough to use apparel mass-customization to buy a dress shirt.	44
		I would feel comfortable buying a (VCR-Plus) on my own.	I would feel comfortable using apparel mass-customization to buy a dress shirt.	45
	Developed by the researcher based on the conceptual definition of self-efficacy	N/A	I would feel confident in providing information to the manufacturer when using design mass-customization to buy a dress shirt.	46
			I would be confident in following instructions to take my body measurements when using fit mass-customization to buy a dress shirt.	47
			I would feel confident in making a decision when using personalization mass-customization to buy a dress shirt.	48
Facilitating Conditions	Developed by the researcher based on Taylor & Todd (1995)	I have time and money needed to buy a (VCR Plus).	I have time to use apparel mass-customization option to buy a dress shirt.	49
			I have time to use design mass-customization to buy a dress shirt	50
			I have time to use fit mass-customization to buy a dress shirt.	51
			I have time to use personalization mass-customization to buy a dress shirt.	52
			I have money to pay the premium of design-customized dress shirts.	71
			I have money to pay the premium of fit mass-customized dress shirts.	74
			I have money to pay the premium of personalized (e.g. monogrammed) mass-customized dress shirts.	77
			I have money to pay the premium of mass-customized dress shirts in general.	80
Premium Willing to Pay	Developed by the researcher	N/A	How much do you normally pay for a ready-to-wear dress shirt, in a dollar ($) amount?	69
			Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you just wrote down for question 69, how much are you willing to pay for a design mass-customized dress shirt, in a dollar ($) amount?	70
			Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you just wrote down for question 69, how much are you willing to pay for a fit mass-customized dress shirt, in a dollar ($) amount?	73
			Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you just wrote down for question 69, how much are you willing to pay for a personalized dress shirt, in a dollar ($) amount?	76
			Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you just wrote down for question 69, how much are you willing to pay for a mass-customized dress shirt in general, in a dollar ($) amount?	79

The three selected questions from Taylor and Todd (1995) were modified to measure the self-efficacy in using mass-customization to purchase a dress shirt by replacing "buying VCR-Plus" with "using apparel mass-customization to buy a dress shirt" in Questions 43 - 45, in order to make the items more suitable to this study. For example, "I know enough to buy VCR Plus (a technologically innovative device) on my own" was changed to "I know enough to use apparel mass-customization to buy a dress shirt" (Question 44).

In addition to the three questions adapted from Taylor and Todd (1995), three more questions were developed by the researcher to measure respondents' confidence in providing information about specific design features for design mass-customization, in taking body measurements for fit mass-customization, and in making the decision in using personalization mass-customization. These three questions regarding the three specific types of apparel mass-customization were based on the conceptual definition of self-efficacy (i.e. an individual's self-confidence in his or her ability to use mass-customization in apparel shopping). An example of the questions is "I would be confident in following instructions to take my body measurements when using fit mass-customization to buy a dress shirt" (Question 47).

Measures of facilitating conditions. The operational definition of facilitating conditions in this study was a consumer's beliefs on whether or not he or she has access to the resources and opportunities needed to use mass-customization in apparel shopping. This definition was based on Taylor and Todd's (1995) definition of facilitating conditions. Taylor and Todd measured facilitating conditions with 10 items. However, only one item "I have the time and money needed to buy a VCR-Plus" was used as the base to develop the measures of facilitating conditions in using apparel mass-customization in the current study. The other nine items measured either the compatibility with an existing system or the level of "importance" of having time and money to buy a product or the facilitating conditions regarding post-purchase behavior, which were not related to the current study. The one item adapted from Taylor and Todd combined the measures of "time" and "money" needed to buy a product in one question, which made the item a double-barreled question (Zikmund, 2003). A respondent might have the time but might not have the money, or vice versa, and therefore, separate questions were developed to measure time and money.

A total of eight questions were developed to measure facilitating conditions in using apparel mass-customization. Four questions measured the time availability for using apparel

mass-customization in general and for the three specific types of apparel mass-customization (i.e., design mass-customization, fit mass-customization, personalization mass-customization), which are listed on Table 4.7, in Questions 49-52. An example of the questions was "I have time to use apparel mass-customization option to buy a dress shirt" (Question 49). The other four questions were developed to measure if the participants perceived that they had money to pay the premium for mass-customized dress shirts in general and for the three specific types of apparel mass-customization (i.e., design mass-customization, fit mass-customization, personalization mass-customization), which are listed on Table 4.7, in Questions 71, 74, 77 and 80. An example of the questions was "I have money to pay the premium of mass-customized dress shirts in general" (Question 80).

Measures of premium willing to pay. To further understand the price that the respondents' were willing to pay for a mass-customized dress shirt, questions were asked to measure how much extra money the respondents were willing to pay, compared to the price they normally paid for a ready-to-wear dress shirt. To obtain a base for comparison, the respondents were first asked "How much do you normally pay for a ready-to-wear dress shirt?" (Question 69). They were then asked "Compared to the dollar amount you normally pay for a ready-to-wear dress shirt that you just wrote down for Q#69, how much are you willing to pay for a design mass-customized dress shirt, in a ($) amount?" (Question 70). In the same way, the respondents were asked the price they were willing to pay for a fit mass-customized dress shirt (Question 73), for personalization mass-customized dress shirt (Question 76), and for mass-customized dress shirt in general (Question 79), compared to the dollar amount they normally paid for a ready-to-wear dress shirt that they answered for Question 69.

Measures of Attitude toward Using Apparel Mass-customization

The operational definition of attitude toward using apparel mass-customization in this study was an individual's consistently favorable or unfavorable response with respect to using apparel mass-customization as a way of shopping apparel. The definition was developed based on Fishbein and Ajzen's (1975) definition of attitude. Fishbein and Ajzen provided a theoretical base for developing the conceptual definition of attitude toward using apparel mass-customization. However, they did not present a scale that could be used to measure attitude, specifically related to apparel consumers. Therefore, in the current study, Park et al.'s (2007)

semantic differential scale was adapted because Park et al.'s scale measured the attitude toward purchasing foreign fashion goods online, which was more specific to apparel consumer behavior. Park, et al. developed four pairs of evaluative semantic differential adjectives to measure the attitude toward purchasing foreign fashion goods online (i.e., good to bad, pleasant to unpleasant, rewarding to punishing, beneficial to harmful) based on the suggestions from Ajzen and Fishbein (1980), in which, the same definition of attitude as that in Fishbein and Ajzen (1975) was provided. Therefore, the concept of attitude in Fishbein and Ajzen's definition and in Park et al.'s measures was consistent. According to Cozby (2007), using the same rating scale increases the consistency in measuring different variables. Therefore, the words on the positive side of the response scale of the Park et al. were used to develop statements in a Likert-type scale format to measure the respondents' attitudes toward using apparel mass-customization. For example, one of the response scale from Park et al. was "bad-good". Based on the positive end of the response scale, "good", a statement, "Using mass-customization in shopping for dress shirts is a good idea" was developed and was used in the pilot test. Four questions, Questions 54-57, were developed to measure overall attitude toward using apparel mass-customization (See Table 4.8).

Table 4.8 Measures of Attitude toward Using Apparel Mass-customization

Sources of Reference	Original Semantic Differential Scale	Questions in the Final Questionnaire	Q #
Developed by the researcher based on Park, et al.'s (2007) semantic differential scale	Good-Bad	It is a very good idea to use mass-customization when shopping for dress shirts.	54
	Rewarding- Punishing	I will find it very rewarding to use mass-customization when shopping for dress shirts.	55
	Pleasant- Unpleasant	I would find using mass-customization a very enjoyable way to shop for dress shirts.	56
	Beneficial- Harmful	Using mass-customization to shop for dress shirts is very beneficial.	57
	Good-Bad	It is a very good idea to use design mass-customization when shopping for dress shirts.	58
		It is a very good idea to use fit mass-customization when shopping for dress shirts.	59
		It is a very good idea to use fit mass-customization when shopping for dress shirts.	60
An open-ended question developed by the researcher	N/A	Please provide some reasons why you answered the way you did from Questions 54 to 60.	61

To measure the respondents' attitudes toward using the three specific types of apparel mass-customization (i.e. design mass-customization, fit mass-customization, personalization mass-customization), three additional questions, Questions 58-60, were developed based on one of the questions measuring overall attitude toward using apparel mass-customization [i.e. It is a good idea to use apparel mass-customization when shopping for dress shirt (Question 54)]. A sample of the questions measuring attitude toward using the three types of apparel mass-customization was "It is a good idea to use fit mass-customization when shopping for dress shirts" (Question 59).

Lastly, after seven closed-ended multiple choice questions from Questions 54 to 60, an open-ended question was included to ask the respondents the reasons why they answered the way they did for the questions regarding attitude toward using apparel mass-customization (Question 61).

The results of the pilot tests showed that more than 75% of the respondents either strongly agreed or agreed to the statements in all seven questions. Based on the argument of De Vaus (2002) that it is necessary to examine the variation among survey responses, the word "very" was added in each question to make the statements semantically stronger so that the respondents can express various degrees of their attitude toward using apparel mass-customization. For example, in Question 54, the statement included in the pilot test was "It is a good idea to use apparel mass-customization when shopping for dress shirt." After the modification, the statement "It is a very good idea to use mass-customization when shopping for dress shirts" was used in the final questionnaire.

Part IV. Dependent Variable – Purchase Intention for Mass-customized Apparel

The dependent variable in the current study is purchase intention for mass-customized apparel. The operational definition of purchase intention in this study was a person's subjective probability of purchasing the mass-customized product. Fishbein and Ajzen (1975) provided a base for developing the operational definition of purchase intention for mass-customized apparel in the current study. However, they did not provide measurements that were specific to apparel consumer behavioral intention. Therefore, Cho's (2008) measurements of purchase intention for certain brands of apparel from online were adapted to measure purchase intention for mass-customized apparel, because the concepts of purchase intention in Cho (2008) measured a

person's subjective probability of purchase, reflecting the same concept of purchase intention stated in the operational definition in the current study. The items measuring purchase intention are listed in Table 4.9. The response scale for the original questions was a four-point scale, where 1 was "very unlikely," and 4 was "very likely." The reliability of measures from Cho was a Cronbach's alpha of 0.96. To make the questions suitable for measuring a consumer's intention to purchase mass-customized apparel, the questions were modified by replacing "purchasing selected brands from online" with "purchasing a mass-customized dress shirt". In addition, in order to provide a consistency of the scales, a question format was modified to a statement format using the Likert-type scale, where 1 is "strongly agree" and 4 is "strongly disagree". Based on these modifications, three questions were developed to measure overall purchase intention for mass-customized apparel, which are listed on Table 4.9 in Questions 62-64. An example of the questions was "It is likely that I will purchase mass-customized dress shirts" (Question 62).

Table 4.9 Measures of Purchase Intention for Mass-customized Apparel

Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Adapted from Cho (2008)	How likely is it that you will purchase apparel products online of the selected brand? (1=Very unlikely, 6=Very likely).	It is likely that I will purchase mass-customized dress shirts.	62
	How likely is it that you will purchase the selected brand online the next time when you need an apparel product? (1=Very unlikely, 6= Very likely).	It is likely that I will purchase a mass-customized dress shirt next time I need a dress shirt.	63
	The probability of buying the selected brand in the future when you shop for apparel products online is (1=Very low, 6=Very high).	The probability of me buying mass-customized dress shirts in the future is high.	64
Developed by the researcher based on Cho (2008)	How likely is it that you will purchase apparel products online of the selected brand? (1=Very unlikely, 6= Very likely).	It is likely that I will purchase design mass-customized dress shirts.	65
		It is likely that I will purchase fit mass-customized dress shirts.	66
		It is likely that I will purchase personalized mass-customized dress shirts.	67
An open-ended question Developed by the researcher	N/A	Please provide some reasons why you answered the way you did from Questions 62 to 67.	68

In addition to the questions adapted from Cho (2008), three more questions, Questions 65-67, were developed by the researcher to measure the purchase intention for the three specific types of mass-customized apparel (i.e., design mass-customized dress shirts, fit mass-customized dress shirts, personalized dress shirts). These questions were developed based on one of the questions measuring overall purchase intention for mass-customized apparel, "It is likely that I will purchase mass-customized dress shirts" (Question 62). An example of the questions was "It is likely that I will purchase design mass-customized dress shirts" (Question 65). After six closed-end, multiple choice questions, an open-ended question, "Please provide some reasons why you answered the way you did from Questions 62 to 67" (Question 68) was added.

Part V. Experience

To obtain more information about the respondents, measures of their experience in purchasing mass-customized apparel was included in the questionnaire along with the questions regarding their purchase and usage of ready-to-wear dress shirts. Three questions, Questions 83-85 in Table 4.10, were included to measure the respondents' experience in purchasing ready-to-wear dress shirts and the frequency of use of ready-to-wear dress shirts. Questions 83 and 84 were modified from Cho (2008), which measured the extent of experience in online shopping. The questions were modified to measure the respondents' experience in purchasing dress shirts in terms of the frequency and the quantity of ready-to-wear dress shirts that they purchased. Question 85 was developed by the researcher to better understand the respondents' actual usage behavior of dress shirts in terms of frequency. If most of the respondents of this study did not actually wear dress shirts frequently, then they might not have a high intention to purchase ready-to-wear dress shirts and might have even less intention to purchase mass-customized dress shirts. Therefore, it is important to check the respondents' frequency of dress shirt usage so that the results and implications of the study can be meaningful. The questions asking the respondents' experience in purchasing mass-customized dress shirts were adapted from Cho's (2008) six-item scale measuring experience in online apparel shopping. Cho used three items to measure the extent of the experience in online shopping and the other three items to measure the quality of the experience. The three questions measuring the extent of the experience are listed in Table 4.11, Questions 86, 90 and 91. These questions measured the frequency of the purchase, the

number of items purchased, and the dollar ($) amount of the purchases made in the last six months.

Table 4.10 Measures of Experience in Buying and Wearing Dress shirts

Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Adapted from Cho (2008)	How often do (did) you purchase apparel products online? _____ Less than once a year _____ About once a year _____ About every 6 months _____ About every 3 months _____ About once a month _____ About twice a month _____ About once a week _____ About twice a week _____ More than twice a week	How often do (did) you purchase dress shirts? 0 - Never 1 - Less than once a year 2 – About once a year 3 - About every 6 months 4 - About every 3 months 5 - Once a month or more often	83
	How many apparel products have you purchase online in the last six months? _____ 1-2 items _____ 3-4 items _____ 5-6 items _____ 7-8 items _____ 9-10 items _____ 11 items or more	How many dress shirts have you purchased in the last 12 months? 0 - None 1 - 1-2 items 2 - 3-4 items 3 - 5-6 items 4 – 7-8 items 5 - 9 or more items	84
Developed by the researcher	N/A	How often do you wear a dress shirt? 1- Almost never 2- Less than once a month 3- About once or twice a month 4- About once a week 5- About three times a week 6- Almost every day	85

The original questions were modified so that they reflected the extent of experience in purchasing mass-customized apparel. For example, one of the original questions from Cho, "How often do (did) you purchase apparel products online?" was modified to "How often do (did) you purchase mass-customized apparel products? It can be any kind of design mass-customized clothing" (Question 86). In addition, the extent of the experience in the last 12 months was used to measure the respondents' experience in purchasing mass-customized apparel products instead of in the last six months as in Cho's scale because mass-customized apparel products were expected to be purchased less frequently, compared to ready-to-wear products. For mass-customized apparel, many respondents might not have any experience in buying mass-customized apparel or only purchased them a few times in the last six months. To measure the

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variation of experience among the respondents, the period of time given to measure the frequency of mass-customized apparel purchase was increased from six months to 12 months. In addition to the modification in wording of the questions to better suit the topic of the current study, all of the response choices from Questions 83 to 91 were changed to six-point to provide consistency in scale (Cozby, 2007). Based on Question 86, three additional questions, Questions 87-89, were developed by the researcher to examine the respondents' frequency in purchasing each type of mass-customized clothing. An example of the three questions was "How often do (did) you purchase design mass-customized clothing? It can be any kind of design mass-customized clothing" (Question 87).

The other three questions in Cho's (2008) six-item scale were related to the quality of the experience, Questions 92-94. For example, "I have enjoyed purchasing and wearing apparel products online" (See Table 4.12, Question 92). The original questions were modified to measure the respondents' experience of purchasing mass-customized apparel by replacing the phrase "purchasing apparel products online" to "purchasing mass-customized apparel". For example, the original statement in Question 92 was modified to "I have enjoyed purchasing mass-customized apparel." The word "wearing" was removed from the original statement because the scope of experience related to apparel mass-customization in the current study was limited to purchase behavior and was not extended to post-purchase behavior such as wearing the mass-customized apparel. The response format was a scale of "0" for no experience, "1" for strongly agree and "4" for strongly disagree. Lastly, an open-ended question, Question 95, was included to ask the respondents the reasons why they answered the way they did for the questions regarding the purchase and usage of dress shirts and the experience of purchasing mass-customized dress shirts.

Table 4.11 Measures of the Extent of Experience in Purchasing Mass-customized Apparel

Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Adapted from Cho (2008)	How often do (did) you purchase apparel products online? _____ Less than once a year _____ About once a year _____ About every 6 months _____ About every 3 months _____ About once a month _____ About twice a month _____ About once a week _____ About twice a week _____ More than twice a week	How often do (did) you purchase mass-customized apparel products? It can be any kind of mass-customized clothing. 0 - Never 1 - Less than once a year 2 – About once a year 3 - About every 6 months 4 - About every 3 months 5 - Once a month or more often	86
	How many apparel products have you purchase online in the last six months? _____ 1-2 items _____ 3-4 items _____ 5-6 items _____ 7-8 items _____ 9-10 items _____ 11 items or more	How many mass-customized apparel products have you purchased in the last 12 months? 0 - None 1 - 1-2 items 2 - 3-4 items 3 - 5-6 items 4 - 7-8 items 5 - 9 or more items	90
	How much have you spent on apparel products that you bought online in the last six months? _____ $1-$25 _____ $26-$50 _____ $51-$75 _____ $76-$100 _____ $101-$150 _____ $151-$200 _____ $201-$250 _____ $250-$500 _____ $501-$1,000 _____ $1,001 and more	How much in total have you spent on previous purchases of mass-customized apparel in the last 12 months? 0 - None 1 - $1-$100 2 - $101-$200 3 - $201-300 4 - $301-$400 5 - $400 or more	91
Developed by the researcher based on Cho (2008)	How often do (did) you purchase apparel products online?	How often do (did) you purchase design mass-customized apparel products? It can be any kind of design mass-customized apparel. (Options were same as Q86)	87
		How often do (did) you purchase fit mass-customized apparel products? It can be any kind of fit mass-customized apparel. (Options were same as Q86)	88
		How often do (did) you purchase personalization mass-customized apparel products? It can be any kind of personalization mass-customized apparel. (Options were same as Q86)	89

Table 4.12 Measures of the Quality of Experience in Purchasing Mass-customized Apparel

Sources of Reference	Original Items	Questions in the Final Questionnaire	Q #
Adapted from Cho (2008)	I have enjoyed purchasing and wearing apparel products online. (1= Strongly disagree/ 6= Strongly agree)	I have enjoyed purchasing mass-customized apparel. (0=No experience, 1=strongly disagree/ 4=strongly agree)	92
	Purchasing apparel products online has been a good experience. (1= Strongly disagree/ 6= Strongly agree)	Purchasing mass-customized apparel products has been a good experience. (0=No experience, 1=strongly disagree/ 4=strongly agree)	93
	I am satisfied with my experiences with buying apparel products online. (1= Strongly disagree/ 6= Strongly agree)	I am satisfied with my experiences with buying mass-customized apparel products. (0=No experience, 1=strongly disagree/ 4=strongly agree)	94
Developed by the researcher	N/A	Please provide some reasons why you answered the way you did from questions 83 to 94	95

Part VI: Demographics

The questions asking gender, age, and occupation were used as the qualifying questions at the beginning of the survey. Additional four demographic questions were included in the last part of the questionnaire (See Table 4.13). The participants were asked to indicate their educational attainment (i.e. highest education level achieved), race, annual household income, and annual clothing expenditure. In order to compare the collected data with the national population, the response categories for the items were based on the American Community Survey from the United States Census (n.d.) (www.census.gov/acs). The question measuring the respondent's annual clothing expenditure was adopted from Cho (2008).

Table 4.13 Demographics

Variables	Sources of reference	Items	Q #
Educational Attainment	American Community Survey from the U.S. Census	My highest level of education is: -Less than 9th grade -9th to 12th grade, no diploma -High school graduate -Some college but no diploma -Associate's degree, occupational -Associate's degree, academic -Bachelor's degree -Graduate or Professional degree	96
Race	American Community Survey from the U.S. Census	My race is: -American Indian or Alaska Native -Asian -Black or African American -Native Hawaiian or Other Pacific Islander -White or Caucasian -Hispanic or Latino/ Latina -Other: Please specify.	97
Annual Household Income	American Community Survey from the U.S. Census	My last year household income is approximately: -Less than $10,000 -$10,000-$14,999 -$15,000-$24,999 -$25,000-$34,999 -$35,000-$49,999 -$50,000-$74,999 -$75,000-$99,999 -$100,000-$149,999 -$150,000-$199,000 -$200,000 or more	98
Annual Clothing Expenditure	Cho (2008)	My yearly expenditure for purchasing apparel is approximately: -None -$1-$99 -$100-$199 -$200-$299 -$300-$399 -$400-$499 -$500-$599 -$600-$699 -$700-$799 -$800-$899 -$900-$999 -$1,000-$1,999 -$2000-$2,999 -$3,000-$3,999 -$4,000-$4,999 -$5,000 or more	99

Efforts in Increasing Validity and Reliability of Instrument

This section explains the efforts made to increase the validity and reliability of the measures used in the study. Measures of variables must have both validity and reliability to measure accurately (Nunally, 1978).

