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Attitudes Toward Consumer-Customized High-Tech Products: The Role of Perceived Usefulness, Perceived Ease of Use, Technology Readiness, and Customer Customization Sensitivity

Margarita B. Guilabert
mktmbgx@langate.gsu.edu

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**Attitudes Toward Consumer-Customized
High-Tech Products: The Role of Perceived Usefulness,
Perceived Ease of Use, Technology Readiness, and
Customer Customization Sensitivity**

Margarita B. Guilabert

A Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

in the

J. Mack Robinson College of Business

Georgia State University

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ABSTRACT

ATTITUDES TOWARD CONSUMER-CUSTOMIZED HIGH-TECH PRODUCTS: THE ROLE OF PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, TECHNOLOGY READINESS AND CUSTOMER CUSTOMIZATION SENSITIVITY

By

Margarita B. Guilabert

August 23, 2004

Committee Chair: Dr. Naveen Donthu

Major Department: Marketing

Theoretical research on mass customization of consumer products/services has emphasized the importance of consumers embracing customized products as a prerequisite for this strategy to be successful. It seems obvious that if final consumers are not interested in customization there is no need to pursue customization strategies. Although an important body of literature on mass customization has recently emerged, there is a need to know more about customization from the consumer's point of view. In that sense, this research examines consumers' attitudes toward customized products/services in the context of high technology.

Focusing on high-tech products that can be customized by consumers, this study proposed an empirical model combining the Technology Acceptance Model (Davis, 1986) with other critical variables (technology readiness, perceived customization, and customer customization sensitivity) that would help to understand consumers' attitudes toward these types of products.

To evaluate the model an experiment-based research design with a single-factor between subjects study was utilized. Based on the context of high-technology products, several scenarios of cellular phones were developed and tested. Participants were then asked about their perceptions of the cellular phones as well as measures of technology readiness, attitudes toward using the product, and intention to use the product.

Utilizing linear regression, the hypothesized model was largely validated. As expected, the more positive the attitude toward using the product, the greater the intention to use the product. The study also showed that consumers need to believe that the product would be easy to use and useful in order for them to develop an interest in using it. In addition, results indicated that a product's customization capabilities seem to have an impact on the perception of how easy to use that product is. At the same time, if a product is perceived as being very customizable it would also be perceived as very useful. Results did not support the hypothesized relationship of customer customization sensitivity and perceived usefulness and perceived customization and new alternative relationships were explored in the study. Finally, the analysis also confirmed the role of technology readiness as a moderator between perceived ease of use and perceived customization.

CHAPTER I

INTRODUCTION

Since the term *mass customization* first appeared in Davis's (1987) book *Future Perfect*, an important research stream on customization and personalization has emerged (see Ansari & Mela, 2003; Kasanoff, 2001; Kotler, 1989; Logman, 1997; Pine, 1991, 1993). Literature on mass customization is extensive, especially in the areas of production and management. Traditionally, these studies have taken a made-to-order approach where the seller or producer had to implement the customization (Ahlstrom & Westbrook, 1999; Duray & Milligan, 1999; Duray, Ward, Milligan, & William, 2000; Kotha, 1995; Feitzinger & Lee, 1997; Radder & Louw, 1999; Peters & Saidin, 2000). With such products the process of customization does not affect how consumers use or perceive the product itself because they receive just the final offering and have no input on the makeup of the product bundle. In this type of mass customization process, consumers are given a wide range of options to choose from for the final production of a particular model or product. Communications with the producer as well as flexibility become key elements for the success of these types of strategies (Reichwald, Piller, & Moslein, 2000).

More recently, with the advent of new technologies, an approach to mass customization has been made possible in which the manufacturer does not need to be the one producing the final item. Thanks to new technology processes the manufacturer produces an item that allows the final user to configure or customize it to her taste and needs. This new approach, named a *prosumer* approach in mass customization literature (Lee, Barua, & Whinston, 2000) and personalization in connection with Web systems

(Volkov, 1999), requires the consumer to perform the necessary tasks to produce the final customized product.

In general, most of the literature on mass customization appears to indicate that a mass-customization strategy is desirable and can be very effective, especially when managers and marketers understand the differences between their traditional standardization practices and the new mass-customized ones. However, there also seems to be consensus among scholars about the lack of knowledge pertaining to the relation between mass customization as a strategy and marketing theory in general and consumer behavior in particular (Ahlstrom & Westbrook, 1999; Da Silveira, Borenstein, & Flogiatto, 2001; Duray, et al., 2000; Hart, 1995; Jiang, 2000; Lee, Barua, & Whinston, 2000; Reichwald, Piller, & Möslein, 2000; Wind, 2001). To date, very little scientific work examines consumer behavior and attitudes toward customized products and due to the novelty of the topic, little research has focused on the prosumer approach mentioned earlier.

For mass customization to be successful, consumers first must desire customized products or services (Radder & Louw, 1999). Svensson and Jensen (2001) state that there is no value in customizing most consumer goods because, for these products, variation is of little value to the consumer. Clearly, a deeper understanding of customization from the consumer's point of view is needed. In particular, there is a need to know more about the attitudes of consumers toward customized products. Ultimately, it is necessary to know which consumers want more customization in which products and why.

This study focuses on studying the prosumer approach to mass customization from the consumer perspective. In order to investigate attitudes toward customized

products from the prosumer approach, a specific context had to be selected. The goal was to identify a product category that consumers would be relatively familiar with and one that has multiple levels or features that can be customized by those consumers. One particular category that fits these criteria well is high-technology products. To incorporate the prosumer approach as well as the context of high technology, this research will refer to *consumer-customized high-tech products* (CCHT products). A better explanation of this definition is in order. When mentioning “products,” it refers to a comprehensive package of the physical product plus the services it offers with no distinction between the two because both offer bundles of tangible and intangible attributes (John, Weiss, & Dutta, 1999). Product, therefore, refers to both physical products and services. By adding the adjective “high-tech” to products it emphasizes that these are products whose production involves advanced or specialized systems or devices and are based on significant amounts of scientific and technical know-how (John et al., 1999). Finally, the words *consumer-customized* acknowledge the prosumer approach to mass customization—i.e., those products that can be customized by the ultimate consumer.

An example of a CCHT product is a cell phone that allows the user to configure it to his/her tastes and needs (the configuration could be from the outside cover to the number directory options as well as choice of screen colors, volume controls, ring-tones, and so on). Another example that is experiencing growth is the personal or digital video recorder that lets the user select, organize, and control the interface and the information and television programs saved for future viewing.

In the present research well-established theories from the information systems and marketing fields will be utilized to explore consumer behavior and attitudes toward mass

customization. In particular, this study will expand the study of motivational variables that mediate between product characteristics and the intention by consumers to use CCHT products. In the Management Information Systems (MIS) literature an important objective has been to understand the factors that influence successful development and implementation of computer-based systems in organizations (Davis, 1986). This research parallels the goal of understanding the critical factors that influence successful development, implementation, and marketing of CCHT products, although in the consumer context. Because in MIS studies as well as in this study the final object (computer-based systems and CCHT products) refers to technology, this study will use some of the well-known variables that have been widely studied in the Information Systems field. These variables relate to the role of perceived usefulness and the perceived ease of use of a system (Davis, 1986), or in this case the perceived usefulness and ease of use of CCHT products.

While many studies in the marketing literature have studied customer reactions to technology (Bitner, Brown, & Meuter, 2000; Cowless & Crosby, 1990; Meuter, Ostrom, Roundtree, & Bitner, 2000; Mick & Fournier, 1998), scholarly research on people's readiness to use technology-based systems is sparse (Parasuraman, 2000). The proliferation of technology-based products and services encourages scholars to study how people embrace and use new technologies (Parasuraman, 2000). The current research aims to fill this need by utilizing the construct of technology readiness (Parasuraman, 2000) to help understand consumers' attitudes toward using CCHT products.

Finally, the recently introduced construct of customer customization sensitivity (Hart, 1995) in the mass-customization literature will be investigated in this study. The

consumer's sensitivity toward customization (or perceived need for customization) will play an important role in shaping consumer attitudes toward CCHT products. In particular, this study investigates the impact of customization sensitivity on the motivational variables that affect attitudes toward using CCHT.

In summary, the objective is to examine the nature of consumer attitudes toward CCHT products. This will be accomplished by developing a conceptual model with established constructs from the marketing, consumer behavior, and information systems literature as well as concepts based on the literature but developed and tested in the present research.

Purpose of the Study

Based on previous research from consumer behavior and information systems literature, this study will develop a conceptual model that examines the role of perceived customization, perceived ease of use, and perceived usefulness on consumer attitudes toward CCHT products and the intention to use such products. The specific objectives of the research are to:

- Develop and test a conceptual model to help explain consumer attitudes toward using CCHT products. The originality of this research lies in the incorporation of widely researched attitude theory in a new category of products in the context of high technology. Since the importance of high-tech products has gained momentum in previous decades, it seems necessary to increase knowledge of consumer behavior in this area.

- Examine how perceived customization/customizability of CCHT products will impact the perceived usefulness and ease of use of those products. Given the nature of the chosen products for research, well-known constructs from the literature such as perceived usefulness and ease of use will be investigated. It is expected that the perception of how customizable the products are in the mind of the potential users, will have an important impact on the perceived usefulness and ease of use of those products.
- Investigate if consumers differ in their intentions to use CCHT products based on how easy to use and useful they perceive these products to be. It is important to know if the behavior toward CCHT products is similar or different from the consumer behavior toward traditional products. This study intends to examine the impact of usefulness and ease of use of CCHT products on the attitudes toward using and intention to use those products.
- Analyze the impact of people's readiness to use technology as well as the impact of people's sensitivity toward customizability on their attitudes toward using CCHT products.