Validity of Instrument

Validity of a measurement instrument is defined as "the ability of an instrument to measure what it is intended to measure" (Zikmund, 2003, p. 231), which includes how well the measure captures what it is designed to measure (i.e. content validity) (Rosenthal & Rosnow, 1984) and "the degree to which evidence supports the inferences made from scores and derived from measures" (i.e., construct validity) (Hayes, 1998, p. 57).

Content validity examines the substance of the items of the scale. It reflects the degree to which the items included in the scales are representative of the variable that is intended to be measured (Hayes, 1998). To have a high content validity, the researcher needs to specify the full domain of the content that is relevant to the particular measurement situation (Carmines & Zeller, 1979).

Several efforts were made to increase the content validity of the measures in this study. First, available literature related to each variable included in the study was explored and examined thoroughly in order to understand the phenomenon. Various scales developed by the researchers of the previous studies were also collected in order to gather measures that covered the full domain of the content that is relevant to the study.

Second, after the questionnaire was developed, the questionnaire was reviewed and approved by four members of the university community who are expert in consumer research, apparel mass-customization, or statistics. They provided suggestions for improvement to ensure that the measures included in the survey were relevant to what was intended to be measured, that each question was clear and easy to understand, and that the choices in the response scale for each item were appropriate. Such improvements enabled the measures to capture what the instruments were designed to measure.

Third, before the main data collection, two pilot tests were conducted in an effort to increase the clarity of the questions included in the final questionnaire so that the measures could

capture what it was designed to measure. The respondents of the first pilot test were 42 male adult U.S. residents who were of age 20 years or older and were panel members of the marketing research firm, Market Tools. From the respondent's comments, questions that (a) the respondents did not understand, (b) were ambiguous, (c) combined two issues in a single question (i.e., double-barreled questions), and (d) were difficulty to answer, were identified and revised. In addition, if most of the respondents answered a question in one way, for example, if most of the respondents indicated that they agreed with the statement, the question was revised to be semantically more extreme to obtain various responses reflecting various opinions on the statement. After the revision, the second pilot test was conducted to examine if appropriate changes were made. A convenience sample was used to recruit 11 respondents for the second pilot test. The results from the second pilot test confirmed that the changes made based on the results from the first pilot test were appropriate. Based on the comments of the second pilot test, minor changes in wording were made to further improve the clarity of the questions, and headings were added to provide additional explanations to assist the respondents in answering the questions. For example, headings were added before the questions measuring the variables of perceived usefulness, self-efficacy, facilitating conditions, and attitude toward using apparel mass-customization, to notify the respondents that the researcher of the study was interested in knowing their opinions based on their current perception of apparel mass-customization. The two pilot tests improved the clarity of the questionnaire and the ability of the developed instrument to measure what it was designed to measure.

Construct validity is another important validity that needs to be obtained in an instrument. Construct validity refers to "the degree to which inferences can legitimately be made from the operationalizations in a study to the theoretical constructs on which those operationalizations were based" (Trochim, 2006, p.1). In other words, it refers to whether the scale measures or correlates with the concept that it purports to measure (Hayes, 1998). To increase the construct validity, the operational definition of each variable was first provided based on the previous research that dealt with the variables to present a clear concept what each variable means. During the instrument development, each item in the questionnaire was checked to ensure that there was a consistency in the concept included in the operational definition and in the measures so that the instrument correlated with what was intended to be measured. If the same study on which the definition of the variable was based provided scales to measure the variable, the scales were

adapted. If the study where the operational definition was based on did not provide relevant measure scales, efforts were made to find scales that were developed based on the original study's operational definition. If such measures could not be found, a scale measuring a similar concept to the operational definition was adapted.

Convergent validity is a type of validity that is closely related to construct validity. Convergent validity shows that the assessment is related to what it should be related theoretically. In other words, to have a high degree of convergent validity, the measures of constructs that should be theoretically related to each other are, in fact, observed to be related to each other (Trochim, 2006). Factor analysis can be useful in assessing the construct validity of empirical measures (Carmines & Zeller, 1979). To increase the convergent validity of measures in the current study, factor analyses were performed on the variables that used multiple items to measure a construct. If the results of a factor analysis showed that only one factor was extracted from all the items used to measure a variable, this result indicated that all the items of the variable were highly correlated, suggesting these items measured the same construct, achieving the convergent validity within the measures of the variable. If the item was cross loading in two or more different factors, the cross-loaded item was deleted because the cross-loaded item did not clearly measure one construct (Costello & Osborne, 2005). When a factor analysis extracted more than one factor, the items in different factors were considered to measure different constructs. Therefore, to increase the convergent validity, if the factor analysis results yielded more than one factor in a certain proposed variable, the factors revealed from the factor analysis were treated as separate variables. For example, there were two factors extracted from the variable of deal seeking (i.e. unwillingness to pay premium, sale proneness). Unwillingness to pay premium and sale proneness were treated as two separate variables.

Reliability of Instrument

Reliability of a measure instrument refers to how consistently the instrument measures the variable. Zikmund (2003) defined reliability as "the degree to which a measure is free of random error and therefore yields consistent results" (p. 231). A scale with good reliability should repeatedly and consistently measure the same construct. In order to achieve reliability, the measures must have internal consistency. Internal consistency refers to the degree to which the items in the variable are measuring the same thing (Hayes, 1998). In other words, in internal

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consistency reliability estimation, the reliability of the instrument is judged by estimating how well the items that reflect the same construct yield similar results. Cronbach's alpha is a common statistical measure of internal consistency to indicate the internal reliability of the measures. Cronbach's alpha of equal or greater than 0.6 among the items measuring the same construct is considered as good internal reliability (Moss, et al., 1998). To determine if the reliability of the measures was acceptable, Cronbach's alpha of measures was calculated for each factor in the current study, and 0.6 was used as the criterion according to Moss, et al.

Data Collection and Data Analysis

An online survey was selected as the method of data collection because apparel mass-customization in the current apparel industry is often performed through the Internet. To collect data, an electronic questionnaire was uploaded on the website of Market Tools, www.zoomerang.com. The company sent emails to its members providing a URL link for the respondent to access the online survey. Market Tools had approximately two million members. The company used incentives such as points for gift cards or for merchandise purchase to encourage U.S. residents to voluntarily sign up to become members. Members of the company received invitation e-mails from Market Tools to participate in various surveys distributed by the company. For the current study, Market Tools selected the members who met the recruitment criteria established by the researcher; male adult, age 20 years or older who held a job in either sales and office occupations or (b) managerial, professional, or related occupations. A total of 677 members accessed to the survey, but 140 were screened out because they did not meet the above criteria. Among the 537 respondents who filled out the questionnaire, 63 partially completed the survey, resulting in 474 useable responses.

Data analyses were performed with the statistical analysis program, SPSS 18.0. Frequency, percentage, mean, and standard deviation were used as descriptive statistics to examine the characteristics of the respondents. If multiple items were included to measure a variable, factor analyses were conducted to examine whether the items measured the same construct, ensuring the convergent validity. The factor analyses were performed on the items in the variables of (a) uniqueness seeking, fit seeking, and deal seeking (See Table 4.4), (b) fashion innovativeness and technology innovativeness (See Tables 4.5), (c) perceived usefulness, self-

efficacy, and facilitating conditions (See Table 4.14), and (d) attitude toward using apparel mass-customization and purchase intention for mass-customized apparel (See Table 4.15). Factors with eigenvalues greater than 1.0 and factor loading of 0.50, as suggested by Hair, Tathan, Anderson, and Black (1998), were used as the criteria for retaining items. Principal component analysis with Varimax rotation was used to simplify the factor structures by classifying the measures that belonged to one factor and to facilitate the interpretation (Catell, 1978). If an item was cross loading on more than one factor, the cross-loaded item was deleted based on Costello and Osborne's (2005) argument that it may be best to drop cross-loaded items because the cross-loaded items may be written poorly without clarity, and thus, cannot clearly measure a specific construct. In measuring the internal consistency as an aspect of reliability of the measures in each construct, Cronbach's alpha of each construct was calculated, and the value of 0.6 was used as the criterion to determine the reliability of the measures (Moss et al., 1998). If Cronbach's alpha was lower than 0.6 but higher than 0.5 for a certain construct, the construct remained in the study but the relatively low reliability would be addressed as a limitation of the study. If Cronbach's alpha was lower than 0.5, the construct would be removed from the study. The factor score was calculated and used in the hypothesis tests. The factor score was calculated by dividing the sum of the scores of the items in each factor by the number of items in the factor. All items in the factor were assumed to have equal power in measuring the construct, and thus, during the process of computation of factor scores, no weight was applied to any item.

Multiple regression analysis was used to examine the eight proposed hypotheses. A list of independent variables and the dependent variable for each hypothesis is shown in Tables 4.16 and 4.17. Multiple regression analysis was selected because it allows researchers to predict a value on a quantitatively measured criterion variable and to explain the dynamics underlying a particular construct by indicating the combined effects of two or more variables (Meyers, Gamst, & Guarino, 2006). Among many approaches of multiple regression analysis, the stepwise method was selected because it permits screening of potentially useful predictors that contribute most to the explanation of the variance of a particular dependent variable by selecting them based on R^2 (Brace, Kemp, & Snelgar, 2006; Ohring, 1972). In other words, the focus of stepwise multiple regression analysis is to identify the combination of independent variables that best predicts the dependent variable. In the process of stepwise multiple regression analysis, predictor variables are entered one at a time. The first independent variable to be entered is the one that contributes

the most to the prediction equation in terms of increasing the multiple correlation, *R*. Then, the independent variable that contributes second most to the prediction equation is entered next. If adding the variable contributes to the model, it is retained. However, all other variables in the model are then re-tested to examine if they are still contributing to the success of the model. If they no longer contribute significantly, they are eliminated. Thus, the above mentioned process of stepwise multiple regression can be viewed as a combination of forward multiple regression and backward multiple regression (Brace et al., 2006). The stepwise multiple regression method includes the smallest possible set of predictor variables in the multiple regression equation, and thus, identifies all possible predictors of a dependent variable.

Conover and Iman's (1981) study showed that it is appropriate to use the parametric procedure to analyze data measured by an ordinal rank scale. Demographic variables, such as age, educational attainment, annual household income, and annual clothing expenditure, were measured with ordinal scales in rank, and thus, were included in the multiple regression analyses.

Tolerance and Variance Inflation Factor (VIF) were two measures used to examine if high multicollinearity existed among the variables included in the regression model (Slinker & Glantz, 1985). Multicollinearity occurs when two or more predictor variables were highly correlated in the same regression model. When multicollinearity exists, it decreases the capability of the regression model to identify significant predictors within the regression model. For example, if two highly correlated predictor variables are included in a regression model, neither of the two variables contributes significantly to the model but together they may contribute significantly in the regression model (Motulsky, 2002). Therefore, for the current study, Tolerance and VIF were calculated to examine if high multicollinearity existed among the variables included in the regression model. According to Belsley, Kuh, and Welsch (1980), if Tolerance is greater than 0.1 and VIF is smaller than 10, the correlation between variables is considered to be low enough to avoid the situation of including highly correlated variables in the regression equation. Tolerance and VIF were calculated; Tolerance greater than 0.1 and VIF smaller than 10 were used as the criteria to examine if high multicollinearity existed among the variables included in the regression model.

A significant level of 0.05 was used to determine if the hypotheses were supported. When the obtained *p*-value was less than 0.05, the tested relationship between the variables was

considered to be statistically significant. If the *p*-value was greater than 0.05, the relationship between the variables was not considered to be significant.

Table 4.14. Items in Perceived Usefulness, Self-efficacy and Facilitating Conditions for Conducting Factor Analyses

Variable	Questions in the Final Questionnaire	Q #
Perceived Usefulness	Apparel mass-customization is extremely useful to me when buying dress shirts that I want.	36
	Apparel mass-customization can save me time in getting dress shirts that I want.	37
	Using apparel mass-customization is the most effective way to buy dress shirts.	38
Self-efficacy	If I wanted to use apparel mass-customization to buy dress shirt, the process would be easy.	43
	I know enough to use apparel mass-customization to buy a dress shirt.	44
	I would feel comfortable using apparel mass-customization to buy a dress shirt.	45
Facilitating Conditions	I have time to use apparel mass-customization option to buy a dress shirt.	49
	I have time to use design mass-customization to buy a dress shirt	50
	I have time to use fit mass-customization to buy a dress shirt.	51
	I have time to use personalization mass-customization to buy a dress shirt.	52
	I have money to pay the premium of design-customized dress shirts.	71
	I have money to pay the premium of fit mass-customized dress shirts.	74
	I have money to pay the premium of personalized (e.g. monogrammed) mass-customized dress shirts.	77
	I have money to pay the premium of mass-customized dress shirts in general.	80

Table 4.15. Items in Attitude toward Using Apparel Mass-customization and Purchase Intention for Mass-customized Apparel for Conducting Factor Analyses

Variable	Questions in the Final Questionnaire	Q #
Attitude toward Using Apparel Mass-customization	It is a very good idea to use mass-customization when shopping for dress shirts.	54
	I will find it very rewarding to use mass-customization when shopping for dress shirts.	55
	I would find using mass-customization a very enjoyable way to shop for dress shirts.	56
	Using mass-customization to shop for dress shirts is very beneficial.	57
Purchase Intention for Mass-customized Apparel	It is likely that I will purchase mass-customized dress shirts.	62
	It is likely that I will purchase a mass-customized dress shirt next time I need a dress shirt.	63
	The probability of me buying mass-customized dress shirts in the future is high.	64

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Table 4.16. List of Independent Variables and Dependent Variable in Hypotheses 1 to 4

Hypothesis	Independent Variables	Dependent Variable
H1. There will be significant a relationship between benefits sought and perceived usefulness of apparel mass-customization. H1a. The respondents who have a higher degree of uniqueness seeking in apparel products will perceive apparel mass-customization to be more useful. H1b. The respondents who have a higher degree of fit seeking in apparel products will perceive apparel mass-customization to be more useful. H1c. The respondents who have a higher degree of deal seeking (i.e., willingness to pay premium, sale proneness) in apparel shopping will perceive apparel mass-customization to be less useful.	- Uniqueness seeking - Fit seeking - Deal seeking (i.e. willingness to pay premium, sale proneness)	Perceived usefulness
H2. There will be a significant relationship between innovativeness and self-efficacy in using apparel mass-customization. H2a. The respondents who are more innovative in fashion will have more self-efficacy in using apparel mass-customization. H2b. The respondents who are more innovative in technology will have more self-efficacy in using apparel mass-customization.	- Fashion innovativeness - Technology innovativeness	Self-efficacy
H3. Perceived usefulness, self-efficacy and facilitating conditions are significantly associated with attitude toward using apparel mass-customization. H3a. The respondents who perceive apparel mass-customization as being more useful will have a more positive attitude toward using apparel mass-customization. H3b. The respondents who have higher self-efficacy in using apparel mass-customization will have a more positive attitude toward using apparel mass-customization. H3c. The respondents who perceive that they can more easily access to the resources needed to use apparel mass-customization (i.e., money availability, time availability) will have a more positive attitude toward using apparel mass-customization.	- Perceived usefulness - Self-efficacy - Facilitating conditions (i.e. money availability, time availability)	Attitude toward using apparel mass-customization
H 4. The respondents who have more a positive attitude toward using apparel mass-customization will have a higher intention to purchase mass-customized apparel.	- Attitude toward using apparel mass-customization	Purchase intention for mass-customized apparel

Table 4.17. List of Independent Variables and Dependent Variable in Hypotheses 5 to 8

Hypothesis	Independent Variables	Dependent Variable
H5. Predictors of overall purchase intention for mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of using apparel mass-customization, self-efficacy in using apparel mass-customization, facilitating conditions of using apparel mass-customization (i.e., money availability, time availability), and overall attitude toward using apparel mass-customization.	- Age - Educational attainment - Annual household income - Annual clothing expenditure - Uniqueness seeking - Fit seeking	Overall purchase intention for mass-customized apparel
H6. Predictors of purchase intention for design mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of using design mass-customization, self-efficacy in using design mass-customization, facilitating conditions of using design mass-customization (i.e., money availability, time availability), and attitude toward using design mass-customization.	- Deal seeking (i.e. willingness to pay premium, sale proneness) - Fashion innovativeness - Technology innovativeness - Perceived usefulness - Self-efficacy - Facilitating conditions (i.e. money availability, time availability) - Attitude toward using apparel mass-customization	Purchase intention for design mass-customized apparel
H7. Predictors of purchase intention for fit mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of using fit mass-customization, self-efficacy in using fit mass-customization, facilitating conditions of using fit mass-customization (i.e., money availability, time availability), and attitude toward using fit mass-customization.		Purchase intention for fit mass-customized apparel
H8. Predictors of purchase intention for personalization mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., willingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of using personalization mass-customization, self-efficacy in using personalization mass-customization, facilitating conditions of using personalization mass-customization (i.e., money availability, time availability), and attitude toward using personalization mass-customization.		Purchase intention for personalization mass-customized apparel

CHAPTER V
RESULTS

In this chapter, the results of the data analyses are presented and discussed in four sections. The first section provides a description of the profiles of the respondents. The second section is a discussion of the results of the preliminary data analysis, including (a) factor analysis of the variables that were measured with more than one item (i.e., uniqueness seeking, fit seeking , deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness, self-efficacy, facilitating conditions, attitude toward using apparel mass-customization, purchase intention for mass-customized apparel) and (b) descriptive statistics (e.g. means, ranges of all variables), and comparisons of means among the different types of benefits sought and innovativeness, and among the four types of apparel mass-customization (i.e., apparel mass-customization, design mass-customization, fit mass-customization, personalization mass-customization). The third section presents the results of statistical analyses to test the hypotheses, which include testing the proposed framework (Hypotheses 1 to 4) and identifying the predictors of apparel mass-customization (Hypotheses 5 to 8). A summary of the results is provided at the end of each section.

Profile of the Respondents

A total of 474 participants completed the survey. Six hundred seventy seven male adult panel members in the United States (U.S.) from the marketing research company, Market Tools, accessed the online survey on www.zoomerang.com. To better identify the profile of potential customers of mass-customized dress shirts, the respondent recruitment criteria set in this study were consumers who reside in the U.S., were males of age 20 years or older, and held a job in one of the two categories, (a) Sales and Office occupations or (b) Management, Professional and

related occupations based on the occupation categories used in the U.S. Census. The reasons for setting the respondent recruitment criteria were discussed in the section of Selection of Garment Category and Subjects in the last chapter. Among the 677 panel members who accessed to the survey, 140 participants were screened out because they did not meet the respondent recruitment criteria, and 63 participants did not complete the whole survey, resulting in 474 final useable responses. Among these 474 respondents, 408 (86.1%) had an occupation in the category of Management, Professional and related occupations, and 66 (13.9 %) were in the category of Sales and Office occupations.

Table 5.1 shows the online survey respondents' demographic characteristics (i.e. age, ethnicity, annual household income, educational attainment). To further understand the respondents' demographic characteristics, the demographic data of the respondents in the current study and that of the U.S. population were compared. The demographic data of the U.S. population were retrieved from U.S. Census statistical abstract (2009).

The results showed that in the age category, the percentages of the respondents in all age groups ranged from 17.7% to 23.0%, except the age categories of 20-24 and 55-64, which were much lower than those of the other age groups (i.e., 7.6% and 12.7%, respectively). The highest percentages were found in the age between 25 and 44 (43.9%); 20.9% in the age of 25-34, and 23.0% in the age of 35- 44. The Pearson's Chi-square results showed that the age distribution was significantly different from the U.S. Census data [X^2 (6, 474) = 383.59, p <.01]. The percentage in the age category of 35-44 seemed to be significantly higher than the percentage in U.S. Census (23.0% and 19.2%, respectively).

Most respondents were White/Caucasian, accounting for 81.2% of the total respondents. The race distribution of the respondents in the current study was significantly different from that of the U.S. Census [X^2 (6, 474) = 96.77, p <.001]. The percentage of White/Caucasian in the current study was significantly greater than the percentages of the U.S. population (81.2% vs 68.7%). The percentages of Hispanic and Black/African-American were lower than the data shown in the U.S. Census (3% vs. 14.2% and 4.2% vs. 10.7%, respectively).

The majority of the respondents had an annual household income between $50,000 and $149,000, accounting for 61.1% of the total respondents. The highest percentage was found in the categories between$50,000 and $74,999 (22.4%), followed by in the category of $100,000 - $149,999 (20.9%), and then the category of $75,000 - $99,999 (18.6%). The U.S. Census

Table 5.1 Comparisons of the Demographic Characteristics of the Respondents in the Current Study Survey and U.S. Census in Males' Age, Ethnicity, Annual Household Income, and Educational Attainment

Demographic Variable	Category	Current Study (%) (N)		U.S. Census Data for Males (%) (N=1000)		Comparison of Current Study and the U.S. Census
Age	20-24	7.6%	(36)	10.2%	(11,094)	
	25-34	20.9%	(99)	19.5%	(21,224)	
	35-44	23.0%	(109)	19.2%	(20,857)	X^2 (5, 474)
	45-54	17.7%	(84)	20.2%	(21,974)	= 13.07*
	55-64	12.7%	(60)	15.4%	(16,782)	
	65 and older	18.1%	(86)	15.5%	(16,824)	
Ethnicity (Race)	American Indian or Alaska Native	2.1%	(10)	0.9%	(1,581)	
	Asian	7.0%	(33)	3.8%	(6,769)	
	Black or African American	4.2%	(20)	10.7%	(18,936)	X^2 (6, 474)
	Native Hawaiian or Other Pacific Islander	0.6%	(3)	0.2%	(294)	= 96.77**
	White or Caucasian	81.2%	(385)	68.7%	(121,236)	
	Hispanic or Latino	3.0%	(14)	14.2%	(25,057)	
	Other	1.9%	(9)	1.5%	(2,633)	
Annual Household Income	Less than $10,000	2.9%	(14)	6.5%	(6,664)	
	$10,000-$14,999	1.9%	(9)	5.4%	(5,532)	
	$15,000- $24,999	3.2%	(15)	11.2%	(11,449)	
	$25,000- $34,999	7.8%	(37)	10.6%	(10,865)	
	$35,000- $49,999	10.5%	(50)	13.9%	(14,193)	X^2 (9, 474)
	$50,000- $74,999	22.4%	(106)	18.5%	(18,874)	= 102.68**
	$75,000- $99,999	18.6%	(88)	12.2%	(12,406)	
	$100,000-149,999	20.9%	(99)	13.0%	(13,298)	
	$150,000- $199,999	6.1%	(29)	4.4%	(4,524)	
	$200,000 and more	5.7%	(27)	4.3%	(4,373)	
Educational Attainment	Less than high school	0.6%	(3)	13.8%	(13,181)	
	High school graduate	2.7%	(13)	36.4%	(29,993)	X^2 (4, 474)
	Less than bachelor's degree	18.2%	(86)	24.7%	(23,593)	= 659.57 **
	College graduate	41.4%	(196)	19.0%	(18,148)	
	Graduate or professional degree	37.1%	(176)	11.1%	(10,602)	

* $p < .01$, ** $p < .001$

household income data from 2009 were compared with the findings of the current study. Because the respondents were all males, the number of "female only household" was subtracted from the total number in each household income category. The results of Pearson's Chi-square showed that the household income distribution of the current study was significantly different from that of the U.S. Census [X^2 (9,474)= 102.68, p <.001]. The percentage of the respondents who had a household income of $50,000 or more was significantly greater than that of the U.S. population (73.7% and 52.4%, respectively).

Regarding educational attainment, most of the respondents had a bachelor's degree or graduate degree, which accounted for more than three quarters of the total participants (41.4% bachelor's degree, 37.1% graduate degree). The Pearson's Chi-square results showed that the educational attainment distribution of the current study was significantly different from that of the U.S. Census [X^2 (4,474)= 659.57, p <.001]. The percentage of the respondents' who had a bachelor or graduate degree was significantly greater than that of the U.S. Census (78.5% and 30.1%, respectively).

Table 5.2 shows the respondents'; annual clothing expenditure and frequency of wearing dress shirts. More than two third of the respondents (69.6%) indicated that their annual clothing expenditure was in the range of $100 - $599. Nearly half of the respondents (45.2%) spent between $100 to $299; close to one quarter of the respondents (24.4%) spent between $300 and $599; and the other quarter (26.0%) of the respondents' expenditures in clothing ranged from $600 to more than $5,000. In addition to the annual clothing expenditure, the frequency of wearing dress shirt was reported. Over half of the respondents (53.4%) wore dress shirts at least once a week. Over a quarter of the respondents wore dress shirts on daily (26.4%) but 18.1% of the respondents reported that they almost never wear dress shirts.

Table 5.3 shows the respondents' overall purchase intention for mass-customized dress shirts and their willingness to purchase design, fit or personalization mass-customized dress shirts. In general, over half of the respondents (56.3%) reported that they were likely to purchase mass-customized dress shirts. Regarding their willingness to purchase design, fit, or personalization mass-customized dress shirts, 46.6% of the respondents were likely to purchase design mass-customized dress shirts, 54.2% of the respondents were likely to purchase fit mass-customized dress shirts, and 35.9% of the respondents were likely to purchase personalization mass-customized dress shirts. These results showed that among the three types of apparel mass-customization, more respondents were willing to purchase fit mass-customized dress shirts, followed by design mass-customized dress shirts, and then personalization mass-customized dress shirts.

In summary, the majority of the respondents in the current study were in the age of 25 to 44, White/Caucasian, and highly educated. They also had relatively higher income than the U.S. general population. Their annual expenditure in clothing was less than $300. Over half of the respondents wore dress shirts at least once a week. More than half of the respondents were willing to purchase mass-customized dress shirts, in general. More specifically, they were most

Table 5.2. Respondents' Annual Clothing Expenditure and Frequency of Wearing Dress Shirts

Variables	Categories	N	%
Annual Clothing Expenditure	None	21	4.4%
	$1-$99	53	11.2%
	$100-199	74	15.6%
	$200-$299	87	18.4%
	$300-$399	36	7.6%
	$400-$499	41	8.6%
	$500-$599	39	8.2%
	$600-$699	15	3.2%
	$700-$799	12	2.5%
	$800-$899	7	1.5%
	$900-$999	16	3.4%
	$1,000-$1,999	34	7.2%
	$2,000-$2,999	23	4.9%
	$3,000-$3,999	3	0.6%
	$4,000-$4,999	4	0.8%
	$5,000 or more	9	1.9%
Frequency of Wearing Dress Shirts	Almost never	86	18.1%
	Less than once a month	74	15.6%
	About once or twice a month	61	12.9%
	About once a week	58	12.2%
	About three times a week	70	14.8%
	Almost every day	125	26.4%

Table 5.3. Respondents' Willingness of Purchasing Mass-customized Dress Shirts

Response Scales	Overall Purchase Intention for Mass-customized Dress Shirts		Purchase Intention for Design Mass-customized Dress Shirts		Purchase Intention for Fit Mass-customized Dress Shirts		Purchase Intention for Personalization Mass-customized Dress Shirts	
	N	%	N	%	N	%	N	%
1. Strongly Agree	48	10.1%	45	9.5%	64	13.5%	43	9.1%
2. Agree	219	46.2%	176	37.1%	193	40.7%	127	26.8%
3. Disagree	126	26.6%	158	33.3%	133	28.1%	159	33.5%
4. Strongly Disagree	81	17.1%	95	20.0%	84	17.7%	145	30.6%

likely to purchase fit mass-customized dress shirts and were least likely to purchase personalization mass-customized dress shirts.

In summary, a majority of the respondents in the current study were in the age of 25 to 44, White/Caucasian, and highly educated. They also had relatively higher income than the U.S. general population. Their annual expenditure in clothing was less than $300. Over half of the respondents wore dress shirts at least once a week. More than half of the respondents were willing to purchase mass-customized dress shirts, in general. More specifically, they were most

likely to purchase fit mass-customized dress shirts and were least likely to purchase personalization mass-customized dress shirts.

Preliminary Data Analyses

Preliminary data analyses were performed in two parts. First, factor analyses were conducted to examine the validity of measures. The internal consistency of the items measuring the same variable was examined. A high internal consistency indicated that the items measured a similar construct. The descriptive statistics (e.g., means, standard deviations, ranges) were used to show where the average of responses lied for each variable, how close the data were to the average, and how the data were distributed. In addition to the descriptive statistics, repeat measures MANOVA was used to compare the means of different types of benefits sought and innovativeness, and the means of different types of perceived usefulness, self-efficacy, facilitating conditions, attitude toward apparel mass-customization, and purchase intention for mass-customized apparel, based on the four types of apparel mass-customization (i.e., apparel mass-customization in general, design mass-customization, fit mass-customization, personalization mass-customization).

Factor Analysis

Exploratory factor analyses were conducted for 10 variables that were measured with more than one item (i.e., uniqueness seeking, fit seeking, deal seeking, fashion innovativeness, technology innovativeness, perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, facilitating conditions of using apparel mass-customization, attitude toward using apparel mass-customization, and purchase intention for mass-customized apparel). Eigenvalues greater than 1.0, and factor loadings of .50 or greater, and cross-loadings less than .40 on any other factor were the criteria for retaining items (Hair, Tatham, Anderson, & Black, 1998). Principal component analysis with Varimax rotation was used to obtain a clear pattern of loadings.

The factor analyses results showed that all variables except two (i.e., deal seeking, facilitating conditions) extracted only one factor for each variable. The values of Cronbach's

alpha for each variable with one factor are specified in Table 5.4. The Cronbach's *alpha* for all variables, except fit seeking, ranged from .90 to .94, indicating a high internal consistency. According to Malhotra (2009), a scale with a Cronbach's *alpha* of 0.60 or higher is considered to be reliable. The Cronbach's *alpha* of fit seeking was .54, which was below the anticipated level due to a lack of measures in prior studies, and the measures of fit seeking were developed by the researcher based on the findings of previous studies. Because of the newness of this scale, the factor was retained; however, a prudent interpretation is needed.

Table 5.4. Cronbach's alpha of one-factor variables

Variable	Cronbach's alpha
Uniqueness seeking	0.94
Fit seeking	0.54
Fashion innovativeness	0.94
Technology innovativeness	0.90
Perceived usefulness	0.90
Self-efficacy	0.89
Attitude toward using apparel mass-customization	0.94
Purchase intention for mass-customized apparel	0.91

Two variables, deal seeking and facilitating conditions, were extracted two factors. Table 5.5 shows the results of the factor analysis for deal seeking. Three questions were in the first factor, two questions were in the second factor, and one item was eliminated because the factor loading of this item was lower than the .50 criterion. The eliminated item was "There is absolutely no relationship between the price of clothing and the satisfaction that I get from the product". The items in the first factor were related to a consumer's willingness to pay more for the best. Because the items were designed to measure whether the respondents were seeking deals or not, the factor was labeled "unwillingness to pay premium," and the scores were reverse-coded. This factor accounted for 31.77% of the variance in deal seeking. The items in the second factor were related to consumer's behavior in shopping for apparel products on sale and their proneness to shop for items on sale, and thus, the factor was named "sale proneness," accounting for 27.88% of the variance in deal seeking. The Cronbach's *alpha* were .71 and .73, respectively, indicating that the measurement items included in each of the two factors consistently measured a same construct according to Malhotra (2009) because Cronbach's alpha values were higher than 0.6.

Table 5.5 Factor Analysis for Deal seeking

Factor labels and statements	Eigenvalue	Factor loading	% of explained variance	Coefficient alpha
Unwillingness to pay premium (Scores were reverse-coded)	2.17		31.77	0.71
When purchasing clothing, I pay more for the best.		.824		
I am willing to pay extra for clothing that I desire.		.818		
The price of clothing is a good indicator of its quality.		.662		
Sale proneness	1.41		27.88	0.73
I almost always buy only the clothing that is on sale.		.872		
Compared to most people, I buy clothing that is on sale more frequently.		.836		

Table 5.6 shows the results of the factor analysis for facilitating conditions. Because all items in the first factor were related to consumer's perception on whether he had money to buy a mass-customized dress shirt, the factor was labeled "Money Availability." This factor contained four items, accounting for 42.48% of the variance in facilitating conditions. The second factor was named "Time Availability" because all items in the second factor were related to the consumer's perception on whether or not he had time to participate in apparel mass-customization process. This factor contained four items, accounting for 41.82% of the variance in facilitating conditions. The Cronbach's *alpha* of the two factors were .94 and .93, indicating a high internal consistency in both factors.

Table 5.6 Factor Analysis for Facilitating Conditions

Factor labels and statements	Eigenvalue	Factor loading	% of explained variance	Coefficient alpha
Money Availability	4.93		42.48	0.94
I have money to pay the premium of fit mass-customized dress shirts.		.909		
I have money to pay the premium of personalized (e.g. monogrammed) dress shirts.		.895		
I have money to pay the premium of mass-customized dress shirts in general.		.890		
I have money to pay the premium of design mass-customized dress shirts.		.889		
Time Availability	1.81		41.82	0.93
I have time to use design mass-customization to buy a dress shirt.		.906		
I have time to use fit mass-customization to buy a dress shirt.		.897		
I have time to use mass-customization to buy a dress shirt.		.892		
I have time to use personalization mass-customization to buy a dress shirt.		.852		

<u>Means, Standard Deviations, and Ranges of All Variables and Comparison of Means</u>

The descriptive statistics, means, standard deviations, and score ranges of each variable or factor were shown in Table 5.7. Repeat measures MANOVA and the Bonferroni post hoc test were used to compare the means among the variables that were related to the four different types of apparel mass-customization and to examine if there was a significant difference among the four types. All variables were measured by a four-point Likert type scale. "1" indicated the most favorable rating, such as "strongly agree" and "4" indicated the least favorable rating, such as "strongly disagree." Therefore, a smaller number indicated a more favorable response to the question.

The results showed that the mean scores of the three types of benefits sought (i.e., uniqueness seeking, fit seeking, deal seeking) were significantly different [$F(3, 471) = 30.91$, $p < .001$] (see Table 5.7). The Bonferroni post hoc test results showed that the means of unwillingness to pay premium and uniqueness seeking were not significantly different but they were significantly higher than the mean score of fit seeking, and the mean of fit seeking was

Table 5.7 Mean Scores, Comparison of Means, Standard Deviations, and Ranges for All Variables

	M	SD	Range	F
Benefits Sought				30.91*
Uniqueness seeking	2.47 [a]	0.61	1 – 4	
Fit seeking	2.29 [b]	0.50	1 – 4	
Deal seeking				
Unwillingness to pay premium	2.48 [a]	0.60	1 – 4	
Sale proneness	2.14 [c]	0.70	1 – 4	
Innovativeness				264.98*
Fashion innovativeness	2.89	0.75	1 – 4	
Technology innovativeness	2.37	0.68	1 – 4	
Perceived Usefulness				25.27*
Apparel Mass-Customization in general	2.37 [b]	0.74	1 – 4	
Design Mass-Customization	2.32 [b]	0.82	1 – 4	
Fit Mass-Customization	2.22 [c]	0.79	1 – 4	
Personalization Mass-Customization	2.55 [a]	0.89	1 – 4	
Perceived Behavioral Control				
Self-efficacy				2.52
Apparel Mass-Customization in general	2.22	0.65	1 – 4	
Design Mass-Customization	2.33	0.75	1 – 4	
Fit Mass-Customization	2.29	0.74	1 – 4	
Personalization Mass-Customization	2.39	0.76	1 – 4	
Facilitating Conditions				
Money Availability				14.33*
Apparel Mass-Customization in general	2.34 [bc]	0.92	1 – 4	
Design Mass-Customization	2.40 [b]	0.92	1 – 4	
Fit Mass-Customization	2.33 [c]	0.91	1 – 4	
Personalization Mass-Customization	2.51 [a]	0.99	1 – 4	
Time Availability				7.05*
Apparel Mass-Customization in general	2.27 [c]	0.80	1 – 4	
Design Mass-Customization	2.33 [ab]	0.84	1 – 4	
Fit Mass-Customization	2.29 [bc]	0.83	1 – 4	
Personalization Mass-Customization	2.39 [a]	0.88	1 – 4	
Attitude toward Using Apparel Mass-customization				15.95*
Apparel Mass-Customization in general	2.30 [bc]	0.71	1 – 4	
Design Mass-Customization	2.31 [b]	0.78	1 – 4	
Fit Mass-Customization	2.24 [c]	0.78	1 – 4	
Personalization Mass-Customization	2.48 [a]	0.84	1 – 4	
Purchase Intention for Mass-customized Apparel				37.89*
Apparel Mass-Customization in general	2.52 [c]	0.87	1 – 4	
Design Mass-Customization	2.64 [b]	0.90	1 – 4	
Fit Mass-Customization	2.50 [c]	0.94	1 – 4	
Personalization Mass-Customization	2.86 [a]	0.96	1 – 4	

Notes: All variables were measured by a four-point Likert type scale. "1" indicated the most favorable rating and "4" indicated the least favorable rating.

Means with different superscript letters (a, b, c) are significantly different at the .05 level. $^*p < .001$

significantly higher than that of sale proneness. In other words, the lowest mean score was in sale proneness among the four variables in benefit sought. Noting that a four-point Likert type scale where "1" was strongly agree and "4" was strongly disagree, this result showed that the respondents were most sale prone but were least likely to seek uniqueness in apparel shopping or least unwilling to pay premium. The mean scores of uniqueness seeking and unwillingness to pay premium were both near neutral ($M = 2.47$ and 2.48, respectively), given that 2.5 was the middle point between 2 = agree and 3 = disagree.

The mean scores of two types of innovativeness (i.e., fashion innovativeness, technology innovativeness) were significantly different [$F(2, 471) = 264.98$, $p < .001$]. The mean score of fashion innovativeness was higher than the mean score of technology innovativeness, which indicated that the respondents were more innovative in terms of adopting new technology than new fashion. Noting that 2.5 is the middle point between 2 = agree and 3 = disagree, the means of the two types of innovativeness showed that the respondents tended to be innovative in adopting technology but were not innovative in fashion ($M = 2.89$ and 2.37, respectively).

The mean scores for the perceived usefulness of four types of mass-customization (i.e., perceived usefulness of apparel mass-customization in general, perceived usefulness of design mass-customization, perceived usefulness of fit mass-customization, perceived usefulness of personalization mass-customization) were found to be significantly different [$F(3, 471) = 25.27$, $p < .001$]. The Bonferroni post hoc test results showed that the means of perceived usefulness of personalization mass-customization was the highest, followed by perceived usefulness of design mass-customization and perceived usefulness of apparel mass-customization in general, and the lowest score was found in perceived usefulness of fit mass-customization. This result showed that the respondents perceived fit mass-customization the most useful, and personalization mass-customization the least useful. Noting that 2.5 is the middle point between 2 = agree and 3 = disagree, the respondents perceived fit mass-customization, design mass-customization, and apparel mass-customization in general to be useful ($M = 2.22$, 2.32, 2.37, respectively), but the mean score of perceived personalization mass-customization was near neutral, slightly lower than average ($M = 2.55$).

For the self-efficacy in using apparel mass-customization, the results showed that the mean scores for the self-efficacy in using four types of mass-customization (i.e., self-efficacy in using apparel mass-customization in general, self-efficacy in using design mass-customization,

self-efficacy in using fit mass-customization, self-efficacy in using personalization mass-customization) were not significantly different [$F(3, 471) = 2.52$, $p = 0.06$]. All means scores of self-efficacy in using various types of mass-customization were lower than 2.5, indicating that the respondents had self-confidence in participating in any particular type of apparel mass-customization. There was no significant difference in their level of self-confidence in participating in various types of apparel mass-customization.

For the money availability factor of facilitating conditions, the results showed that the mean scores of the money availability for four types of mass-customized apparel (i.e. money availability for mass-customized apparel in general, money availability for design mass-customized apparel, money availability for fit mass-customized apparel, money availability for personalization mass-customized apparel) were significantly different [$F(3, 471) = 14.33$, $p < .001$]. The lowest mean score for money availability was found in fit mass-customized apparel, and the highest score was in personalization mass-customized apparel, indicating that the respondents considered that they had most money available for fit mass-customized apparel and had least money available for personalization mass-customized apparel. The mean scores for the time availability factor among four types of mass-customization were also significantly different [$F(3, 471) = 9.05$, $p < .001$]. The Bonferroni post hoc test results showed that the respondents had more time for participating in apparel mass-customization in general and in fit mass-customization than they had for using design mass-customization and personalization mass-customization.

With regards to the attitude toward using four types of apparel mass-customization (i.e., attitude toward using apparel mass-customization in general, attitude toward using design mass-customization, attitude toward using fit mass-customization, attitude toward using personalization mass-customization), the results showed that the mean scores were significantly different [$F(3, 471) = 15.95$, $p < .001$]. The Bonferroni post hoc test showed that the highest mean score was found in the attitude toward using personalization mass-customization, and the lowest mean score was found in attitude toward using fit mass-customization. These results indicated that the respondents had the most favorable attitude toward using fit mass-customization and the least favorable attitude toward using personalized mass-customization.

Lastly, the results of the comparison among the means of purchase intentions for the four types of mass-customized apparel (i.e., purchase intention for mass-customized apparel in

general, purchase intention for design mass-customized apparel, purchase intention for fit mass-customized apparel, purchase intention for personalization mass-customized apparel) revealed that the mean scores were significantly different [$F(3, 471) = 37.89, p < .001$]. The Bonferroni post hoc test results showed that the purchase intention for personalization mass-customized apparel had the highest mean, followed by design mass-customized apparel, and then fit mass-customized apparel, indicating that the participants were most willing to purchase fit mass-customized apparel, followed by design mass-customized apparel, and were least willing to purchase personalized mass-customized apparel.

Summary of Preliminary Data Analyses

In summary, the exploratory factor analyses extracted two factors in the measures of deal seeking (i.e., unwillingness to pay premium, sale proneness) and two factors in the measures of facilitating conditions (i.e., money availability, time availability). Other than deal seeking and facilitating conditions, the rest of the variables (i.e., uniqueness seeking, fit seeking, perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, attitude toward using apparel mass-customization, purchase intention for mass-customized apparel) were found to be one-factor variables.

The results of the comparisons of means revealed consistent results. Among the three types of apparel mass-customization, fit mass-customization consistently received the most favorable responses. The respondents perceived that fit mass-customization was the most useful type of mass-customization, had the most money available for fit mass-customized apparel, had the most time for using fit mass-customization, had the most favorable attitude toward using fit mass-customization, and had the highest purchase intention for fit mass-customized apparel. In contrast, personalization mass-customization consistently received the least favorable responses. The respondents perceived personalization mass-customization to be the least useful type of apparel mass-customization, had the least money available for personalization mass-customized apparel, had the least time for using personalization mass-customization, had the least favorable attitudes toward using personalization mass-customization, and had the lowest intention to purchase personalized apparel.

Results of Statistical Analysis to Test Hypotheses

In Chapter III, a framework model was developed and four hypotheses, Hypotheses 1 - 4, were formulated to test the relationships proposed in the framework. Additional four hypotheses, Hypotheses 5 – 8, were formulated to identify the predictors of the overall purchase intention for mass-customized apparel and the predictors of each of the three types of apparel mass-customization (i.e., design mass-customization in general, fit mass-customization, personalization mass-customization) among all the variables proposed and the demographic variables included in the study. To test these hypotheses, stepwise multiple regression analyses were used because stepwise multiple regression analysis helps to identify the most predictive variables in the order of the level of statistical significance.