Overview of the Dissertation

The present document is organized in five chapters. The first chapter presents the topic of mass-customization and sets the context of the study. It introduces the concepts that will be utilized to develop the conceptual model that will be empirically tested with this study.

The second chapter reviews the relevant literature on the concepts of interest to develop the model: mass customization, high-technology marketing, attitudes, perception, and technology readiness and customization sensitivity. The chapter also presents the hypotheses and the proposed conceptual model to explain consumer attitudes toward using CCHT products.

Chapter three describes the research design as well as the methodology that has been used in the study. The operational definitions, measures of the constructs of the model, sampling framework, and method of analysis are described.

In chapter four, a discussion on the data collection and procedures that were followed is introduced. A description of the sample characteristics is also presented and the data analysis for testing the hypothesized model is described in detail.

Chapter five includes the theoretical and managerial contributions of the study, with the implications for scholars and for managers who are considering mass-customization strategies, as well as several limitations of the study. Directions for further research are also included in chapter five.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESES

This chapter reviews the literature relating to the topics of interest as the foundation for the development of a conceptual model and hypotheses that will help understand consumer attitudes toward using CCHT products. The first section focuses on literature on mass customization and high-technology marketing to explain the context of the study. Next, the literature on attitudes and technology is reviewed as the basis for the development of the conceptual model and hypotheses. Following, literature relating to perception is also reviewed. Finally, existing literature on technology readiness and customization sensitivity is introduced.

Mass Customization

Beginning in the trade and popular business press, research on mass customization developed in the management and manufacturing literatures. Drucker (1954) mentioned the importance of the customer in 1954 when he stated that a business is determined by its customers. In one of his futuristic outlooks, Toffler (1980) refers to terms such as “concentration,” “specialization,” or “standardization.” However, the specific mention and creation of the term “mass customization” is credited to Stanley M. Davis (1987). In his book *Future Perfect*, Davis devotes a whole chapter to *mass customizing*, a concept that created the basis for what is understood today as mass customization. In a more concrete manner, not unlike previous discussions, Davis (1987) argues:

The world of mass customizing is a world of paradox with very practical implications. Whether we are dealing with a product, a service, a market or an organization, each is understood to be both part (customized) and whole (mass) simultaneously. New technologies are now coming on-stream which deal with infinitesimal parts of the wholes that interest us. They are able to get specific about parts that earlier technologies had to leave undifferentiated. In addition, they operate at such fast speeds that we may consider their treatment of parts simultaneous. Speed and specificity are the hallmarks of these new technologies and the foundation for the mass customizing of products and services that follow. . . . For mass customizing of products, markets and organizations to be possible, the technology must make it economically feasible in every case. (p. 140)

The next milestone in mass-customization literature is credited to Pine. In 1991, Joe B. Pine wrote a masters thesis called “Paradigm Shift: From Mass Production to Mass Customization.” In this thesis, he lays the foundation for the later mass-customization literature. Two years later, in 1993, Pine published a seminal book titled *Mass Customization*. In that book, Pine establishes a comparison of mass production and mass customization (see Table 1) and states the goals of mass customization:

. . . practitioners of mass-customization share the goal of developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want. (p. 44)

Table 1.
Comparison of Mass Production and Mass Customization

	Mass Production	Mass Customization
Focus	Efficiency through stability and control	Variety and customization through flexibility and quick responsiveness
Goal	Developing, producing, marketing and delivering goods and services at prices low enough that nearly everyone can afford them	Developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want
Key Features	Stable demand Large, homogeneous markets Low cost, consistent quality Standardized goods and services Long product development cycles Long product life cycles	Fragmented demand Heterogeneous niches Low-cost, high quality, customized goods and services Short product development cycles Short product life cycles

Note: From *Mass Customization: The New Frontier in Business Competition* (p. 47), by J. B. Pine, 1993, Boston, MA: Harvard Business School Press.

In the same book Pine (1993, p. 48) also lists the required enablers in order for mass customization to become a reality: (1) advances in the speed, capacity, effectiveness, efficiency, and usability of information and telecommunications technologies; (2) just-in-time strategies; reduction of setup and changeover times; (3) compression cycle times throughout all processes in the value chain; and (4) production upon receipt of an order (instead of forecasts only).