Testing the Proposed Framework

Hypotheses 1 - 4, were formulated to test the relationships proposed in the framework (i.e., relationships among benefits sough, innovativeness, perceived usefulness, self-efficacy, facilitating conditions, attitude toward using apparel mass-customization, purchase intention for mass-customized apparel). The examination of each hypothesis was discussed below:

Relationship between Benefits Sought and Perceived Usefulness (Hypothesis 1)

Hypothesis 1 (H1) was formulated to test the relationship between benefits sought (i.e. uniqueness seeking, fit seeking, deal seeking) and perceived usefulness of apparel mass-customization. H1 was formulated as below:

H1.   There will be significant a relationship between benefits sought and perceived usefulness of apparel mass-customization.

    H1a.   The respondents who have a higher degree of uniqueness seeking in apparel products will perceive apparel mass-customization to be more useful.

    H1b.   The respondents who have a higher degree of fit seeking in apparel products will perceive apparel mass-customization to be more useful.

H1c.   The respondents who have a higher degree of deal seeking in apparel shopping will perceive apparel mass-customization to be less useful.

The exploratory factor analysis extracted two factors in deal seeking; that were unwillingness to pay premium and sale proneness. Therefore, four independent variables (i.e., uniqueness seeking, fit seeking, unwillingness to pay premium, sale proneness were included in the stepwise regression analysis to test the relationships with perceived usefulness. The results of the stepwise multiple regression showed that uniqueness seeking, fit seeking, and unwillingness to pay premium were the three significant variables included in the final regression equation (see Table 5.8 and Figure 5.1), but sale proneness, one of the factors in deal seeking did not enter in the equation. The significant F value indicated that the equation was significant in predicting perceived usefulness of apparel mass-customization [$F(3, 470) = 46.39, p < .001$]. The t-values showed that these three variables significantly contributed to the prediction of perceived usefulness of apparel mass-customization. The coefficient of multiple correlation (R) was .48, and the square of the correlation coefficient (R^2) was .23, indicating that 23% of the variance in perceived usefulness was explained by the equation that included uniqueness seeking, fit seeking, and unwillingness to pay premium. The standardized regression coefficients (β) showed that uniqueness seeking ($\beta = .32, p < .001$) contributed the most in predicting perceived usefulness, followed by unwillingness to pay premium ($\beta = -.16, p < .01$) and then fit seeking ($\beta = .10, p < .05$). These results showed that the respondents who sought uniqueness and better fit in clothing, and who were willing to pay premium perceived apparel mass-customization to be more useful. Sale proneness, on the other hand, did not explain the perceived usefulness of apparel mass-customization. Therefore, the respondents who were prone to sale and discounts (i.e. who were deal seekers) may or may not perceive apparel mass-customization useful.

Tolerance and Variance Inflation Factor (VIF) were two measures used to examine if a high multicollinearity existed among the variables included in the regression model. The regression model with multicollinearity cannot indicate how predictive an individual predictor variable is (Slinker & Glantz, 1985). When two variables are highly correlated, they are basically measuring the same phenomenon or construct. It is difficult to determine if one variable better predicts the dependent variable than the other. Such problems may also result in incorrect conclusions about relationships between independent and dependent variables because when two

Table 5.8 Relationship between Benefits Sought and Perceived Usefulness (Hypothesis 1)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Perceived usefulness						
Step 1	.20					
Constant		1.05				
Uniqueness seeking		.54	.44	10.75**	1.00	1.00
Step 2	.22					
Constant		1.85				
Uniqueness seeking		.43	.36	7.60**	.75	1.33
Unwillingness to pay premium		-.22	-.18	- 3.76**	.75	1.33
Step 3	.23					
Constant		1.54				
Uniqueness seeking		.39	.32	6.61**	.69	1.46
Unwillingness to pay premium		-.20	-.16	-3.31*	.73	1.37
Fit seeking		.16	.10	2.28	.80	1.25
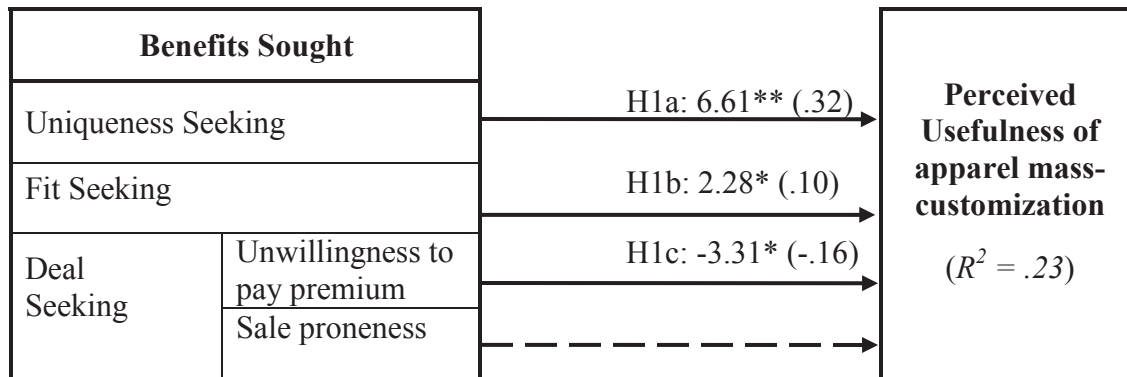
*$p < .05$, **$p < .001$

Figure 5.1 Relationship between Benefits Sought and Perceived Usefulness (Hypothesis 1)

Notes: *t* value and standardized regression coefficients were presented.
A solid line indicated a significant relationship existed between the two variables, and a dash line indicated the two variables were not significant related.
* $p < .05$; ** $p < .001$

highly correlated variables are included in the regression model, the results may show that neither variable may contribute significantly to the model but together they contribute a lot (Motulsky, 2002). In order to avoid this situation, an examination of multicollinearity among the independent variables is necessary. According to Belsley et al. (1980), if Tolerance is greater than 0.1 and VIF is smaller than 10, the correlation between variables is considered low enough to

avoid the situation of including highly correlated variables in the regression equation. In the three steps of regression analyses to test H1, the Tolerance values were all greater than 0.1 and the VIF values were all smaller than 10, meaning that the three variables included in the equation were not highly correlated.

Based on the above results, H1a and H1b were supported, and H1c was partially supported because only one of the factors in deal seeking, unwillingness to pay premium, predicted the perceived usefulness of apparel mass-customization. Therefore, the main H1 was partially supported.

Relationship between Innovativeness and Self-efficacy (Hypothesis 2)

Hypothesis 2 (H2) was formulated to test the relationship between the two types of innovativeness (i.e. fashion innovativeness, technology innovativeness) and self-efficacy in using apparel mass-customization. H2 was formulated as below:

H2. There will be a significant relationship between innovativeness and self-efficacy in using apparel mass-customization.

H2a. The respondents who are more innovative in fashion will have more self-efficacy in using apparel mass-customization.

H2b. The respondents who are more innovative in technology will have more self-efficacy in using apparel mass-customization.

The results of the stepwise multiple regression analysis showed that both technology innovativeness and fashion innovativeness were included in the final step of the regression equation (see Table 5.9 and Figure 5.2). The significant F value indicated that this equation was significant in explaining self-efficacy in using apparel mass-customization [$F(2, 471) = 61.23$, $p < .001$]. The t-values showed that both independent variables significantly contributed to the predication of self-efficacy in using apparel mass-customization. The coefficient of multiple correlation (R) was .45 and the square of the correlation coefficient (R^2) was .21, indicating that 21% of the variance in self-efficacy was explained by this regression equation. The standardized regression coefficients (β) showed that technology innovativeness ($\beta = .28$, $p < .001$) contributed more in explaining self-efficacy than did fashion innovativeness ($\beta = .24$, $p < .001$). Tolerance values were all greater than 0.1 and VIF values were smaller than 10, indicating that the two

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variables included in the equation were not highly correlated (Belsley, et al., 1980). These results showed that the respondents who were innovative in terms of technology and fashion were more self-confident in using apparel mass-customization. Based on the above results, all variables related to consumer innovativeness (i.e. technology innovativeness, fashion innovativeness) predicted self-efficacy in using apparel mass-customization process. H2a and H2b were both supported, and therefore, the main H2 was supported.

Table 5.9 Relationship between Innovativeness and Self-efficacy (Hypothesis 2)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Self-efficacy in participating in apparel mass-customization						
Step 1	.16					
Constant		1.31				
Technology innovativeness		.39	.41	9.61[*]	1	1
Step 2	.21					
Constant		.99				
Technology innovativeness		.26	.28	5.69[*]	.72	1.39
Fashion innovativeness		.21	.24	5.03[*]	.72	1.39

[*]$p < .001$.
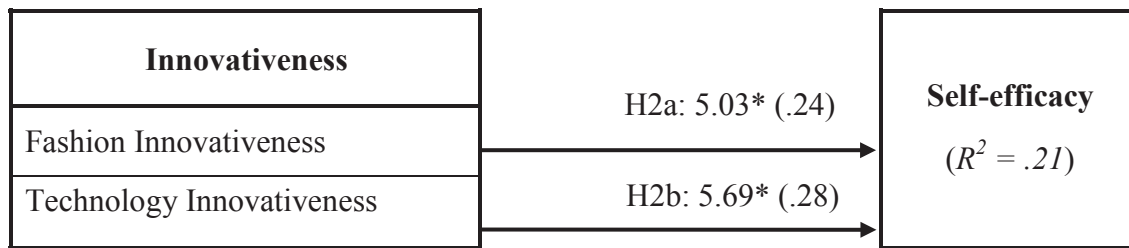
Notes: *t* value and standardized regression coefficients were presented.
*p <.001

Figure 5.2 Relationship between Innovativeness and Self-efficacy (Hypothesis 2)

Relationships of Attitude toward Using Apparel Mass-customization with Perceived Usefulness, Self-efficacy and Facilitating Conditions (Hypothesis 3)

Hypothesis 3 (H3) was formulated to test the relationships of attitude toward using apparel mass-customization with three variables (i.e., perceived usefulness, self-efficacy, and facilitating conditions). H3 including H3a, H3b, and H3c were formulated as below:

H3. Perceived usefulness, self-efficacy and facilitating conditions are significantly associated with attitude toward using apparel mass-customization.

   H3a   The respondents who perceive apparel mass-customization as being more useful will have a more positive attitude toward using apparel mass-customization.

   H3b   The respondents who have higher self-efficacy in using apparel mass-customization will have a more positive attitude toward using apparel mass-customization.

   H3c   The respondents who perceive that they can more easily access to the resources needed to use apparel mass-customization will have a more positive attitude toward using apparel mass-customization.

Because two factors, money availability and time availability, were extracted from the measures of facilitating conditions in the exploratory factor analysis, four independent variables (i.e. perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, money availability, time availability) were included to examine H3. The results of the stepwise multiple regression analysis showed that time availability, perceived usefulness of apparel mass-customization, and self-efficacy in using apparel mass-customization significantly contributed to the regression equation (see Table 5.10 and Figure 5.3), but the money availability factor of facilitating conditions was not included in the stepwise multiple regression. The significant F value indicated that this equation was significant in explaining attitude toward using apparel mass-customization [$F(3, 470) = 975.99$, $p < .001$]. The t-values showed that these three independent variables contributed to the prediction of attitude toward using apparel mass-customization. The coefficient of multiple correlation (R) for this equation was .93, and the square of the correlation coefficient (R^2) was .86, indicating that 86% of the variance in attitude toward apparel mass-customization was explained by this equation. The standardized regression

coefficients (β) showed that time availability ($\beta = .73$, $p <.001$) contributed the most in explaining attitude toward using apparel mass-customization, followed by perceived usefulness ($\beta = .18$, $p <.001$), and then self-efficacy ($\beta = .10$, $p <.001$). Tolerance values were all greater than 0.1 and VIF values were smaller than 10, indicating that the three variables included in the equation were not highly correlated (Belsley et al., 1980). These results indicated that the respondents who perceived that they had more time to use apparel mass-customization, that apparel mass-customization to be more useful, and that they were more self-confident in using apparel mass-customization showed more favorable attitude toward using apparel mass-customization. However, their perceptions about whether or not they had money for mass-customized apparel had no relationship with their attitude toward using apparel mass-customization. Based on the results above, H3a and H3b were supported, and H3c was partially supported because, between the two factors of facilitating conditions, only time availability predicted attitude toward using apparel mass-customization, while money availability factor did not. Therefore, the main H3 was partially supported.

Table 5.10   Relationships of Attitude toward Using Apparel Mass-customization with Perceived Usefulness, Self-efficacy and Facilitating Conditions (Hypothesis 3)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Attitude toward using apparel mass-customization						
Step 1	.83					
Constant		.41				
Time availability		.81	.91	48.65[*]	1	1
Step 2	.86					
Constant		.24				
Time availability		.68	.77	31.44[*]	.51	1.95
Perceived usefulness		.20	.21	8.57[*]	.51	1.95
Step 3	.86					
Constant		.15				
Time availability		.65	.73	28.71[*]	.46	2.20
Perceived usefulness		.17	.18	7.02[*]	.47	2.15
Self-efficacy		.11	.10	4.33[*]	.57	1.75

[*] $p < .001$
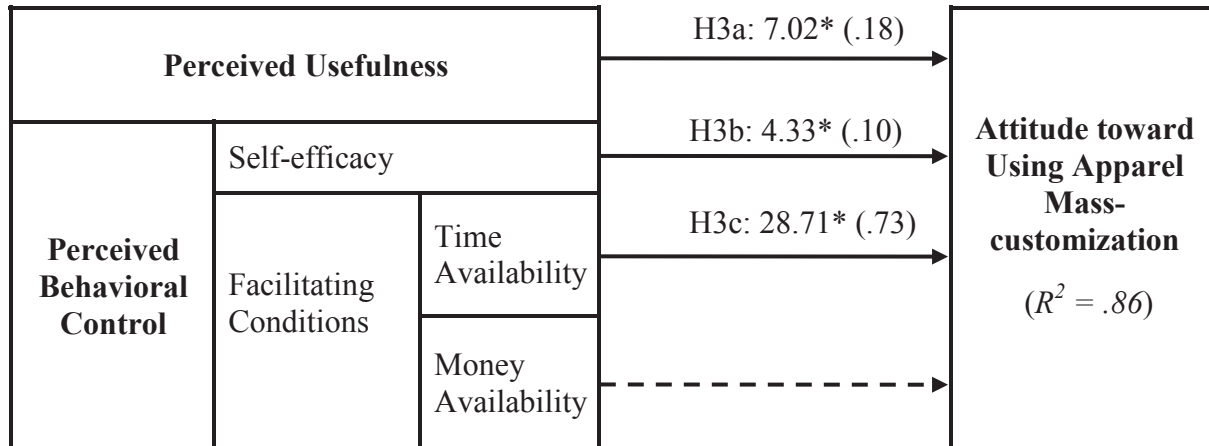
```
┌─────────────────────────────────────┐                      ┌──────────────────┐
│        Perceived Usefulness         │  H3a: 7.02* (.18)    │                  │
├──────────────┬──────────────────────┤─────────────────────►│ Attitude toward  │
│              │  Self-efficacy       │  H3b: 4.33* (.10)    │ Using Apparel    │
│              ├──────────┬───────────┤─────────────────────►│ Mass-            │
│ Perceived    │          │ Time      │  H3c: 28.71* (.73)   │ customization    │
│ Behavioral   │ Facilitating Availability│──────────────────►│                  │
│ Control      │ Conditions├───────────┤                     │ (R² = .86)       │
│              │          │ Money     │ ─ ─ ─ ─ ─ ─ ─ ─ ─ ►  │                  │
│              │          │ Availability│                     │                  │
└──────────────┴──────────┴───────────┘                      └──────────────────┘
```

Notes: *t* value and standardized regression coefficients were presented.
A solid line indicated a significant relationship existed between the two variables, and a dash line indicated the two variables were not significant related.
* *p* <.001

Figure 5.3   Relationships of Attitude toward Apparel Mass-customization with Perceived Usefulness, Self-efficacy and Facilitating Conditions (Hypothesis 3)

Relationship of Attitude toward Using Apparel Mass-customization and Purchase Intention for Mass-customized Apparel (Hypothesis 4)

Hypothesis 4 (H4) was formulated to examine the relationship between attitude toward using apparel mass-customization and purchase intention for mass-customized apparel. It was formulated as below:

H 4.   The respondents who have more a positive attitude toward using apparel mass-customization will have a higher intention to purchase mass-customized apparel.

The results of the regression analysis showed that attitude toward using apparel mass-customization had a significant relationship with purchase intention for mass-customized apparel. Both *F* value [$F(1, 472) = 745.94, p < .001$] and *t*-value [$t(1, 472) = 27.31, p < .001$] indicate that attitude toward using apparel mass-customization significantly contributed to the prediction of overall purchase intention for mass-customized apparel. In other words, the respondents who had more favorable attitude toward using apparel mass-customization had higher purchase intention for mass-customized apparel. The coefficient of multiple correlation (*R*) for this equation was .78 and the square of the correlation coefficient (R^2) was .61, indicating

that 61% of the variance in overall purchase intention for mass-customized apparel was explained by the variable of attitude toward using apparel mass-customization. Based on the above results, Hypothesis 4 was supported.

Summary of the Results in testing the Proposed Framework

Table 5.11 was used to summarize the results of the statistical analysis to test the proposed framework (H1to H4). H2 and H4 were fully supported, and H1 and H3 were partially supported. Figure 5.4 was used to illustrate the results in testing the proposed framework.

Table 5.11 Hypothesized Relationships and Summary of Results (Hypothesis 1 to 4)

H1. There will be significant a relationship between benefits sought and perceived usefulness of apparel mass-customization.
H1a. The respondents who have a higher degree of uniqueness seeking in apparel products will perceive apparel mass-customization to be more useful.
H1b. The respondents who have a higher degree of fit seeking in apparel products will perceive apparel mass-customization to be more useful.
H1c. The respondents who have a higher degree of deal seeking (i.e., unwillingness to pay premium, sale proneness) in apparel shopping will perceive apparel mass-customization to be less useful.

Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 1
1. Uniqueness seeking 2. Unwillingness to pay premium 3. Fit seeking	H1 was partially supported. The respondents who had a higher degree of uniqueness seeking and fit seeking in apparel products, and unwillingness to pay premium perceived apparel mass-customization to be more useful. However, no significant relationship was found between sale proneness and perceived usefulness of apparel mass-customization.

H2. There will be a significant relationship between innovativeness and self-efficacy in using apparel mass-customization.
H2a. The respondents who are more innovative in fashion will have more self-efficacy in using apparel mass-customization.
H2b. The respondents who are more innovative in technology will have more self-efficacy in using apparel mass-customization.

Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 2
1. Technology innovativeness 2. Fashion innovativeness	H2 was fully supported. The respondents who had a higher degree of technology innovativeness and fashion innovativeness had higher self-efficacy in using apparel mass-customization.

H3. Perceived usefulness, self-efficacy and facilitating conditions are significantly associated with attitude toward using apparel mass-customization. H3a The respondents who perceive apparel mass-customization as being more useful will have a more positive attitude toward using apparel mass-customization. H3b The respondents who have higher self-efficacy in using apparel mass-customization will have a more positive attitude toward using apparel mass-customization. H3c The respondents who perceive that they can more easily access to the resources needed to use apparel mass-customization (i.e., money availability, time availability) will have a more positive attitude toward using apparel mass-customization.	
Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 3
1. Time availability 2. Perceived usefulness 3. Self-efficacy	H3 was partially supported. The respondents who perceived apparel mass-customization useful, who had higher self-efficacy, and who had more time availability had more favorable attitude toward using apparel mass-customization. No significant relationship was found between money availability and attitude toward using apparel mass-customization.
H 4. The respondents who have more a positive attitude toward using apparel mass-customization will have a higher intention to purchase mass-customized apparel.	
Significant variable	Conclusion for Hypothesis 4
Attitude toward using apparel mass-customization	H4 was fully supported. The respondents who had more favorable attitude toward using apparel mass-customization were more likely to purchase mass-customized apparel.
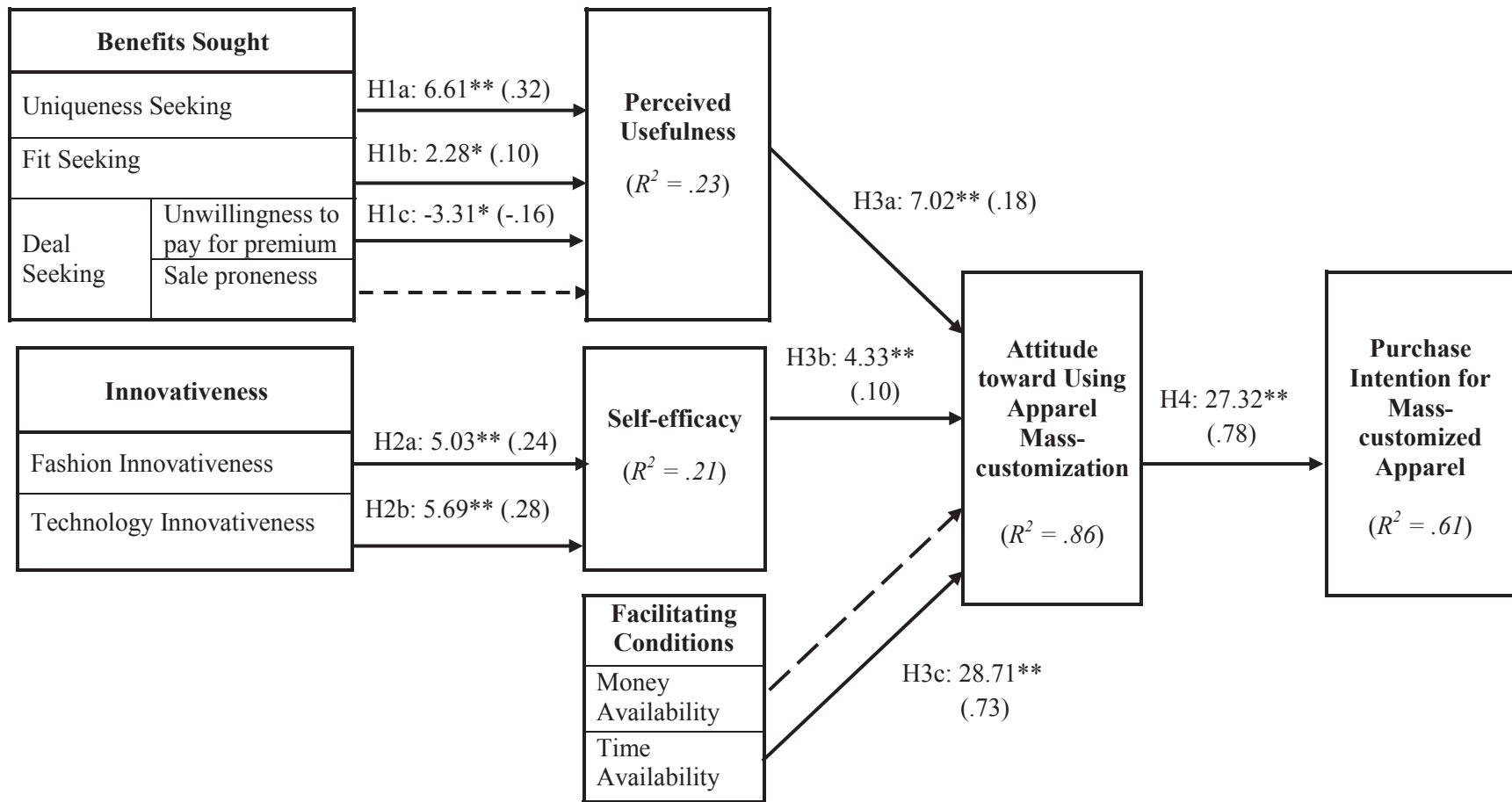
Notes: *t* value and standardized regression coefficients were presented.

A solid line indicated a significant relationship existed between the two variables, and a dash line indicated the two variables were not significant related.

*p<.01, ** *p* <.001

Figure 5.4. Results of Hypotheses Testing from H1 to H 4

Predictors of Purchase Intentions for Mass-customized Apparel

The following section is the discussion of the results from testing Hypotheses 5 to 8, which were formulated to identify the predictors for overall purchase intention for mass-customized apparel and the predictors for each of the three types of customization (i.e., design mass-customization, fit mass-customization, personalization mass-customization) among the proposed variables (i.e., uniqueness seeking, fit seeking, fashion innovativeness, technology innovativeness, perceived usefulness, self-efficacy, facilitating conditions, overall attitude toward using apparel mass-customization) and the demographic variables (i.e., age, educational attainment, annual household income, annual clothing expenditure).

Predictors of Overall Purchase Intention for Mass-customized Apparel (Hypothesis 5)

Hypothesis 5 (H5) was formulated to identify the predictors of overall purchase intention for mass-customized apparel among the variables proposed in the framework and the demographic variables, which was stated as below:

H5   Predictors of overall purchase intention for mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, facilitating conditions of using apparel mass-customization (i.e., money availability, time availability), and overall attitude toward using apparel mass-customization.

The results of the stepwise multiple regression analysis showed that among the 15 independent variables, five (i.e., attitude toward using apparel mass-customization, perceived usefulness of apparel mass-customization, fashion innovativeness, sale proneness, age) contributed to the regression equation (see Table 5.12). The significant F value indicated that this equation was significant in explaining the overall purchase intention for mass-customized apparel [$F(4. 469) = 187.58, p < .001$]. The t-values showed that these five variables significantly contributed to the prediction of overall purchase intention for mass-customized apparel. The coefficient of multiple correlation (R) for this equation was .86 and the square of the

correlation coefficient (R^2) was .67, indicating that 67% of the variance in overall purchase intention for mass-customized apparel was explained by this equation. The standardized regression coefficients (β) showed that attitude toward using apparel mass-customization (β = .52, p <.001) contributed the most in explaining overall purchase intention for mass-customized apparel, followed by perceived usefulness of apparel mass-customization, (β = .26, p <.001), fashion innovativeness (β = .11, p <.001), sale proneness (β = -.07, p <.01), and lastly age (β = .06, p <.05). Considering that the scale of the purchase intention was a four-point Likert type scale where "1" was strongly agree and "4" was strongly disagree, and that the scale of age range was listed from the youngest age bracket where "1" was 20 or younger and "15" was "85 or older", a positive standardized regression coefficient (β) in age variable meant that more of the younger respondents had higher purchase intention for mass-customized apparel. Tolerance values were all greater than 0.1 and VIF values were smaller than 10, indicating that the variables included did not have high multicollinearity (Belsley et al., 1980). The following 10 variables were not included in the equation of this stepwise multiple regression: educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, unwillingness to pay premium, technology innovativeness, self-efficacy in using apparel mass-customization, money availability for apparel mass-customized apparel, and time availability for using apparel mass-customization. These results indicated that the respondents who more favored using apparel mass-customization, who perceived using apparel mass-customization more useful, who were innovative in fashion, who were less sale prone, and who were younger in age, had higher purchase intention for mass-customized apparel.

Table 5.12 Prediction of Overall Purchase Intention for Mass-customized Apparel (Hypothesis 5)

Step and predictor variable	R^2	B	B	t	Tolerance	VIF
Step 1	.61					
Constant		.32				
Attitude toward using apparel mass-customization		.95	.78	27.31***	1	1
Step 2	.65					
Constant		.13				
Attitude toward using apparel mass-customization		.70	.57	13.96***	.45	2.24
Perceived usefulness of apparel mass- customization		.33	.28	6.94***	.45	2.24
Fashion innovativeness	.66					
Constant		-.12				
Attitude toward using apparel mass-customization		.65	.54	13.00***	.43	2.35
Perceived usefulness of apparel mass- customization		.30	.26	6.36***	.44	2.30
Fashion innovativeness		.14	.12	4.07***	.79	1.27
Step 4	.66					
Constant		.06				
Attitude toward using apparel mass-customization		.64	.53	12.84***	.42	2.36
Perceived usefulness of apparel mass-customization		.31	.26	6.51***	.44	2.30
Fashion innovativeness		.14	.12	4.06***	.79	1.27
Sale proneness		-.08	-.06	-2.37**	.99	1.01
Step 5						
Attitude toward using apparel mass-customization	.67	.64	.52	12.67***	.42	2.38
Perceived usefulness of apparel mass-customization		.31	.26	6.45***	.43	2.30
Fashion innovativeness		.13	.11	3.54***	.75	1.33
Sale proneness		-.09	-.07	-2.64**	.97	1.03
Age		.02	.06	1.97*	.87	1.15

Notes: The scale for purchase intention was a 4-point Likert type scale where 1 was strongly agree and 4 was strongly disagree.

The scale for age was listed in the opposite direction where 1 was the youngest age category and 15 was the oldest age category.

$^*p, < .05, ^{**}p < .01, ^{***}p < .001,$

Predictors of Purchase Intention for Design Mass-customized Apparel (Hypothesis 6)

Hypothesis 6 (H6) was formulated to identify the predictors of purchase intention for design mass-customized apparel among the variables proposed in the framework and the demographic variables, which was stated as below:

H6   Predictors of purchase intention for design mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of design mass-customization, self-efficacy in using design mass-customization, facilitating conditions of using design mass-customization (i.e., money availability, time availability), and attitude toward using design mass-customization.

The results of the stepwise multiple regression analysis showed that eight of the 15 independent variables contributed to the regression equation (i.e., attitude toward using design mass-customization, perceived usefulness of design mass-customization, fashion innovativeness, time availability for using design mass-customization, annual clothing expenditure, age, unwillingness to pay premium, annual household income) (see Table 5.13). The significant F value indicated that this equation was significant in explaining purchase intention for design mass-customized apparel [$F(8, 465) = 74.42, p < .001$]. The t-values showed that these eight variables significantly contributed to the prediction of the purchase intention for design mass-customized apparel. The coefficient of multiple correlation (R) for this equation was .75 and the square of the correlation coefficient (R^2) was .56, indicating that 56% of the variance in purchase intention for design mass-customized apparel was explained by this equation. The standardized regression coefficients (β) showed that attitude toward using design mass-customization ($\beta = .32$, $p < .001$) contributed the most in explaining the purchase intention for design mass-customized apparel, followed by perceived usefulness of design mass-customization ($\beta = .21, p < .001$), fashion innovativeness ($\beta = .09, p < .05$), time availability for using design mass-customization ($\beta = .14, p < .05$), annual clothing expenditure ($\beta = -.13, p < .05$), age ($\beta = .08, p < .05$), unwillingness to pay premium ($\beta = -.09, p < .05$), and annual household income ($\beta = .08, p < .05$). As discussed in H5, a positive standardized regression coefficient (β) in age variable

meant that more of the younger respondents had higher purchase intention for mass-customized apparel. Similar to age, the ranges of annual clothing expenditure and annual household income were listed from the lowest level to the highest, and the scale of purchase intention was a four-point Likert type scale where "1" was strongly agree and "4" was strongly disagree. Therefore, a negative β value in annual clothing expenditure indicated that there was a positive relationship between the annual clothing expenditure and the overall purchase intention for mass-customized apparel, and a positive β value in annual household income indicated that there was a negative relationship between the annual household income and the overall purchase intention for mass-customized apparel. Tolerance values were all greater than 0.1 and VIF values were smaller than 10, indicating that the variables included did not have multicollinearity (Belsley et al., 1980). The following seven variables were not included in the equation of this stepwise multiple regression: educational attainment, uniqueness seeking, fit seeking, sale proneness, technology innovativeness, self-efficacy in using design mass-customization, and money availability for design mass-customized apparel. These results indicated that the respondents who had the following characteristics showed higher purchase intention for design mass-customized apparel. They were the respondents who more favored using design mass-customization, who perceived using design mass-customization to be more useful, who were more innovative in fashion, who perceived that they had more available time for using design mass-customization, who spent more for clothing, who were younger in age, who were more willing to pay premium, and who had lower annual household income.

To further understand why the respondents who had lower annual household income had a higher level of purchase intention for design mass-customized apparel, an additional analysis was conducted to examine the association between age and annual household income. Because there were much fewer respondents whose age were in the ranges of 80 – 84 and 85 or older, the data in these two categories were grouped with the age range of 75-79. The results of Kendall's tau-b, a statistics of testing association between two ordinal measures, showed that age and annual household income were correlated (tau-b = .11, Approx. t = 3.09, p <.01). These results showed that younger respondents had lower annual income compared to the older respondents. Considering that younger respondents were found to have higher purchase intention, these findings further illustrated that younger respondents who earned less annual household income had higher purchase intention for design mass-customized apparel.

Table 5.13 Prediction of Purchase Intention for Design Mass-customized Apparel (Hypothesis 6)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Step 1	.42					
Constant		.89				
Attitude toward using design mass-customization		.76	.65	18.52***	1	1
Step 2	.49					
Constant		.60				
Attitude toward using design mass-customization		.50	.43	10.07***	.59	1.69
Perceived usefulness of design mass-customization		.38	.34	7.94***	.59	1.69
Step 3	.53					
Constant		.14				
Attitude toward using design mass-customization		.45	.39	9.21***	.57	1.75
Perceived usefulness of design mass-customization		.30	.27	6.28***	.55	1.83
Fashion innovativeness		.26	.22	6.04***	.77	1.30
Step 4	.54					
Constant		.07				
Attitude toward using design mass-customization		.39	.34	7.58***	.50	1.98
Perceived usefulness of design mass-customization		.25	.23	5.23***	.51	1.97
Fashion innovativeness		.25	.21	5.82***	.77	1.31
Time availability for design mass-customization		.15	.14	3.33**	.59	1.69
Step 5	.55					
Constant		.39				
Attitude toward using design mass-customization		.38	.33	7.41***	.50	1.99
Perceived usefulness of design mass-customization		.25	.22	5.13***	.51	1.97
Fashion innovativeness		.21	.17	4.59***	.69	1.46
Time availability for using design mass-customization		.15	.14	3.35**	.59	1.69
Annual clothing expenditure		-.03	-.11	-3.03**	.81	1.23
Step 6	.55					
Constant		.33				
Attitude toward using design mass-customization		.37	.32	7.17***	.50	2.01
Perceived usefulness of design mass-customization		.24	.21	4.90***	.50	1.99
Fashion innovativeness		.18	.15	3.89***	.65	1.54
Time availability for using design mass-customization		.16	.15	3.65***	.59	1.71

	R^2	B	β	t		VIF
Annual clothing expenditure		-.03	-.11	-3.18**	.81	1.23
Age		.02	.09	2.63**	.88	1.14
Step 7	.56					
Constant		.15				
Attitude toward using design mass-customization		.37	.31	7.19***	.50	2.01
Perceived usefulness of design mass-customization		.23	.21	4.82***	.50	1.99
Fashion innovativeness		.13	.11	2.44*	.51	1.96
Time availability for using design mass-customization		.15	.14	3.39**	.58	1.73
Annual clothing expenditure		-.02	-.09	-2.69**	.78	1.29
Age		.03	.09	2.81*	.87	1.14
Unwillingness to pay premium		-.14	-.09	-2.19*	.58	1.74
Step 8	.56					
Constant		.02				
Attitude toward using design mass-customization		.37	.32	7.24***	.50	2.01
Perceived usefulness of design mass-customization		.23	.21	4.84***	.50	1.99
Fashion innovativeness		.11	.09	2.11*	.50	2.00
Time availability for using design mass-customization		.15	.14	3.49**	.58	1.74
Annual clothing expenditure		-.03	-.13	-3.36**	.63	1.59
Age		.02	.08	2.51*	.86	1.16
Unwillingness to pay premium		-.14	-.09	-2.29*	.58	1.74
Annual household income		.03	.08	2.16*	.77	1.30

Notes: The scale for purchase intention was a 4-point Liket type scale where 1 was strongly agree and 4 was strongly disagree.

The scales for age, annual household income and annual clothing expenditure were listed from the youngest or lowest category to the oldest or highest category.

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

Predictors of Purchase Intention for Fit Mass-customized Apparel (Hypothesis 7)

Hypothesis 7 (H7) was formulated to identify the predictors of fit mass-customized apparel among the variables proposed in the framework and the demographic variables included in the study, which was stated as below:

H7 Predictors of purchase intention for fit mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of fit mass-customization, self-efficacy in using fit mass-customization,

facilitating conditions of using fit mass-customization (i.e., money availability, time availability), and attitude toward using fit mass-customization.

The results of the stepwise multiple regression analysis showed that five of the 15 independent variables contributed to the regression equation (i.e., attitude toward using fit mass-customization, time availability for using fit mass-customization, perceived usefulness of fit mass-customization, fashion innovativeness, age). (See Table 5.14). The significant F value indicated that this equation was significant in explaining the purchase intention for fit mass-customized apparel [$F(5, 468) = 100.53, p < .001$]. The t-values showed that these five variables significantly contributed to the prediction of the purchase intention for fit mass-customized apparel. The coefficient of multiple correlation (R) for this equation was .72 and the square of the correlation coefficient (R^2) was .52, indicating that 52% of the variance in purchase intention for fit mass-customized apparel was explained by this equation. The standardized regression coefficients (β) showed that attitude toward using fit mass-customization ($\beta = .26, p < .001$) contributed the most in explaining the purchase intention for fit mass-customized apparel, followed by time availability for using fit mass-customization ($\beta = .27, p < .001$), perceived usefulness of fit mass-customization ($\beta = .18, p < .001$), fashion innovativeness ($\beta = .17, p < .001$), and age ($\beta = .12, p < .05$). Tolerance values were all greater than 0.1 and VIF values were smaller than 10, indicating that the variables included did not have high multicollinearity (Belsley et al., 1980). The following 10 variables were not included in the equation of this stepwise multiple regression: educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, unwillingness to pay for premium, sale proneness, technology innovativeness, self-efficacy in using fit mass-customization, and money availability for fit mass-customized apparel. These results indicated that the respondents who more favored fit mass-customization, who had more time available for fit mass-customization, who were more innovative in fashion, who perceived using fit mass-customization to be more useful, and who were younger in age, had higher purchase intention for fit mass-customized apparel.

Table 5.14   Prediction of Purchase Intention for Fit Mass-customized Apparel (Hypothesis 7)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Step 1	.37					
Constant		.88				
Attitude toward using fit mass-customization		.72	.61	16.51**	1	1
Step 2	.44					
Constant		.52				
Attitude toward using fit mass-customization		.49	.41	9.91**	.68	1.47
Time availability for using fit mass-customization		.38	.34	8.09**	.68	1.47
Step 3	.49					
Constant		-.04				
Attitude toward using fit mass-customization		.44	.37	9.03**	.66	1.52
Time availability for using fit mass-customization		.33	.29	7.12**	.66	1.53
Fashion innovativeness		.28	.23	6.33**	.87	1.16
Step 4	.51					
Constant		-.11				
Attitude toward using fit mass-customization		.32	.27	5.86**	.49	2.03
Time availability for using fit mass-customization		.30	.26	6.49**	.64	1.56
Fashion innovativeness		.25	.20	5.64**	.84	1.19
Perceived usefulness of fit mass-customization		.22	.19	4.22**	.54	1.84
Step 5	.52					
Constant		-.20				
Attitude toward using fit mass-customization		.31	.26	5.75**	.49	2.03
Time availability for using fit mass-customization		.31	.27	6.71**	.64	1.57
Fashion innovativeness		.21	.17	4.66**	.79	1.27
Perceived usefulness of fit mass-customization		.21	.18	4.03**	.54	1.85
Age		.03	.12	3.40*	.90	1.12

Notes: The scale for purchase intention was a 4-point Likert type scale where 1 was strongly agree and 4 was strongly disagree.

The scale for age was listed in the opposite direction where 1 was the youngest age category and 15 was the oldest age category.

*p,< .05, **p < .001

Predictors of Purchase Intention for Personalization Mass-customized Apparel (Hypothesis 8)

Hypothesis 8 (H8) was formulated to identify the predictors of purchase intention for personalization mass-customized apparel among the variables proposed in the framework and the demographics, which was stated as below:

H8　Predictors of purchase intention for personalization mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of personalization mass-customization, self-efficacy in using personalization mass-customization, facilitating conditions of using personalization mass-customization (i.e., money availability, time availability), and attitude toward using personalization mass-customization.

The results of the stepwise multiple regression analysis showed that seven of the 15 independent variables contributed to the regression equation (i.e., attitude toward using personalization mass-customization, fashion innovativeness, time availability for using personalization mass-customization, age, perceived usefulness of personalization mass-customization, annual household income, annual clothing expenditure) (see Table 5.15). The significant F value indicated that this equation was significant in explaining purchase intention for personalization mass-customized apparel [$F(7, 466) = 87.70, p < .001$]. The t-values showed that these seven variables significantly contributed to the prediction on purchase intention for fit mass-customized apparel. The coefficient of multiple correlation (R) for this equation was .75 and the square of the correlation coefficient (R^2) was .57, indicating that 57% of the variance in purchase intention for personalization mass-customized apparel was explained by this equation. The standardized regression coefficients (β) showed that attitude toward using personalization mass-customization ($\beta = .41, p < .001$) contributed the most in explaining the purchase intention for personalization mass-customized apparel, followed by fashion innovativeness ($\beta = .20, p < .001$), time availability for using personalization mass-customization ($\beta = .16, p < .001$), age ($\beta = .09, p < .01$), perceived usefulness of personalization mass-customization ($\beta = .10, p < .05$), annual household income ($\beta = .10, p < .01$), and annual clothing expenditure ($\beta = -.08, p < .05$).

Considering that the scale of purchase intention was a four-point Likert type scale where "1" was strongly agree and "4" was strongly disagree, and the scales for annual household income was listed in the order from lower income to higher income, positive standardized regression coefficient (β) found in annual household income meant that there was a negative correlation between the annual household income and the purchase intention for personalization mass-customized apparel. In other words, the respondents who had lower annual household income level had higher purchase intention for personalization mass-customized apparel. For the same reason, a negative standardized regression coefficient (β) in annual clothing expenditure meant that there was a positive correlation between annual clothing expenditure and purchase intention for personalization mass-customized apparel. In other words, the respondents who spent more money in clothing had higher purchase intention for personalization mass-customized apparel. Tolerance values were greater than 0.1 and VIF values were smaller than 10, indicating that the variables included in the regression equation did not have multicollinearity (Belsley et al., 1980). The following eight variables were not included in the equation of this stepwise multiple regression: educational attainment, uniqueness seeking, fit seeking, unwillingness to pay premium, sale proneness, technology innovativeness, self-efficacy in using personalization mass-customization, and money availability for personalization mass-customized apparel. These results indicated that the respondents who had the following characteristics had higher purchase intention for personalization mass-customized apparel. Those who had higher purchase intention for personalization mass-customized apparel more favored personalization mass-customization, were more innovative in fashion, had more time available for personalization mass-customization, were younger in age, perceived using personalization mass-customization more useful, had lower annual household income level, but spent more money as clothing expenditure.