Several important contributions to the mass-customization literature have followed Pine's work (e.g., Kotha, 1995; Lampel & Mintzberg, 1996; Pine, 1993). These studies found that customization has been an aspiration and a challenge for producers and marketers for the duration of the last century (Radder & Louw, 1999). It is an aspiration because, according to the American Marketing Association, the aim of a marketer should be "to create exchanges that satisfy individual goals" (Bennett, 1988, p. 54). It is a challenge because the identification and fulfillment of the wants and needs of individual

customers has meant some kind of sacrifice in effectiveness, efficiency, or costs (Pine, 1993). Mass customization is not just “continuous improvement plus” (Pine, Victor, & Boynton, 1993, p. 108). As the failures and struggles of many companies (e.g., Toyota, Nissan, Mitsubishi, Mazda, Amdahl) attempting to achieve mass customization suggests, businesses have to be careful to notice that not all markets are appropriate for mass customization. At the same time, the concept of mass customization appeals to managers because it has made possible for some companies, which include among others Motorola, Bell Atlantic, and Hallmark (Pine et al., 1993), to achieve low costs, high quality, and the ability to make highly varied, often individually customized products.

Within the last two decades the gap between the theoretical notion of mass-customized products and the reality has been reduced considerably, and it is expected that it will get narrower in the future (Piller & Moslein, 2002). The bridging of the gap can be ascribed to the development of new technologies that have allowed the offering of mass-customized products without sacrificing efficiency and effectiveness for producers and marketers or increasing cost for consumers. As Davis (1987) states, technology seems to be the key enabler of mass-customized products.

As briefly mentioned in the introduction, technology has also allowed the existence of two types of mass-customized products: (1) made-to-order products that require the producer or seller to perform the required tasks to offer the customized final item (i.e., require information from the consumer, transfer that data to the production process, and create the offering to match the consumer’s indications as closely as possible), and (2) products that do not require the intervention of the producer or seller to be customized. In the latter case, the consumer does not need to provide the producer

with his/her information for the manufacturer to make his/her choice a reality. The consumer is the “maker” of the customization. This approach to mass customization has been labeled a *prosumer* approach (Lee, Barua, & Whinston, 2000) in which the product is so flexible that consumers can customize it themselves. In a similar fashion, in the context of Web-based applications, the approach to making tailored recommendations is known as *personalization* (Volkov, 1999).

Both types of mass-customized products (made-to-order and prosumer done) already exist in the marketplace. Several examples of the first type are customized cosmetics (i.e., Prescriptives offering individualized makeup colors to consumers), clothing (Levi jeans), and wall paint (color customized at the store). Illustrations of the second type of products (Pine, 1993) are the “self-adjustable office chair” and the fully adjustable air bed that allow users to individually select the firmness and support that the mattress offers. Other examples of technology products are end-user software that comes with a preference function to customize its interface (Lee, Barua, & Whinston, 2000), cellular phones that can be customized by ringers, tones, covers, and so on, and computers whose hardware and software are mainly designed by the buyer (e.g., Dell computers).

The prosumer approach differs from the traditional mass-customization approach in the following three aspects: (1) the consumer does not need to provide the seller/provider with his/her preference information in order to get the customized product, which means that privacy is not an issue; (2) the consumer chooses what, how, and when to customize, and, therefore, convenience for the user is greatly improved; and (3) the

burden of the customization process shifts from producer to consumer, which also helps lower production costs.

Several researchers (Duray & Milligan, 1999; Gilmore & Pine, 1997; Huffman & Kahn, 1998; Lampel & Mintzberg, 1996; Piller, 2002; Piller & Moeslein, 2002) have analyzed the process of made-to-order products in the literature. However, fewer scholars have focused on the prosumer approach to mass customization. Building on established literature in consumer behavior (Eagly & Chaiken, 1993; Fishbein & Ajzen, 1975; Staw & Ross, 1985) and information systems (Davis, 1986; 1989; 1993), this study attempts to fill the void and bring some understanding of the prosumer approach to mass-customized products.

High Technology and Marketing

To better understand what is meant by *high technology marketing*, it is necessary to define and clarify what is understood by this concept. In order to do so, first, this section will define *high technology*. Next it will show how *high technology* and *marketing* have come together in the literature.

The difficulty of defining *high technology* arises from the complexity of a dual term construct in which it is necessary to understand both the words *high* and *technology*. Therefore, this brief discussion will start with what is understood by *technology* followed with several definitions of *high technology* before getting into more detail about *high technology marketing*.

The American Heritage Dictionary of the English Language (2000) defines “technology” as:

1. Greek *tekhnologia*, systematic treatment of an art or craft:
 - a. The application of science, especially to industrial or commercial objectives.
 - b. The scientific method and material used to achieve a commercial or industrial objective.
2. Electronic or digital products and systems considered as a group: a store specializing in office technology.

John, Weiss, and Dutta (1999) defined technology as what “. . . refers to scientific knowledge applied to useful purposes or know-how” (p.79). Capon and Glazer (1987) indicated that technology refers to “the information required to produce and/or sell a product or service” (p. 2). They continued by stating that it is based on two components: (1) product technology (ideas related to the product and its components) and (2) process technology (ideas involved in the manufacture of a product). In their words it is “a real asset from which the firm should seek to extract the maximum return” (p. 2).

From the previous and other similar definitions, it seems clear that technology has to do with science and/or the scientific method as well as with other more common ideas associated with technological devices. Also, as the previous definitions show, concepts and ideas relating to information and management are brought to attention when defining technology.

Mohr (2001) tells us that there are as many definitions of high technology as there are people studying it (for an interesting discussion on defining high tech, see Mohr, 2001, p. 4). Some of these definitions are based on an industry-based approach in which industries have to meet certain criteria to be labeled as high tech. For instance, they must have a certain number of technical employees or spend certain amounts of money on research and development. Mohr advocates for a different definition of high tech based

on underlying common characteristics that all high-tech industries share (Moriarty & Kosnik, 1989). These common characteristics are summarized as market uncertainty, technology uncertainty, and competitive volatility.

To sum up, as the previous discussion shows, *high technology* is a dual term that has to be placed in a context, i.e., high-tech industry or high-tech products. The construct embodies different conceptualizations depending upon the context and even the person who is referring to it.

Within the marketing literature a significant number of scholars have focused on technology, more than high tech per se, in an organizational context (Cahill, Thach, & Warshawsky 1994; Cahill & Warshawsky, 1993; Capon & Glazer, 1987; Chandrashekar & Sinha, 1995; Dhebar, 1996; Gatignon & Robertson, 1989; John, Weiss, & Dutta, 1999; Robertson & Gatignon, 1986; Srinivasan, Lilien, & Rangaswami, 2002). However, this focus has been much more limited in the field of consumer behavior (Mick & Fournier, 1998). According to John et al. (1999) “our current understanding of technology intensive markets is sparse, disparate, and without consensus” (p.78). Moreover, when moving into the realm of high-technology marketing, academic research is scant although several important contributions have emerged (Mohr, 2001; Moriarty & Kosnik, 1989; Shanklin & Ryans, 1984).

Based on a review of the literature on marketing and high technology, several conclusions can be drawn. First, for a business to be labeled as *high-tech*, it has to meet three criteria according to Shanklin and Ryans (1984): (1) the business requires a strong scientific-technical basis; (2) in the particular business, new technology can quickly make the product obsolete; and (3) as new technologies emerge, their applications create or

revolutionize markets and demand. Second, “marketing high technology products and innovations is not the same as marketing traditional products and services” (Mohr, 2001, p. xi). Mohr argues that, in general, high-tech products are less familiar than traditional consumer products and, therefore, provoke different reactions and behaviors in their customers. The fact that high-tech products, compared to familiar consumer products, can provoke fear, uncertainty, and doubt regarding usage, for instance, require marketers to implement special marketing practices and theories (Mohr, 2001). Not only are these types of products less familiar to consumers in their existing form, they change rapidly due to technological breakthroughs, which make potential consumers even more skeptical about buying.

As previously stated, this study focuses on CCHT products. Some of the reasoning to justify this choice is based on the growing importance of studying high-technology products and how consumers react toward these types of products. In that sense, this research will follow Mohr’s philosophy of high-tech products needing special practices and research. Moreover, according to the *Science and Engineering Indicators* of the National Science Foundation (2002), the global market for high-tech goods is growing at a faster rate than that for other manufactured goods, and high-tech industries are driving economic growth around the world. Choosing to focus on CCHT products, the current work aims to contribute to expanding the knowledge about the marketing of high-tech products.

Attitudes Toward Using CCHT Products and Intention to Use CCHT Products

Following Allport's definition (1935), attitudes are typically defined as learned predispositions to respond to an object or class of objects in a consistently favorable or unfavorable way. In classical attitudinal theory, the importance of studying attitudes rests on the connection between the attitude toward the particular object and the consequent behavior toward the object that this attitude will produce (Allport, 1935; Eagly & Chaiken, 1993; Fishbein & Ajzen, 1975; Rosenberg, Hovland, Abelson, McGuire & Brehm, 1960; Staw & Ross, 1985). If attitudes and behavior are highly correlated, then the behavior of a person can be predicted once her attitude has been established (Ajzen & Fishbein, 1977).