Table 5.15   Prediction of Purchase Intention for Personalization Mass-customized Apparel (Hypothesis 8)

Step and predictor variable	R^2	B	β	t	Tolerance	VIF
Step 1	.46					
Constant		.93				
Attitude toward using personalization mass-customization		.78	.68	20.03***	1	1
Step 2	.53					
Constant		.20				
Attitude toward using personalization mass-customization		.64	.56	16.00***	.83	1.21
Fashion innovativeness		.37	.29	8.32***	.83	1.21
Step 3	.55					
Constant		.10				
Attitude toward using personalization mass-customization		.54	.47	11.58***	.59	1.69
Fashion innovativeness		.35	.27	7.92***	.82	1.23
Time availability for using personalization mass-customization		.18	.16	4.13***	.64	1.57
Step 4	.56					
Constant		.02				
Attitude toward using personalization mass-customization		.52	.45	11.18***	.58	1.72
Fashion innovativeness		.31	.25	7.00***	.77	1.30
Time availability for using personalization mass-customization		.18	.17	4.33***	.64	1.57
Age		.03	.11	3.21**	.89	1.12
Step 5	.56					
Constant		-.21				
Attitude toward using personalization mass-customization		.47	.41	9.44***	.50	2.01
Fashion innovativeness		.29	.23	6.36***	.73	1.36
Time availability for using personalization mass-customization		.17	.15	3.88***	.62	1.62
Age		.03	.10	3.21**	.89	1.12
Perceived usefulness of personalization mass-customization		.11	.10	2.46**	.59	1.69
Step 6	.57					
Constant		-.24				
Attitude toward using personalization mass-customization		.48	.42	9.63***	.49	2.04
Fashion innovativeness		.29	.23	6.40***	.73	1.36
Time availability for using personalization mass-customization		.17	.16	4.00***	.62	1.62
Age		.03	.09	2.87**	.87	1.15
Perceived usefulness of personalization mass-customization		.10	.10	2.43*	.59	1.69
Annual household income		.03	.06	2.06*	.96	1.05

Step 7					
Constant	-.09				
Attitude toward using personalization mass-customization	.48	.41	9.52***	.49	2.04
Fashion innovativeness	.26	.20	5.27***	.64	1.56
Time availability for using personalization mass-customization	.17	.16	3.99***	.62	1.62
Age	.03	.09	2.84**	.87	1.15
Perceived usefulness of personalization mass-customization	.10	.10	2.43*	.59	1.69
Annual household income	.05	.10	2.76*	.77	1.30
Annual clothing expenditure	-.02	-.08	-2.06*	.65	1.54

Notes: The scale for purchase intention was a 4-point Liket type scale where 1 was strongly agree and 4 was strongly disagree.

The scales for age, annual household income and annual clothing expenditure were listed from the youngest or lowest category to the oldest or highest category.

$^*p < .05,\ ^{**}p < .01,\ ^{***}p < .001$

Summary of Results of Statistical Analysis to Identify Predictors of Each of the Four Types of Mass-customized Apparel (H5 – H8)

Table 5.16 was used to summarize the results of the statistical analyses to identify the predictors of overall purchase intention for mass-customized apparel and the predictors of purchase intention for each of the three types of mass-customized apparel (i.e., design mass-customized apparel, fit mass-customized apparel, personalization mass-customized apparel) among all the proposed variables and the demographic variables. All four hypotheses (H5 to H8) were partially supported.

Table 5.16 Predictors of Purchase Intention for Mass-customized Apparel

H5 Predictors of overall purchase intention for mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of apparel mass-customization, self-efficacy in using apparel mass-customization, facilitating conditions of using apparel mass-customization (i.e., money availability, time availability), and overall attitude toward using apparel mass-customization.	
Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 5
1. Attitude toward using apparel mass-customization 2. Perceived usefulness of apparel mass-customization in general 3. Fashion innovativeness 4. Sale proneness 5. Age	H5 was partially supported. The respondents who more favored using apparel mass-customization, who perceived using apparel mass-customization more useful, who were innovative in fashion, who were less sale prone, and who were younger in age, had higher purchase intention for mass-customized apparel.

H6	Predictors of purchase intention for design mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of design mass-customization, self-efficacy in using design mass-customization, facilitating conditions of using design mass-customization (i.e., money availability, time availability), and attitude toward using design mass-customization.
Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 6
1. Attitude toward using design mass-customization 2. Perceived usefulness of design mass-customization 3. Fashion innovativeness 4. Time availability for design mass-customization 5. Annual clothing expenditure 6. Age 7. Unwillingness to pay premium 8. Annual household income	H6 was partially supported. The respondents who showed higher purchase intention for design mass-customized apparel were those who more favored using design mass-customization, who perceived using design mass-customization to be more useful, who were innovative in fashion, who perceived that they had more available time for using design mass-customization, who spent more in clothing, who were younger in age, who were willing to pay premium, and who had lower annual household income.

H7	Predictors of purchase intention for fit mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of fit mass-customization, self-efficacy in using fit mass-customization, facilitating conditions of using fit mass-customization (i.e., money availability, time availability), and attitude toward using fit mass-customization.
Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 7
1. Attitude toward using fit mass-customization 2. Time availability for fit mass-customization 3. Fashion innovativeness 4. Perceived usefulness of fit mass-customization 5. Age	H7 was partially supported. The respondents who more favored fit mass-customization, who had more time available for fit mass-customization, who were innovative in fashion, who perceived using fit mass-customization to be more useful, and who were younger in age, had higher purchase intention for fit mass-customized apparel.

H8	Predictors of purchase intention for personalization mass-customized apparel are: age, educational attainment, annual household income, annual clothing expenditure, uniqueness seeking, fit seeking, deal seeking (i.e., unwillingness to pay premium, sale proneness), fashion innovativeness, technology innovativeness, perceived usefulness of personalization mass-customization, self-efficacy in using personalization mass-customization, facilitating conditions of using personalization mass-customization (i.e., money availability, time availability), and attitude toward using personalization mass-customization.
Significant variables based on relative magnitudes of the standardized regression coefficients	Conclusion for Hypothesis 8
1. Attitude toward using personalization mass-customization 2. Fashion innovativeness 3. Time availability for using personalization mass-customization 4. Age 5. Perceived usefulness of personalization mass-customization 6. Annual household income 7. Annual clothing expenditure	H8 was partially supported. The respondents who had higher purchase intention for personalization mass-customized apparel more favored personalization mass-customization, were innovative in fashion, had more time available for using personalization mass-customization, were younger in age, perceived using personalization mass-customization more useful, had lower annual household income level, but spent more money as clothing expenditure.

CHAPTER VI
DISCUSSION, IMPLICATION, LIMITATION, RECOMMENDATION
FOR FUTURE RESEARCH AND CONCLUSIONS

This chapter provides discussions and implications based on the results drawn from the statistical analyses presented in the previous chapter. Limitations of the current study were addressed and suggestions were exemplified accordingly for the future research. A conclusion of the study was stated to summarize how the findings of this study may contribute to the academia and benefit the apparel marketers. The current chapter included four sections. In the first section, the characteristics of the respondents of the current study were discussed. The second section, purchase intention for mass-customized dress shirts, explained the probability of the respondents making a purchase of mass-customized dress shirts. The third section is the discussion of hypotheses testing results based on the conceptual framework. This part consists of the following three subsections: (a) the framework testing, (b) the relationships among the variables in the framework, and (c) the predictors of purchase intention for mass-customized apparel. In the fourth section, some of the limitations of the study were addressed and recommendations were made based on the limitations for the future research. The last section is the conclusions of the study.

Characteristics of the Respondents of the Current Study

Many previous studies related to apparel consumer behavior have focused on understanding the female apparel consumer behavior and there fore, there is limited literature in apparel consumer behavior, which used male as the subjects of the study. An examination of male apparel consumers' clothing expenditure, frequency of wearing dress shirts, benefits sought such as uniqueness seeking, fit seeking, and deal seeking, and innovativeness such as fashion

innovativeness and technology innovativeness was lacking in the related previous literature. The respondents of the current study were male adults of age 20 or older who resided in the United States and who held an occupation in either one of the two U.S. Census occupation categories, (a) Sales and Office occupations or (b) Management, Professional and related occupations. Although the sample was not randomly selected, it was a sample selected from the panel members nationwide. The findings of the characteristics of the respondents in this study may bring some light to understanding apparel consumer behavior among the specific male consumer segment where the consumers have the above-described demographic characteristics. The findings of the study may help the apparel marketers to establish the bases for developing marketing strategies that are catered to male apparel consumers.

The distribution of age in the current study was similar to the U.S. male population, except the percentage in the age category of 35-44, which seemed to be significantly higher than the percentage reported in the U.S. Census. Majority of the respondents were White/Caucasian and were highly educated. In addition, they had a relatively higher annual household income than that of the general U.S. population. Majority of the respondents' annual expenditure in clothing ranged from $100 to $599; more than a quarter of the respondents' expenditure in clothing ranged from $600 to more than $5,000. Over half of the respondents wore dress shirts at least once a week and over a quarter of the respondents wore dress shirts on a daily basis. On average, they were sale prone, were seeking better-fitting apparel products and innovative in adopting new technologies. They expressed neutral responses about seeking uniqueness, about demonstrating his individuality through clothing, and about unwillingness to pay extra for the products that they desire. They were not innovative in adopting new fashion.

Purchase Intention for Mass-customized Dress Shirts

The results of the distribution of overall purchase intention for mass-customized dress shirts showed that over half of the respondents were likely to purchase mass-customized dress shirts. This result was consistent with the previous studies, which indicated that consumers were willing to adopt mass-customization in general (Cho & Fiorito, 2009; Choy & Loker, 2004; Fiore et al., 2004; Goldsmith & Freiden, 2004; Lee et al., 2002). In addition, the results are also consistent with Goldsmith and Freiden's results that consumers perceived dressy clothing to be

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more appropriate for mass-customization. Considering men's dress shirts as dressy clothing, these results provide a support that implementing apparel mass-customization on dressy clothing such as dress shirts may be appropriate.

The results showed that more respondents were willing to purchase fit mass-customized dress shirts than they were willing to purchase design mass-customized dress shirts, and personalization mass-customized dress shirts. These results are consistent with the comparison results of the purchase intention for mass-customized apparel of the three types, indicating that the respondents had the highest degree of intentions to purchase fit mass-customized apparel followed by design mass-customized apparel, and had the least intentions to purchase personalization mass-customized apparel. The mean score of the measures in fit seeking and the respondent's answers to the relevant open-ended questions might have provided explanations for the reasons why they had higher purchase intentions for fit mass-customized dress shirts than did for the other two types of mass-customized dress shirts. The respondents' answers showed that they had a difficulty in finding the right fit from the ready-to-wear dress shirt stores and were seeking a better fit in clothing, and therefore, were more willing to purchase fit mass-customized dress shirts than the other two types of mass-customized dress shirts. This reason can also be supported by previous studies, which reported that many consumers were not fully satisfied with the fit of ready-to-wear garments in the market and that there was a need for better fit of the apparel products that they buy (De Klerk & Tselepis, 2007; Endo &Kincade, 2005; Fiore et al., 2003; Howarton & Lee, 2010; Pisut & Connell, 2007; Workman & Lentz, 2000). A possible reason for the lowest purchase intention for personalization mass-customized dress shirts among the respondents could be found in some respondent's answers to the relevant open-ended question**.** They mentioned that they simply did not care for using the personalization mass-customization because they did not think it was a necessary feature on the garment.

Higher purchase intention for fit mass-customized dress shirts suggest that the manufacturers or retailers that provide men's dress shirts may want to consider making more efforts in providing fit mass-customized dress shirts to fulfill male customers' needs in finding better-fitting dress shirts, which may be difficult to find from ready-to-wear dress shirt stores. In order to attract new customers of fit mass-customized dress shirts, apparel manufacturers or retailers may want to inform their customers about the availability of the fit mass-customization option. For example, if a retail sales staff notices that a customer cannot find a well-fitting dress

shirt in the store, the sales staff may inform the customer about the option of fit mass-customization. The apparel company may also make a public relations effort by promoting fit mass-customization option at an event, such as business conferences, where potential customers of fit mass-customized dress shirt may gather. In order to retain existing customers of mass-customized apparel, apparel manufacturers or retailers may make better efforts to increase customers' satisfaction in using fit mass-customization. For example, they may try to identify and keep the records of the information regarding the specific areas where the customer has a difficulty in finding the right fit, or they may provide assistance to obtain necessary body measurements needed for manufacturing fit mass-customized dress shirts.

Discussions on the Results of Hypotheses Testing

A conceptual model was built as the framework of the study, and 10 variables were included in the framework. A total of eight hypotheses were extracted based on the conceptual framework. The first four hypotheses tested the relationships between variables included in the conceptual framework, and the rest of the four hypotheses were extracted in order to identify the predictors of overall purchase intention for mass-customized apparel and purchase intention for three types of mass-customized apparel (i.e. design mass-customization, fit mass-customization, personalization mass-customization).

Framework Testing

The conceptual framework of the current study was developed based upon the Technology Acceptance Model (Davis, 1989) and the Theory of Planned Behavior (Ajzen, 1991; Taylor & Todd, 1995). The results provide evidence that the Technology Acceptance Model and the Theory of Planned Behavior can be applied to consumer behavior in the specific domain of shopping mass-customized apparel. The results of this study found a significant relationship between consumer characteristics and perceived usefulness, and a relationship between perceived usefulness and attitude toward using apparel mass-customization. Both relationships were parts of the postulations from the Technology Acceptance Model. In addition, a significant relationship between consumer characteristics and perceived behavioral control (i.e., self-

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efficacy, facilitating conditions), and a relationship between perceived behavioral control and attitude toward using apparel mass-customization were found. Both relationships were proposed in the Theory of Planned Behavior. The relationship between attitude and behavioral intention was included in both the Technology Acceptance Model and the Theory of Planned Behavior, and the results of the current study also found this relationship to be significant.

Limited studies regarding the purchase intention for mass-customized apparel were conducted based on a theory or a on a theory-based model. Cho and Fiorito (2009) applied the Technology Acceptance Model to identify the predictors of attitude toward online mass-customized jeans. Though Cho and Fiorito examined the relationship between perceived usefulness and perceived ease of use, and attitude toward online mass-customization on jeans, they did not examine the roles of some relevant consumer characteristics such as benefits sought and innovativeness, and facilitating conditions such as money and time availability. They also did not examine the relationship between attitude and purchase intention. The framework of the current study further the understanding of male consumers' purchase intention for mass-customized dress shirts and it may be used as a framework for further research in mass-customization.

<u>Relationships among the Variables in the Framework</u>

The following sections discuss the results of the study and present the implications based on the results. The discussions were based on the structure of the conceptual framework, which were in the order of (a) the relationships between benefits sought and perceived usefulness, (b) the relationships between consumer innovativeness and self-efficacy, (c) the relationships of attitude toward using apparel mass-customization with perceived usefulness, self-efficacy, and facilitating conditions, and (d) the relationship between attitude toward using apparel mass-customization and purchase intention for mass-customized apparel.

Relationships between Benefits Sought and Perceived Usefulness

The results showed that the respondents who sought uniqueness in clothing, who were willing to pay premium (i.e., who were not deal seekers), and who sought better fit in clothing perceived apparel mass-customization to be more useful. Among these three types of benefit

sought, uniqueness seeking played the most important role in explaining the perceived usefulness of apparel mass-customization. These results support Hart's (1995) argument that when a consumers' need for uniqueness is high, the consumer will demand mass-customized product. Similar to Hart's argument, Raddar and Louw (1999) suggested that, to be successful in mass-customized apparel marketing, it is crucial for the manufacturer to consider consumers' need for uniqueness and to assure that the mass-customized products that they offer can fulfill customers' need for uniqueness. The reason why consumers who seek uniqueness perceive apparel mass-customization useful may be that they want to shape their unique personal image through purchasing and wearing mass-customized clothing. By using apparel mass-customization, they can purchase a clothing item that can express their individuality or an item that is not too popular among the general public.

Another significant type of benefit sought that predicted the usefulness of apparel mass-customization was unwillingness to pay premium. The finding of a negative relationship between unwillingness to pay premium and perceived usefulness of apparel mass-customization is consistent with Bardakci and Whitelock's (2004) and Kamali and Loker (2002)'s studies, which found a positive relationship between consumers' willingness to pay premium and attitude toward using apparel mass-customization.

The above results implies that helping the consumers realize that it is worth paying a premium for mass-customized apparel may be a key to apparel marketers' success in attracting customers to use apparel mass-customization. The consumers who are not willing to pay premium do not believe that there is a strong relationship between the price they pay and the satisfaction that they receive from the product they purchased. For these consumers, the marketer may develop strategies to change their perception about paying a premium (Blackwell, Engel, & Miniard, 2001) and help them to see the benefits of paying extra money for a mass-customized apparel item and why the investment is worth it. One important message to convince why paying the premium for mass-customized clothing is worth the investment is that paying the premium for the mass-customization option can better satisfy their needs for uniqueness or for better fit because the results showed that uniqueness seeking and fit seeking were two of the predictors of perceived usefulness of using apparel mass-customization. For example, in promotional materials, the messages and pictures could emphasize how mass-customized apparel can create their own unique style or how well-fitting the mass-customized apparel can be. Including

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testimonials of customers that testify how mass-customization option can create a distinctive personal image or can overcome the frustration of not being able to find the right fit off the rack, would be also assertive to the potential customers who want to communicate their uniqueness and shape their unique identity through what they wear, or to those who have a hard time finding the right fit from ready-to-wear clothing stores.

Relationships between Consumer Innovativeness and Self-efficacy

The findings of the relationship between consumer innovativeness and self-efficacy in using apparel mass-customization showed that the respondents who were more innovative in terms of technology and fashion were more self-confident in using apparel mass-customization. The result that consumers who were more innovative in adopting new technology were more likely to be self-confident in using apparel mass-customization is consistent with previous studies such as Parveen and Sulaiman (2008) and Venkatesh and Davis (2000). These researchers found that consumers' technology innovativeness had a positive relationship with perceived ease of or self-efficacy in using new information technology. In terms of the relationship between fashion innovativeness and self-efficacy, the findings showed that fashion innovators perceived apparel mass-customization process as easy and they were self-confident in using apparel mass-customization. This result is consistent with the conclusion drawn from the study results Goldsmith et al. (1996), and Goldsmith, (2000) that fashion innovators were more likely to have higher confidence in shopping apparel. The relationship between fashion innovators and self-efficacy not only can be applied to general apparel shopping but also to the specific domain of apparel mass-customization.

These results suggest that apparel mass-customization can be first targeted to consumers who are innovative in technology and fashion because they have a higher degree of self-confidence in using apparel mass-customization than the consumers who are not as innovative in technology and fashion. Once apparel mass-customization is adopted by the innovative consumer segment, then the innovators may become a reference group to other consumer segments (i.e. early majority, late majority, laggards). The innovative consumers may spread their perceptions of the process of apparel mass-customization to be easy, to the other consumers. In this way, apparel mass-customization, first used by the innovators of technology and fashion, may be diffused into larger consumer segments (Kotler & Armstrong, 2010; Peter & Olson, 2005). For

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example, apparel companies that offer mass-customized apparel may target the innovators by providing incentives to try mass-customization option by issuing coupons for purchasing mass-customized apparel products for the first time**.** After the innovators used the mass-customization option, the company can encourage these customers as opinion leaders to leave feedback comments on the company website about how easy it is to use apparel mass-customization by providing incentives such as coupons or points toward the next purchase to those who submit a feedback comment on the website. The feedback from the innovators may help other customers increase confidence in using mass-customization process. Using new technologies as a tool, such as developing a smart phone application to view design options and to perform mass-customization may be an effective way to promote mass-customized apparel to technology innovators. Fashion innovators tend to obtain the latest information about fashion trends (Goldsmith, 2000)**,** and thus, apparel marketers may include a print advertisement in fashion magazines to deliver messages that can be appealing to the fashion innovators. An illustration of a model wearing fashionable-looking mass-customized apparel with the information about the mass-customization option on the advertisement may be a useful promotional message. Such information may increase fashion innovators' awareness about apparel mass-customization and may attract them to adopt the new option in buying apparel.

Relationships of Attitude toward Using Apparel Mass-customization with Perceived Usefulness, Self-efficacy and Facilitating Conditions

The respondents who perceived that they had more time to use apparel mass-customization, that apparel mass-customization to be more useful, and that they were more self-confident in using apparel mass-customization, showed more favorable attitude toward using apparel mass-customization. These results support the Technology Acceptance Model which proposed the relationship between perceived usefulness and perceived ease of use, and attitude toward adopting a new technology. These results are also consistent with several previous studies of which the conceptual framework was based on the Technology Acceptance Model. Cho and Fiorito's (2009) reported that the perceived usefulness of apparel mass-customization had a positive relationship with attitude toward using online mass-customization, in the product category of jeans. Kim et al. (2009) also found that perceived usefulness of mobile technology was a predictor of attitude toward mobile communication and mobile commerce for purchasing

fashion goods. However, the results partially support the Theory of Planned Behavior because only one type of facilitating conditions, time availability was found to have a significant relationship with attitude toward using apparel mass-customization. No relationship was found between money availability and attitude toward using apparel mass-customization.

Among the three predictors of attitude toward using apparel mass-customization, (i.e. perceived usefulness, self-efficacy, time availability), the standardized regression coefficients showed that the time availability contributed much more than the other two predictors in explaining attitude toward using apparel mass-customization. This information can help the apparel marketers to identify the focus of marketing activities and to prioritize the content of the message in their marketing communications, in the process of making the targeted consumers to form a favorable attitude toward apparel mass-customization. These results suggest that developing an effective mass-customization process to allow the customers to finish the process in a short period time is important to males' customers. For example, in online apparel mass-customization, apparel marketers may create a website that is easy to navigate so that customers can easily find the preferred options for the design mass-customization and personalization mass-customization. Trend tips and recommendations for how to make a choice can be provided to help customers in their selection to reduce the time for decision making. In a brick-and-mortar retail store, a sales staff can make suggestions on the options to select. In addition to that, the sale staff's prompt and efficient may help the customers to place an order in a way that the customer does not feel that it take a long time to go through the process of apparel mass-customization.