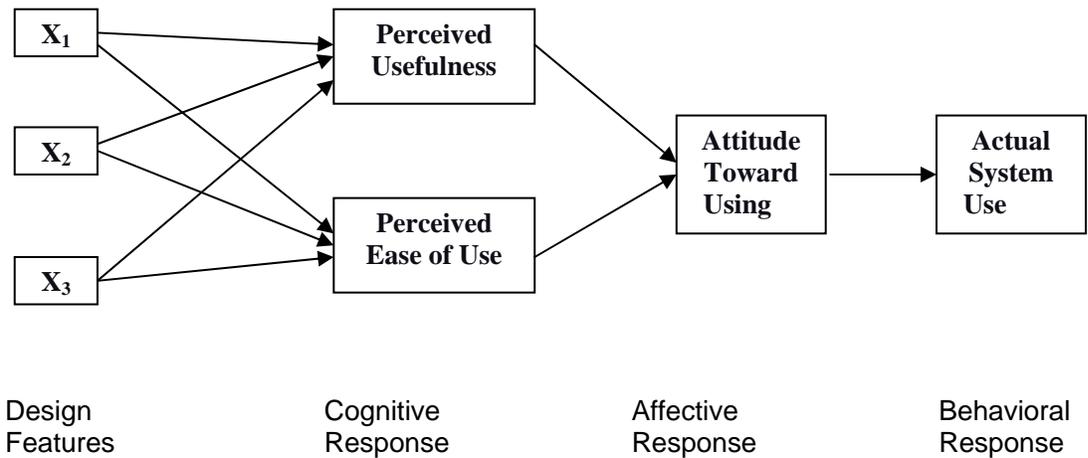
One theory that refers to this correlation and has been relevant in the consumer behavior field is the hierarchy of effects model. In 1961, Lavidge and Steiner introduced what they called the "stair-step" model that explained consumer behavior toward intention to purchase. The rationale behind this model is that first, beliefs are formed about a brand or a product; secondly, influenced by those beliefs, attitudes toward the brand or the product are consequently formed; and finally, from these attitudes individuals will develop an intention to buy or not buy the particular brand or product. This theory is important because it provides a basis for defining key elements that influence consumer behavior (Assael, 1998). For this research, the key part of this theory lies in the idea that attitudes are formed first and those will influence how consumers act consequently with regard to the particular brand or product.

In the context of studying attitudes and technology, several scholars have made important contributions to the literature (Chandrashekar & Sinha, 1995; Davis, 1986; Gatignon & Robertson, 1989; Robertson & Gatignon, 1986; Srinivasan, Lilien, & Rangaswami, 2002). Pertinent to the current research, Davis's (1986) study of individuals' attitudes toward using new information systems and computer-based products is of special interest. Davis suggests that an individual's attitude toward using a new system leads to the individual's behavioral intention to use that system. Moreover, the theory of diffusion of innovations (Rogers, 1962) indicates that the positive or negative attitude toward the innovation would result in the more permanent adoption or rejection of the innovation. Therefore, based on the existing literature about attitudes toward a brand or product, attitudes toward innovations and attitudes toward using a particular system, the following hypothesis is proposed:

H₁: An individual's attitude toward using CCHT products is positively related with his/her intention to use them.

In this vein, Davis (1986) developed the Technology Acceptance Model (TAM) to explain the effect of system characteristics on user acceptance of computer-based information systems. Figure 1 depicts the TAM model developed by Davis.

Figure 1. *Technology Acceptance Model*



Note: From *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results* (p. 24, by F. D. Davis, 1986, Doctoral Dissertation, Sloan School of Management, MIT).

Davis’s model is based on Fishbein and Ajzen’s work (Ajzen, 1980; Fishbein, 1967; Fishbein & Ajzen, 1975) on the Theory of Reasoned Action. In his TAM model, Davis (1986) claimed that the attitude toward using a system is a function of two major beliefs, “Perceived Ease of Use” (PEOU) and “Perceived Usefulness” (PU). Based on this established theoretical grounding, the TAM model has been widely applied in the IS field (Lederer, Maupin, Sena, & Zhuang, 2000) and is useful in explaining attitudes and behaviors toward IS systems as well as certain types of technology (i.e., Branscomb & Thomas, 1984; Davis, Bagozzi & Warshaw, 1989). Extending these findings to the current study, perceived ease of use and perceived usefulness are used to explain consumers’ attitudes toward CCHT products. Hence, the following hypotheses are presented:

- H₂: When Perceived Ease of Use (PEOU) of the CCHT product is high (low), the attitude toward using the CCHT product will be positive (negative).
- H₃: When Perceived Usefulness (PU) of the CCHT is high (low), the attitude toward using the CCHT product will be positive (negative).

Perceived Ease of Use, Perceived Usefulness, and Perceived Customization/Customizability

The importance of the perceived usefulness and perceived ease of use of different types of systems has been well documented and studied. Different items have been used to capture the nature of these constructs or similar ones. For instance, Schultz and Slevin (1975) referred to *performance* in a similar way as what is today considered perceived usefulness. Later on, Bailey and Pearson (1983) introduced two instruments to measure computer user satisfaction closely related to perceived usefulness and perceived ease of use. These two instruments contained semantic differential scales of usefulness (*relevance, perceived utility, and job effects*) and ease of use (*flexibility of system, understanding of system, feeling of control, and error recovery*). It was Davis (1986) who, from the previous findings in the literature, established well-recognized definitions and measures for perceived ease of use and perceived usefulness in the context of using particular systems. In Davis's (1989) words, perceived ease of use refers to "the degree to which a person believes that using a particular system would be free of effort" (p. 320). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320).

As seen from Davis's definitions, perceived usefulness and perceived ease of use are typical perceptions in the tradition of work using belief constructs. In traditional perceptual theory, *perception* is explained as a complex method of attaining information about our surrounding world, specifically through our senses, and apprehending this information as beliefs (Noe, 2002). In marketing, Assael (1998) adapted this concept and defined perception as the "selection, organization and interpretation of marketing and environment stimuli into a coherent picture" (p. 206). Perception is important for marketers because it is how the consumer first becomes aware of a product and its relative value.

Related to perception, the critical aspect for this study is that once consumers select and organize the stimuli to which they are exposed, they interpret them through two processes: categorization and inference (Assael, 1998). Categorization involves the classification of products or brands into similar conceptual containers. Inference refers to the beliefs about the particular object being perceived that the consumers develop from past associations or experiences. Therefore, when consumers deal with a CCHT product, they will use categorization and inference processes to develop beliefs about that product. In particular, his research is interested in the beliefs about the perceived ease of use and the perceived usefulness of that product. While a product perceived as highly customizable may be deemed useful, it may not be perceived as easy to use as it requires learning and getting used to. By the same rationale, the same product may be perceived as very useful even if the consumer recognizes that it is not so ease to use. Consequently, the following hypotheses are posited:

- H₄: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Ease of Use (PEOU) of that product will be low (high).
- H₅: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Usefulness (PU) of that product will be high (low).

Technology Readiness

One critical aspect when studying consumers and technology has been to analyze individual characteristics as antecedents of embracing new technology products. For instance, Moore (1991) developed the technology adoption life cycle (p. 9) as a model for understanding the acceptance of new products. Following classic theory of adoption of innovations (Mahajan & Bass, 1990; Rogers, 1962; Rogers, 1976) Moore (1991) proposed a model that describes the market penetration of any new technology product in terms of a progression in the types of consumers it attracts throughout its useful life (p. 11). The model classifies consumers into different psychographic profiles from innovators to laggards depending on their response to the new technology. In the same context, other authors have paid attention to specific individual traits like innovativeness (Chandrashekar & Sinha, 1995; Citrin, Sprott, Silverman, & Stern, 2000; Foxall & Bhate, 1999; Steenkamp, Hofstede, & Wedel, 1999) or technology readiness (Parasuraman, 2000). In this study, due to the specific choice of CCHT products, it is argued that technology readiness is a critical variable that will help us understand consumer attitudes toward using CCHT products.

Parasuraman (2000) has defined “technology readiness” as an overall state of mind that refers to “people’s propensity to embrace and use new technologies for

accomplishing goals in home life and at work” (p. 308). In his conceptualization, a combination of positive and negative feelings about technology underlies the domain of technology readiness. This research argues that this state of mind relates to how ready an individual feels about using a particular technology (or a CCHT product in this study) will affect how ready that consumer is to accept and use the CCHT product. A technologically ready consumer is more likely to see a CCHT as easy to use.

In H₄ it was proposed that the perception of customization/customizability for a CCHT product will affect how easy to use that product is perceived to be by the consumer. As an extension of this hypothesis, and based on Parasuraman’s (2000) discussion of technology readiness, now it is stated that technology readiness will moderate the relationship between perceived customization/customizability and perceived ease of use of the CCHT product. Therefore it is hypothesized that:

- H₆: Technology Readiness moderates the relationship between PEOU and Perceived Customization/Customizability (PC). When Technology Readiness is high (low), PEOU will be high (low) for the perceived levels of PC of the CCHT.

Customer Customization Sensitivity

According to Hart (1995), when businesses consider pursuing a mass-customization strategy, they need to examine four factors in order to attain successful implementation: (1) customer customization sensitivity, (2) process amenability, (3) competitive environment, and (4) organizational readiness. Of these four factors, the last three pertain to the realm of the business and its environment and the first refers specifically to the consumer.