The consumers who do not have experience in using the apparel mass-customization option may have an inaccurate concept that purchasing mass-customized apparel requires a long time. To increase consumers' favorable attitudes toward apparel mass-customization, the marketers may want to inform consumers the approximate duration of time to engage in the process of apparel mass-customization so that they have an accurate perception about the time needed for using apparel mass-customization. With effective marketing communications, marketers can help the consumers form an impression that ordering mass-customized apparel is only a few clicks away,

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Relationship between Attitude toward Using Apparel Mass-customization and Purchase Intention for Mass-customized Apparel

The relationship between attitude and purchase intention proposed by the Technology Acceptance Model and the Theory of Planned Behavior, has been investigated by many previous studies, and the results of the previous studies showed that when the respondents had a positive attitude toward an object or activity, they were more willing to purchase a product (Belleau et al., 2007; Dickson, 2000; Kim & Forsythe, 2008; Park & Kim, 2007; Shen et al., 2003; Wang et al., 2007). The current study also showed a consistent result with these previous studies, suggesting that a consumer who favors apparel mass-customization is more likely to purchase mass-customized apparel. Therefore, after assisting consumers to form favorable attitudes, it is important to turn consumers' positive attitude to purchase intention because purchase intention is the precedence of actual purchase behavior (Fishbein & Ajzen, 1975). To help consumers to transfer their favorable attitude to purchase intention, the marketer may send email to inform store locations, provide a link to the webpage where online mass-customization is offered, or send email alerts to notify new mass-customized product information and sale information. Above-listed information may provide assistance or stimuli to motivate consumers to purchase mass-customized apparel.

<u>Predictors of Purchase Intention for Mass-customized Apparel</u>

The following sections include discussions of the common and different predictors among the four different types of mass-customized apparel (i.e., overall purchase intention for mass-customized apparel, purchase intention for design mass-customized apparel, purchase intention for fit mass-customized apparel, purchase intention for personalization mass-customized apparel). Possible reasons for the differences and relevant marketing implications were provided.

Common Predictors of Purchase Intention for All Types of Mass-customized Apparel

The results from identifying the predictors of purchase intention for all types of mass-customized apparel (i.e. overall purchase intention for mass-customized apparel, purchase intention for design mass-customized apparel, purchase intention for fit mass-customized apparel

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purchase intention for personalization mass-customized apparel) indicated that the attitude toward using specific type of apparel mass-customization was always the most important predictor. Perceived usefulness, fashion innovativeness and age were also entered as the predictors in all regression models for all types of purchase intention for mass-customized apparel. These results suggest that the consumers who are younger and innovative in fashion; perceive apparel mass-customization to be useful; and favor using apparel mass-customization are more likely to purchase mass-customized apparel, in general, regardless of the types of apparel mass-customization.

The result related to age was consistent with Goldsmith and Freiden's (2004) report that the consumers who were willing to adopt mass-customization were younger in age. Younger consumers, such as the consumers who fall into the age cohort of Generation Y, are savvier in using various technologies and are exposed to various types of information sources (Kotler & Armstrong, 2010). These characteristics of younger consumers may increase the probability of adopting a novel way of shopping apparel such as apparel mass-customization. Therefore, these younger consumers may be targeted for promoting apparel mass-customization, using up-to-date technological media (e.g. social media, smart phone application) to deliver the promotional message.

Fashion innovativeness was a predictor not only for the purchase intention for design mass-customized apparel but also for the purchase intention for fit and personalization mass-customized apparel. Goldsmith et al.'s (1996) study, when fashion innovators evaluated their self-image, they rated themselves as vainer than relatively modest fashion followers, which can be interpreted that they cared more about their appearance and image than did the fashion followers. This characteristic of fashion innovators may explain why fashion innovativeness was a predictor for the purchase intention for all three types of mass-customization apparel. The respondents who were fashion innovative might have perceived that all three types of mass-customization apparel could enhance their appearance and image through wearing the well-designed and well-fitting apparel products. Personalized design features such as a monogram might have also been perceived as a way to show their pride in their appearance and image.

The findings of these predictors of purchase intention for mass-customized apparel are unique to this study, and they fill the gaps of literature related to apparel mass-customization. In addition to the contribution to knowledge building, identification of the predictors of purchase

intention for mass-customized apparel may also bring benefits to the marketers of mass-customized apparel. The main advantage of using stepwise regression analyses is to identify the best predictors among the variables included in the regression equation, which can help the marketers to prioritize their marketing efforts to develop and implement the most effective marketing strategies and to efficiently use the resources and time to achieve the company's objectives such as increasing consumers' favorable perceptions about their mass-customized apparel or increasing the chances that the consumers try and repeatedly purchase their mass-customized apparel.

The four common predictors identified in the regression models for the purchase intention for all types of mass-customized apparel (i.e. attitude toward using apparel mass-customization, perceived usefulness of apparel mass-customization, fashion innovativeness, age) may be used as the bases for developing a marketing program, including various cohesive and integrated marketing strategies to sell mass-customized apparel. For example, marketers in mass-customized apparel may segment the market based on age and target more fashion innovative consumers among the younger consumers. In terms of product differentiation and positioning, a young male consumer who is innovative in fashion may desire his garments to be more fashionable. Establishing a chic image and offering more current style and fabric options through mass-customization than the competitors do may be a strategy to increase target customers' perceived usefulness of apparel mass-customization and to create a competitive advantage.

The results showed that the attitude toward using apparel mass-customization contributed the most in the regression models that identified the predictors of purchase intention for all four types of apparel mass-customization, suggesting that attitude toward using apparel mass-customization may have a stronger and closer relationship with the purchase intention for mass-customized apparel. If a customer does not recognize the usefulness of apparel mass-customization in the "knowledge" stage or favor using apparel mass-customization in the "like" or "prefer" stage as in Buyer Readiness Model (Kotler & Armstrong, 2010), it will be difficult for him/her to move toward the "conviction" stage. Conviction stage is where consumers choose the product of interest over the other alternatives, and form a purchase intention. Without the purchase intention, it is not likely that the consumer will perform the actual purchase behavior (Fishbein & Ajzen, 1975). Therefore, in addition to informing the usefulness of apparel mass-customization to help target customers recognize the need for mass-customization apparel,

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creating a favorable attitude toward using apparel mass-customization may be an important objective in creating an effective communication strategy.

Differences between Predictors of Overall Purchase Intention and Predictors of Purchase Intention for the Three Specific Types of Mass-customized Apparel

In identifying overall purchase intention for mass-customized apparel, sale proneness was found to be a predictor and it had a negative relationship with the purchase intention. However, sale proneness was not a predictor of the purchase intention for any specific types of mass-customized apparel. These results suggest that when the respondents considered their intention of purchasing mass-customized apparel in general, whether or not good bargains could be obtained from the product played an important role. According to these results, the marketers may consider targeting the consumers who are not sale prone. However, if the business goal is to attract customers who are sale prone, implementing sales promotion strategies may encourage them to try the mass-customization option without paying a certain premium. For example, coupons, temporary price reductions, a free upgrade from a ready-to-wear dress shirt to a mass-customized dress shirt, or a free trial for using mass-customization option for the price of a ready-to-wear dress shirt may be good strategies to attract first-time customers. After they experience the benefits of mass-customized apparel such as unique design, better fit, or a personalized design feature, they may perceive that the benefits (i.e. value that the product delivers to the customer) that they receive from purchasing mass-customized apparel exceed the cost (i.e. money) that they have to pay. When a consumer feels that the perceived cost is lower than the perceived value, then this situation leads to customer satisfaction, and further, customer loyalty (Kotler & Armstrong, 2010).

Time availability as a facilitating condition in using apparel mass-customization was a common predictor for the purchase intention for the three specific types of mass-customized apparel, although it was not a predictor of overall purchase intention for mass-customized apparel. These results suggest that when the respondents considered their purchase intention for a specific type of mass-customization, the concern of time needed to participate in a specific type of apparel mass-customization played a significant role. Therefore, when the marketer is promoting a specific type of mass-customized apparel, it is important to inform the customers about the approximate time to place an order for the specific type of mass-customized apparel.

Comparison of Predictors of Purchase Intention for the Three Specific Types of Mass-customized Apparel

The results showed that annual household income and annual clothing expenditure predicted the intention of purchasing design mass-customized apparel and personalization mass-customization apparel, but did not predict the purchase intention for fit mass-customized apparel. However, a negative relationship was found between annual household income and purchase intention while a positive relationship was found between annual clothing expenditure and purchase intention. In other words, the respondents who had lower annual household income and higher annual clothing expenditure expressed a higher level of purchase intention for design mass-customized apparel and for personalization mass-customized apparel. Further correlation analysis showed that age and annual household income were correlated. This meant that the younger respondents had lower income compared to the older respondents, and the younger respondents who earned less annual household income had higher purchase intention for design and personalization mass-customized apparel. These results suggest that promotion efforts of design mass-customization and personalization mass-customization may be more effective to younger consumers who spend more on clothing; however, a cautious approach is necessary because these target customers may not have a high household income. Therefore, to sell design mass-customized apparel to the above-mentioned consumer segment, efficient use of modules can be an example of reducing the production cost and thus lowering the retail price, by producing design mass-customized apparel with a relatively lower production cost at the manufacturing level. As another example, eliminating marketing intermediaries along the supply chain, such as a wholesaler, to cut the cost that occurs along the supply chain may also bring better value (i.e. lower price) to the customers. For personalization mass-customized apparel, setting a reasonable premium in terms of developing pricing strategy may be important for the younger customers who earn relatively lower income to feel that the premium is within their acceptable price range.

Unwillingness to pay premium was found to be a predictor for the purchase intention for design mass-customized apparel; however, it was not a predictor of the purchase intention for the other two types of mass-customized apparel. The respondents may have expected that design mass-customization may require a high premium for the garment construction because it allows customers to select fabric or major style options such as pocket, sleeve, and cuffs. The

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respondents who were willing to pay premium may have thought that it was worth paying a certain premium to purchase a product that they exactly wanted, and thus, they had a higher level of purchase intention. Therefore, willingness to pay premium played a much more important role in purchase intention for design mass-customized apparel.

Limitations and Recommendations

Few studies have examined the associations between consumer characteristics and behaviors in using apparel mass-customization. In the current study, male consumers' benefits sought and innovativeness were selected to be studied. In H1, the relationships between benefits sought (i.e., uniqueness seeking, fit seeking, deal seeking) and perceived usefulness were examined and in H2, the relationships between consumer innovativeness (i.e., fashion innovativeness, technology innovativeness) and self-efficacy were examined. The variance of perceived usefulness ($R^{2)}$) explained by the benefits sought in H1 and the variance of self-efficacy explained by consumer innovativeness in H2 ($R^{2)}$) were .23 and .21, respectively, indicating that only 23% of the variance in perceived usefulness was explained by the benefits sought (i.e., uniqueness seeking, fit seeking, unwillingness to pay premium) in H1 and that 21% of the variance in self-efficacy was explained by consumer innovativeness (i.e., fashion innovativeness, technology innovativeness). In order to identify more factors that predict perceived usefulness and self-efficacy, other types of benefit sought or consumer characteristics other than benefit sought may be included in future studies. For example, other types of benefit sought, such as convenience seeking or hedonic shopping experience seeking, or other consumer characteristics, such as time poverty or level of leadership at work, may be included to further understand which types of consumers favor using apparel mass-customization and have intention for purchasing mass-customized apparel.

The current study examined consumer behavior for the three types of apparel mass-customization proposed by Burns and Bryant (2005) (i.e., design mass-customized apparel, fit mass-customized apparel, personalized apparel). However, consumers' behavior related to other types of apparel mass-customization, such as clothes cloning suggested by Anderson-Connell et al. (2002), may differ from what was discussed in this study. In addition, the scope of apparel

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mass-customization in this study was limited to mid to high modularity (i.e., low to mid variety). The reason why this specific scope of apparel mass-customization was selected was to better reflect the current industry practice of mass-customization of apparel where many apparel manufacturers and retailers offer mass-customized apparel with mid to high modularity. However, certain consumers may have different opinions, attitude or purchase intention for mass-customized apparel, if the scope of apparel mass-customization covered a low level of modularity/high level of variety. For example, for the design mass-customization option with low modularity and high variety, consumers may have different levels of purchase intention than what was presented in the results of this study because the effort of participating in the co-design process is required more from the consumer in the product development of apparel mass-customization with low modularity (Duray, 2002). Therefore, future studies are needed to examine different scopes of apparel mass-customization, such as apparel mass-customization with low modularity and high variety.

In the current study, a survey research design was used because surveys were known to provide a quick, efficient, and accurate means of assessing information about a population of interest (Zikmund, 2003). Because a larger sample size is generally used, the external validity (i.e., generalizability) is usually better in a survey research design than in an experimental design, in which a large sample size is difficult to obtain because it is difficult to recruit a large size of participants who are willing to come to a particular experimental setting. However, in a survey design, extraneous variables may interfere in obtaining true answers from the respondents because it is difficult for the researcher to control the environment of data collection. Therefore, the internal validity (i.e., the ability to determine a cause-and-effect relationship) is low in a survey design. Experimental design allows the researchers to hold the research environment to be consistent among the experimental groups but to manipulate the treatment in each group, and therefore, the influences of extraneous variables can be minimized. In addition, random assignment in an experimental design can theoretically even out any pre-existing biases among the experimental groups. For example, the researcher can randomly assign the participants into experimental groups to make their characteristics in different groups roughly equivalent and to make any differences in characteristics among the groups are due to chance. In such design, any effect observed between treatment groups can be linked to the treatment effect and not be associated with a characteristic of the individuals in the group. However, experimental design

studies may draw artificial results due to rigorous control over variables. Therefore, both survey design and experimental design studies are needed to understand consumer behavior in apparel mass-customization and to verify the results of the current study.

Current study examined the consumer behaviors in apparel mass-customization among male adult U.S. residents of age 20 or older who had a job in either sales and office occupations or managerial, professional, and related occupations. The reason for setting such selection criteria was to recruit male consumers who wear dress shirts more frequently. However, female consumers may also purchase menswear for their male significant other, and their responses may differ from those of male consumers'. Therefore, using the subjects who have different consumer characteristics is suggested to conduct comparison studies.

The respondents of this study were recruited through a marketing research company that had its own website for its customers to conduct online surveys. A national sample was used, but the consumers who did not have the Internet access were not likely to participate in this online survey. Another possible source of sampling bias was the non-monetary incentives such as points towards purchasing gift cards or merchandises provided by the marketing research company to the respondents who completed the survey. It is possible that the consumers who like to receive the incentive were more likely to participate in the online survey than those who were not interested in earning such incentives. Consumers who are willing to participate in an online survey to receive an incentive may have different consumer characteristics and behaviors from those of the consumers who are not interested in participating in an online survey and receiving non-monetary rewards. Therefore, the results of the current study cannot be generalized. Future research with different recruiting methods is suggested. For example, a mail survey instead of an online survey may be used to recruit consumers to verify the findings of the current study.

In the current study, dress shirts for male adults was used as the product category because this product category represents one of the most popular product categories for implementing apparel mass-customization in the current fashion industry. For example, several apparel retailers such as Brooks Brothers, Lands End, www.Shirtsmyway.com, and www.Raresplendors.com, provide mass-customized dress shirts. However, different results may be found when other apparel product categories such as pants, dress, or swimwear are used to examine consumer behaviors in using apparel mass-customization. Therefore, further studies

may be needed to examine consumer behavior in mass-customization of other apparel categories.

In terms of measurements, there were no items measuring consumers' desire of seeking the right fit in apparel products, from the previous studies related to apparel fit. Therefore, the measurements for consumer-perceived fit seeking were developed by the researcher. However, the measurements of fit seeking in the current study did not achieve a desirable reliability. The Cronbach's alpha was .54, which was less than .60, the suggested criterion of an acceptable Cronbach's alpha by Malhotra (2009). A reliable instrument measuring consumers' perception of fit seeking is needed in future research.

Conclusions

The purposes of the study were (a) to investigate purchase intention for mass-customized apparel, (b) to examine the relationships among consumer, perceived usefulness, perceived behavioral, attitude toward using apparel mass-customization and purchase intention for mass-customized apparel, and (c) to identify predictors of purchase intention in general and purchase intention for specific types of mass-customized apparel. Limited theoretically-grounded research has studied consumer behavior in apparel mass-customization, especially in purchase intention for mass-customized apparel, and few studies have examined male consumer behaviors in the apparel sector including the field of apparel mass-customization. A conceptual framework, using the Theory of Planned Behavior (Ajzen, 1991) and the Technology Acceptance Model (Davis, 1986), was developed as the theoretical base of the study. To better understand male consumer behaviors, male adults who held either sales and office occupation or management, professional, and related occupation were selected as the subjects of this study.

There was a lack of studies examining the associations between consumer characteristics and behaviors in apparel mass-customization. By including demographic and pyschographic variables such as benefits sought (i.e. uniqueness seeking, fit seeking, deal seeking) and innovativeness (i.e., fashion innovativeness, technology innovativeness), the results of this study provide some insights about who may consider apparel mass-customization as useful, who may feel confident in using apparel mass-customization, who may have favorable attitude toward using apparel mass-customization, and who may have an intention to purchase mass-customized

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apparel. The results suggest that consumers who seek more uniqueness and better fit in apparel, and who are willing to pay a premium for the products that they desire may consider apparel mass-customization as being more useful, compared to the other consumers without these characteristics. The consumers who are innovative in fashion and in technology seem to be more confident in using apparel mass-customization. Younger consumers who are innovative in fashion but not sale prone, and perceive apparel mass-customization as being useful and favor using apparel mass-customization would have a higher purchase intention for mass-customized apparel in general. The results of this study suggest that the consumers who perceive apparel mass-customization useful, feel confident in using apparel mass-customization, and consider having time to participate in apparel mass-customization process favor using apparel mass-customization. No study was found has examined the relationship between facilitating conditions (i.e. money availability, time availability), as one of the variables in perceived behavioral control, and attitude toward using apparel mass-customization. In the current study, time availability in facilitating conditions was found not only to be a predictor for attitude toward using apparel mass-customization, but also a predictor of purchase intention for each of the three types of mass-customized apparel (i.e., design mass-customized apparel, fit mass-customized apparel, personalization mass-customized apparel).

No study was found has examined consumer behavior in different types of apparel mass-customization. Consumers may have different wants and needs from mass-customized apparel of different types, and therefore, consumers with different characteristics may prefer one type of apparel mass-customization over another. In this study, the purchase intentions for the three types of mass-customized apparel (i.e. design mass-customized apparel, fit mass-customized apparel, personalization mass-customized apparel) were examined along with the overall purchase intention for mass-customized apparel. Four common predictors of all four types of purchase intentions for mass-customized apparel were identified (i.e., attitude toward using apparel mass-customization, perceived usefulness of apparel mass-customization, fashion innovativeness, age). However, differences were also found between the predictors of overall purchase intention and the predictors of the three specific types of mass-customized apparel. Time availability was a predictor of all three specific types of mass-customized apparel, while it was not a predictor of overall purchase intention. Annual household income and annual clothing expenditure were predictors of design and personalization mass-customized apparel but were not

predictors of fit mass-customized apparel. As a predictor unique to the purchase intention for design mass-customized apparel, unwillingness to pay extra was found to have a negative relationship with the purchase intention.

In conclusion, this study filled some of the gaps in literature and examined male consumer behavior in the domain of apparel mass-customization, which expands the scope of research related to apparel consumer behavior. The applications of the findings were addressed. Based on the results of the relationships between among consumer characteristics, perceived usefulness, perceived behavioral control, attitude toward using apparel mass-customization and purchase intention for mass-customized apparel, suggestions were provided to illustrate how the findings may provide bases for developing market segmentation strategies to better target consumers who have higher purchase intention for mass-customized apparel, to develop product strategies to offer mass-customized apparel products that can satisfy consumers' wants and needs, and to develop promoting strategies to effectively communicate with the consumers so that the marketer may attract new customers and retain existing customers. By understanding the varying purchase intentions for different types of mass-customized apparel, apparel marketers may develop research-based marketing strategies to better cater to their customers and to maximize their profit by offering the type of mass-customized apparel that is most desired by the targeted customers.

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APPENDICES

Appendix A.

Final Questionnaire

Appendix B.

Approved IRB

Appendix C.

Factor Analyses Results of One-factor Variables

Appendix A

Questionnaire

QUESTIONNAIRE

Survey on male consumers' apparel shopping behavior

1. What is your gender?
   -Male
   -Female

2. My age is:
   - Younger than 20
   - 20-24
   - 25-29
   - 30-34
   - 35-39
   - 40-44
   - 45-49
   - 50-54
   - 55-59
   - 60-64
   - 65-69
   - 70-74
   - 75-79
   - 80-84
   - 85 or older

3. My occupation is in the category of:
   - Management, professional, and related occupations (e.g. management, business and financial operations, computer, architecture, engineering, life/physical science, community/social science, legal, education, training, library, entertainment, media, healthcare practitioner/technician)
   - Service occupations (e.g. healthcare support, protective service, food preparation and serving, building and grounds cleaning and maintenance, personal care and service)
   - Sales and office occupations (e.g. sales, office and administrative support)
   - Farming, fishing, and forestry occupations
   - Construction, extraction, maintenance, and repair occupations (e.g. carpenters, stonemasons, construction laborers)
   - Production, transportation, and material moving occupations (e.g. bakers, truck drivers, bus drivers)

Please select one answer that best describes your attitudes toward clothing and your motives for clothing shopping. Several questions will be used to measure one concept to increase the reliability of the scale.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

4. I look for unique clothing to create my own style.
5. I dislike clothing designs bought by everyone.

6. The clothing designs that I like best are the ones that express my individuality.

7. When buying clothing, an important goal is to find a design that communicates my uniqueness.

8. When a clothing design becomes too popular, I buy it less.

9. I buy clothing that can create a more distinctive personal image.

10. I do not buy the clothing when I see similar clothing is worn by almost everyone.

11. The clothing that I buy shapes my unique identity.

12. Please provide some reasons why you answered the way you did from Questions 4 to 11.Thank you.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

13. When shopping for clothing, I always try on clothes to make sure that I find the best fit.

14. When I purchase clothing, fit, and not any other aspects such as design, material, workmanship or price, is the most important criterion.

15. Wearing clothes that fit my body perfectly is extremely crucial to me.

16. It is difficult to find clothing that fits my body well.

17. Please provide some reasons why you answered the way you did from Questions 13 to 16.Thank you.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

18. There is absolutely no relationship between the price of clothing and the satisfaction that I get from the product.

19. Compared to most people, I buy clothing that is on sale more frequently.

20. When purchasing clothing, I pay more for the best.

21. I almost always buy only the clothing that is on sale.

22. The price of clothing is a good indicator of its quality.

23. I am willing to pay extra for clothing that I desire.
24. Please provide some reasons why you answered the way you did from Questions 18 to 23.Thank you.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

25. I tend to know more about the current fashion trends, compared to my circle of friends.

26. I wear the clothing that is compatible with the current fashion.

27. I tend to buy new arrivals of clothing.

28. I enjoy knowing fashion trends.

29. Compared to my friends, I own more fashionable clothing.

30. When buying clothing, I consider myself to be fashion-conscious.

31. When I hear about new technology, I look for ways to learn more about it.

32. I am among the first to try new technologies.

33. I like to experiment with new technologies.

34. I like to experiment with the interactive communication technology through the Web (e.g. real-time online communication with a manufacturer or a retailer).

35. I like to experiment with the Internet technology that visualizes a company's product designs and options.

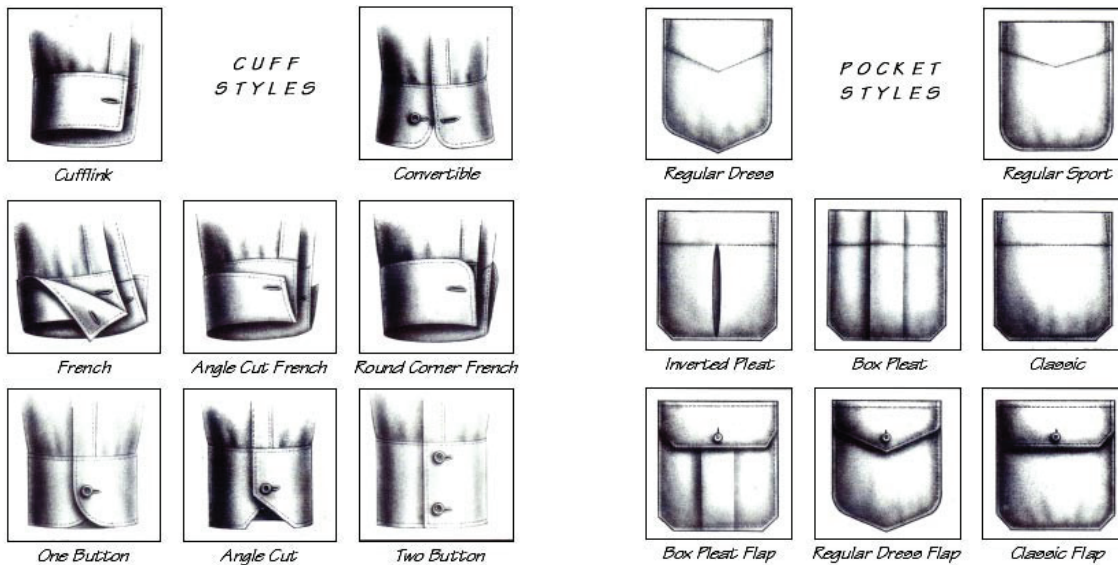**Please carefully read the following descriptions about apparel mass-customization. All questions in the next part of the survey are related to apparel mass-customization. Thank you.**

Apparel mass-customization is the production of individually customized apparel products with a standardized mass-production system so that consumers can buy a customized product at a price similar to the prices of mass-produced apparel.

a. **Design Mass-customization** is a type of apparel mass-customization, which allows consumers to select design (e.g. style, fabric, or color) preferences from the selection provided.

For example, for a dress shirt, you can choose your own style from various types of collar, sleeves, pocket, and pleating, and can choose fabric and color of your preference. The following pictures provide an example of various types of collars, cuffs, and pockets for customers to select when buying a mass-customized dress shirt.

Examples of **Design** mass-customization:
(Pictures: Copyright © by www.raresplendors.com)

Narrow Spread Snap Tab	Narrow Spread	Modified Spread 2-1/2" Points	Modified Spread 3" Points
Medium Spread	Medium Spread Button Down	Wide Spread 2-1/2" Points	Wide Spread 3" Points

CUFF STYLES

Cufflink	Convertible
French	Angle Cut French / Round Corner French
One Button	Angle Cut / Two Button

POCKET STYLES

Regular Dress	Regular Sport
Inverted Pleat / Box Pleat / Classic	
Box Pleat Flap / Regular Dress Flap / Classic Flap	

b. Fit Mass-customization is a type of apparel mass-customization, which allows consumers to provide one to a few of their body measurements for the manufacturer to produce a garment that specifically fits the consumer's body.

For example, you may measure your neck circumference, sleeve length, and upper body length according to the instructions stated by the apparel company. Then, provide the body measurements to the manufacturer so that it can make a dress shirt just for you. You may also indicate your fit preference such as tailored fit or loose fit.

Example of **Fit** mass-customization:

The manufacturer may ask you to provide your measurements and indicate your reference as below.
    Neck circumference:
    Sleeve length:
    Upper body length:
    Your preference of tailored fir or loose fit:

c. Personalization Mass-customization is a type of apparel mass-customization, which allows consumers to add personalized details such as monogram, personal embroidery, laser stitching, or fabric ornamentation to the purchased item.
For example, you can have your initials monogrammed on the pocket or on the cuff of the dress shirt.

Example of **Personalization** mass-customization:
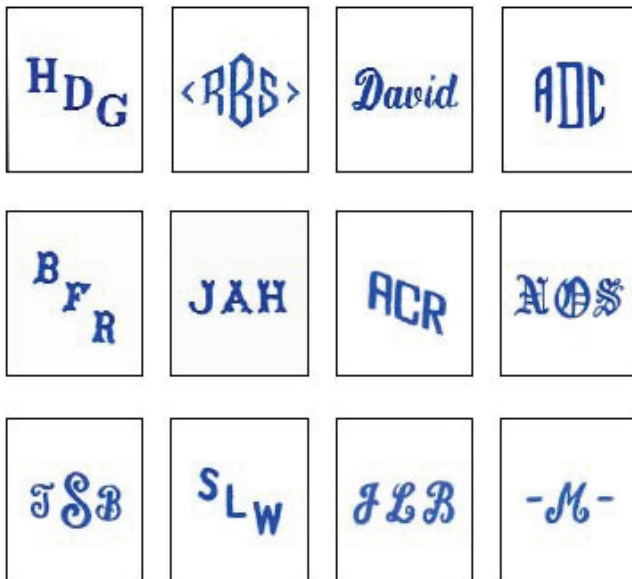
Pictures: Copyright (c) by www.raresplendors.com

In the following questions, we would like to know your perceptions toward using apparel mass-customization to purchase dress shirts based on what you know now, even though you may not have used apparel mass-customization to purchase dress shirts before.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

36. Apparel mass-customization is extremely useful to me when buying dress shirts that I want.

37. Apparel mass-customization can save me time in getting dress shirts that I want.

38 Using apparel mass-customization is the most effective way to buy dress shirts.

39. Design mass-customization is the best way to buy dress shirts that have the design that I specifically want.

40. Fit mass-customization is the best way to buy dress shirts that fit my body.

41.Personalization mass-customization (e.g. monogramming initials on a pocket or on a cuff) is the best way to buy dress shirts with a personal touch.

42. Please provide some reasons why you answered the way you did from Questions 36 to 41.Thank you.

In the following questions, we would like to know your perceptions on using apparel mass-customization to purchase dress shirts based on what you know now, even though you may not have used apparel mass-customization to purchase dress shirts before.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

43. If I wanted to use apparel mass-customization to buy a dress shirt, I am very sure that it would be extremely easy.

44. I know enough to use apparel mass-customization to buy a dress shirt.

45. I feel very confident that using apparel mass-customization would not be difficult at all when buying a dress shirt.

46. I would feel confident in providing information to the manufacturer when using design mass-customization to buy a dress shirt.

47. I would be confident in following instructions to take my body measurements when using fit mass-customization to buy a dress shirt.

48. I would feel confident in making a decision when using personalization mass-customization to buy a dress shirt.

49. Please provide some reasons why you answered the way you did from Questions 43 to 48. Thank you.

In the following questions, we would like to know your perceptions on using apparel mass-customization to purchase dress shirts based on what you know now, even though you may not have used apparel mass-customization to purchase dress shirts before.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

50. I have time to use apparel mass-customization to buy a dress shirt.
51. I have time to use design mass-customization to buy a dress shirt.

52. I have time to use fit mass-customization to buy a dress shirt.

53. I have time to use personalization mass-customization to buy a dress shirt.

In the following questions, we would like to know your perceptions on using apparel mass-customization to purchase dress shirts based on what you know now, even though you may not have used apparel mass-customization to purchase dress shirts before.
1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

54. It is a very good idea to use mass-customization when shopping for dress shirts.

55. I will find it very rewarding to use mass-customization when shopping for dress shirts.

56. I would find using mass-customization a very enjoyable way to shop for dress shirts.

57. Using mass-customization to shop for dress shirts is very beneficial.

58. It is a very good idea to use design mass-customization when shopping for dress shirts.

59. It is a very good idea to use fit mass-customization when shopping for dress shirts.

60. It is a very good idea to use personalization option in shopping for dress shirts.

61. Please provide some reasons why you answered the way you did from Questions 54 to 60.Thank you.

Please select one answer that best describes your intention of purchasing mass-customized dress shirts.

1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree

62. It is likely that I will purchase mass-customized dress shirts.

63. It is likely that I will purchase a mass-customized dress shirt next time I need a dress shirt.

64. The probability of me buying mass-customized dress shirts in the future is high.

65. It is likely that I will purchase design mass-customized dress shirts.

66. It is likely that I will purchase fit mass-customized dress shirts.

67. It is likely that I will purchase personalized mass-customized dress shirts.

68. Please provide some reasons why you answered the way you did from Questions 62 to 67.Thank you.

69. How much do you normally pay for a ready-to-wear dress shirt, in a dollar ($) amount?

70. Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you just wrote down for Q#69, how much are you willing to pay for a design mass-customized dress shirt, in a ($) amount?

71. I have money to pay the premium of design mass-customized dress shirts.
    (1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree)

72. How long are you willing to wait between the time of placing the order of a design mass-customized dress shirt and receiving the product? If you absolutely will not purchase a mass-customized dress shirt, please write "N/A".

73. Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you wrote down for Q#69, how much are you willing to pay for a fit mass-customized dress shirt, in a ($) amount?

74. I have money to pay the premium of fit mass-customized dress shirts.
    (1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree)

75. How long are you willing to wait between the time of placing the order of a fit mass-customized dress shirt and receiving the product? If you absolutely will not purchase a mass-customized dress shirt, please write "N/A".

76. Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you wrote down for Q#69, how much are you willing to pay for a personalization mass-customized dress shirt, in a ($) amount?

77. I have money to pay the premium of personalized (e.g. monogrammed) dress shirts.
   (1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree)

78. How long are you willing to wait between the time of placing the order of a personalized dress shirt and receiving the product? If you absolutely will not purchase a mass-customized dress shirt, please write "N/A".

79. Compared to the ($) amount you normally pay for a ready-to-wear dress shirt that you wrote down for Q#69, how much are you willing to pay for a mass-customized dress shirt in general, in a ($) amount?

80. I have money to pay the premium of mass-customized dress shirts in general.
   (1= Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree)

81. How long are you willing to wait between the time of placing the order of a mass-customized dress shirt in general and receiving the product? If you absolutely will not purchase a mass-customized dress shirt, please write "N/A".

82. Please provide some reasons why you answered the way you did from Questions 69 to 81.Thank you.

Please select one answer that best describes your experience in purchasing ready-to-wear dress shirt(s) and in purchasing mass-customized dress shirt(s).
83. How often do (did) you purchase dress shirts?
   - Never
   - Less than once a year
   - About once a year
   - About every 6 months
   - About every 3 months
   - Once a month or more often

84. How many dress shirts have you purchased in the last 12 months?
   - None
   - 1-2 items
   - 3-4 items
   - 5-6 items
   - 7-8 items
   - 9 or more items

85. How often do you wear a dress shirts?
   - Almost never
   - Less than once a month
   - About once or twice a month
   - About once a week
   - About three times a week
   - Almost every day

86. How often do (did) you purchase mass-customized apparel products? It can be any kind of mass-customized clothing.
   - Never
   - Less than once a year
   - About once a year
   - About every 6 months
   - About every 3 months
   - Once a month or more often

87. How often do (did) you purchase <u>design</u> mass-customized apparel products? It can be any kind of design mass-customized apparel.   (Options were same as Q86)

88. How often do (did) you purchase <u>fit</u> mass-customized apparel products? It can be any kind of fit mass-customized apparel.   (Options were same as Q86)

89. How often do (did) you purchase <u>personalization</u> mass-customized apparel products? It can be any kind of personalization mass-customized apparel.   (Options were same as Q86)

90. How many mass-customized apparel products have you purchased in the last 12 months?
   - None
   - 1-2 items
   - 3-4 items
   - 5-6 items
   - 7-8 items
   - 9 or more items

91. How much in total have you spent on previous purchases of mass-customized apparel in the last 12 months?
   - None
   - $1-$100
   - $101-$200
   - $201-300
   - $301-$400
   - $400 or more

(0=No experience, 1=strongly disagree/ 4=strongly agree)

92. I have enjoyed purchasing mass-customized apparel.

93. Purchasing mass-customized apparel products has been a good experience.

94. I am satisfied with my experiences with buying mass-customized apparel products.

95. Please provide some reasons why you answered the way you did from questions 83 to 94.

Please select one answer that best reflects you.

96. My highest level of education is:
- Less than 9th grade
- 9th to 12th grade, no diploma
- High school graduate
- Some college but no diploma
- Associate's degree, occupational
- Associate's degree, academic
- Bachelor's degree
- Graduate or professional degree

97. My race is:
-American Indian or Alaska Native
-Asian
-Black or African American
-Native Hawaiian or Other Pacific Islander
-White or Caucasian
-Hispanic or Latino/ Latina
-Other: Please specify.

98. My last year household income is approximately:
-Less than $10,000
-$10,000-$14,999
-$15,000-$24,999
-$25,000-$34,999
-$35,000-$49,999
-$50,000-$74,999
-$75,000-$99,999
-$100,000-$149,999
-$150,000-$199,000
-$200,000 or more

99. My yearly expenditure for purchasing apparel is approximately:
    -None
    -$1-$99
    -$100-$199
    -$200-$299
    -$300-$399
    -$400-$499
    -$500-$599
    -$600-$699
    -$700-$799
    -$800-$899
    -$900-$999
    -$1,000-$1,999
    -$2000-$2,999
    -$3,000-$3,999
    -$4,000-$4,999
    -$5,000 or more

Thank you very much for completing the survey!!!

Appendix B

Approved IRB

Office of Research Compliance
Institutional Review Board
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, Virginia 24060
540/231-4606 Fax 540/231-0959
e-mail irb@vt.edu
Website: www.irb.vt.edu

VirginiaTech

MEMORANDUM

DATE: January 13, 2011

TO: Hsiu I Chen-Yu, Jung ha Yang

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires October 26, 2013)

PROTOCOL TITLE: The Relationship Between Consumer Characteristics, and Attitude and Purchase Intention in Apparel Mass-Customization

IRB NUMBER: 11-020

Effective January 13, 2011, the Virginia Tech IRB PAM, Andrea Nash, approved the new protocol for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at http://www.irb.vt.edu/pages/responsibilities.htm (please review before the commencement of your research).

PROTOCOL INFORMATION:
Approved as: **Exempt, under 45 CFR 46.101(b) category(ies) 2**
Protocol Approval Date: **1/13/2011**
Protocol Expiration Date: **NA**
Continuing Review Due Date*: **NA**
*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:
Per federally regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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An equal opportunity, affirmative action institution

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

cc: File

Appendix C

Factor Analyses Results of One-factor Variables

C.1. Uniqueness Seeking
C.2. Fit Seeking
C.3. Fashion Innovativeness
C.4. Technology Innovativeness
C.5. Perceived Usefulness
C.6. Self-efficacy
C.7. Attitude toward Using Apparel Mass-customization
C.8. Purchase Intention for Mass-customized Apparel

Appendix C.1 Results of Factor Analysis: Uniqueness Seeking

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
I look for unique clothing to create my own style.	.818	4.91	61.40	0.94
I dislike clothing designs bought by everyone.	.582			
The clothing designs that I like best are the ones that express my individuality.	.842			
When I buy clothing, an important goal is to find a design that communicates my uniqueness.	.857			
When a clothing design becomes too popular, I buy it less.	.719			
I buy clothing that can create a more distinctive personal image.	.840			
I do not buy clothing when I see similar clothing is worn by almost everyone.	.725			
The clothing that I buy shapes my unique identity.	.845			

Appendix C.2 Results of Factor Analysis: Fit Seeking

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
When shopping for clothing, I always try on clothes to make sure that I find the best fit.	.669	1.70	42.51	.54
When I purchase clothing, fit, and not any other aspects such as design, material, workmanship or price, is the most important criterion.	.623			
Wearing clothes that fit my body perfectly is extremely crucial to me.	.741			
It is difficult to find clothing that fits my body well.	.563			

Appendix C.3 Results of Factor Analysis: Fashion Innovativeness

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
I tend to know more about the current fashion trends, compared to my circle of friends.	.878	4.58	76.37	.94
I wear the clothing that is compatible with the current fashion.	.801			
I tend to buy new arrivals of clothing.	.861			
I enjoy knowing fashion trends.	.894			
Compared to my friends, I own more fashionable clothing.	.896			
When buying clothing, I consider myself to be fashion-conscious.	.909			

Appendix C.4 Results of Factor Analysis: Technology Innovativeness

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
When I hear about new technology, I look for ways to learn more about it.	.803	3.56	71.23	.90
I am among the first to try new technologies.	.848			
I like to experiment with new technologies.	.866			
I like to experiment with the interactive communication technology through the Web (e.g. real-time online communication with a manufacturer or a retailer).	.856			
I like to experiment with the Internet technology that visualizes a company's product designs and options.	.845			

Appendix C.5 Results of Factor Analysis: Perceived Usefulness

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
Apparel mass-customization is extremely useful to me when buying dress shirts that I want.	.871	4.04	67.34	.90
Apparel mass-customization can save me time in getting dress shirts that I want.	.873			
Using apparel mass-customization is the most effective way to buy dress shirts.	.856			
Design mass-customization is the best way to buy dress shirts that have the design that I specifically want.	.856			
Fit mass-customization is the best way to buy dress shirts that fit my body.	.773			
Personalization mass-customization (e.g. monogramming initials on a pocket or on a cuff) is the best way to buy dress shirts with a personal touch.	.674			

Appendix C.6 Results of Factor Analysis: Self-efficacy

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
If I wanted to use apparel mass-customization to buy a dress shirt, I am very sure that it would be extremely easy.	.801	3.90	64.94	.89
I know enough to use apparel mass-customization to buy a dress shirt.	.798			
I feel very confident that using apparel mass-customization would not be difficult at all when buying a dress shirt.	.845			
I would feel confident in providing information to the manufacturer when using design mass-customization to buy a dress shirt.	.824			
I would be confident in following instructions to take my body measurements when using fit mass-customization to buy a dress shirt.	.799			
I would feel confident in making a decision when using personalization mass-customization to buy a dress shirt.	.767			

Appendix C.7 Results of Factor Analysis: Attitude toward Using Apparel Mass-customization

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
It is a very good idea to use mass-customization when shopping for dress shirts.	.901	5.24	74.86	.94
I will find it very rewarding to use mass-customization when shopping for dress shirts.	.889			
I would find using mass-customization a very enjoyable way to shop for dress shirts.	.885			
Using mass-customization to shop for dress shirts is very beneficial.	.909			
It is a very good idea to use design mass-customization when shopping for dress shirts.	.882			
It is a very good idea to use fit mass-customization when shopping for dress shirts.	.817			
It is a very good idea to use personalization option in shopping for dress shirts.	.764			

Appendix C.8 Results of Factor Analysis: Purchase Intention for Mass-customized Apparel

Factor	Factor Loading	Eigen-value	% in Variance	Cronbach's alpha
It is likely that I will purchase mass-customized dress shirts.	.921	4.70	78.32	.91
It is likely that I will purchase a mass-customized dress shirt next time I need a dress shirt.	.907			
The probability of me buying mass-customized dress shirts in the future is high.	.923			
It is likely that I will purchase design mass-customized dress shirts.	.896			
It is likely that I will purchase fit mass-customized dress shirts.	.874			
It is likely that I will purchase personalized mass-customized dress shirts.	.782			