Hart (1995) refers to customer customization sensitivity as “[it occurs when] your customers care whether you offer more customization” (p. 40). He emphasizes that customer customization sensitivity is based on two factors: (a) uniqueness of customer needs and (b) customer sacrifice. Uniqueness of customer needs depends on the type of product being offered. For instance, in the same discussion, Hart (1995) indicates that a commodity product like salt will not generate different needs in customers. However, if customers are considering investment counseling “the needs of each customer will be absolutely unique because nobody will settle for anything not perceived as tailored precisely to his or her needs” (p. 40). Customer sacrifice refers, in Hart’s words, to “the gaps between the product or service benefits desired by customers and the product or service benefits actually provided by the suppliers in the market” (p. 40). He concludes his discussion stating that a high level of unique needs and/or customer sacrifices will generate a high customization sensitivity level. By the same logic, a low level of unique needs and/or customer sacrifices will produce a low customization sensitivity level.

Defining Customer Customization Sensitivity

Building on Hart’s discussion of customer customization sensitivity, this study considers that consumers will have varying inclinations toward customization in general and toward different types of mass-customized products and services in particular (i.e., some individuals may want to have their clothes customized, while others will just not bother about customizing clothing, but need the capability of personalizing their mobile telephone). Since different people have varying needs for customized products and services, it is critical for practitioners and marketers to know how important

customization is for potential consumers as well as how it varies by type of product and service. Knowing how important customization of specific products is for consumers will help marketers to implement customization strategies for the marketing of those particular products. Moreover, the different needs for customization of products varying by different groups of consumers can help managers develop segmentation strategies for their products.

In this study, embodying Hart's conceptualization, customer customization sensitivity is defined as the *customer's preference for customized products/services*. This preference is based on a general internal inclination or predisposition to select customized products (when given the option), uniqueness of customer needs, and perceived downside/limitations in using not customized products/services. In other words, this definition implies that consumers will have an inherent preference for customized products and this preference can vary depending upon personal characteristics.

Customer Customization Sensitivity and Related Constructs

In consumer behavior research many factors have been studied that influence consumer decision making and behavior. Some of these factors are socioeconomic and demographic (Cunningham & Cunningham, 1973; Prasad, 1975), personal characteristics (Midgley & Dowling, 1978), extrinsic and environmental characteristics (Burke, 2002), manufacturer or brand reputation (Chaudhuri, 2002), price, and refund or exchange privileges (Ackerman & Tellis, 2001; Campbell, 1999; Winer, 1986).

Customer customization sensitivity as an individual trait is consistent with multiple research perspectives on personal characteristics and underlying dispositions

that have helped to explain consumer behavior in different settings (Hirschman, 1980; Midgley & Dowling, 1978; Steenkamp, Hofstede, & Wedel, 1999; Tansuhaj, Gentry, John, Manzer, & Cho, 1991; Veryzer, 1998; Zaichkowsky, 1994). Relating to adoption of technologies some of these personal traits have referred to how prone consumers may be to adopt a particular technology. Rogers and Shoemaker's (1971) categorization of people as innovators, early adopters, majority, or laggards falls into this type of research.

Another important characteristic that has been studied in the context of technology and consumers is innovativeness. Rogers (1962) defined innovativeness as the degree to which a person adopts an innovation earlier than other members of his or her social context. Midgley and Dowling (1978) and Hirschman (1980) refer to consumer innovativeness as an underlying disposition which is not tied to the innovation. Steenkamp et al. (1999) defined consumer innovativeness as the predisposition to buy new and different products and brands rather than remain with the previous choices and consumption patterns.

Similar to innovativeness, customer customization sensitivity refers to an underlying predisposition that can affect behavior in the context of using and buying customizable products. Customer customization sensitivity is different from other related concepts important to consumer behavior and technology, including involvement (Hartwick & Barki, 1994; Zaichkowsky, 1985; 1986; 1994), perceived risk (Grobe & Douthitt, 1995; Hoover, Green, & Saegert, 1978; Sneath, Kennett, & Megehee, 2002), and novelty-seeking (Dabholkar & Bagozzi, 2002; Farley & Farley, 1967; Hirschman, 1980).

Involvement refers to a motivational construct which partly relies on the person's values and needs (Zaichkowsky, 1986). Another conceptualization of involvement in the context of advertising refers to an internal state of arousal based on intensity, persistence and direction (Andrews, Durvasula, & Akhter, 1990). Customer customization sensitivity is not considered a motivational characteristic that would act upon a particular stimuli (like the case of consumers feeling more or less involved depending on the product or the situation), but as an underlying trait that is always present in the individual mind.

Perceived risk has been examined extensively in the consumer behavior literature. The basic tenet of perceived risk is that consumers are sensitive to both the probability and the extent of potential loss associated with a purchase (Macintosh, 2002). Moreover, it is generally accepted that individuals are motivated to reduce risk through different strategies like doing more extensive search (Beatty & Smith, 1987), or by being more loyal to brands or products (Locander & Herman, 1979). Customer customization sensitivity, as defined in this research, can be connected to perceived risk. It could be theorized that perceived risk could act as an antecedent of customer customization sensitivity because the perceived risk associated with buying and using CCHT products could affect how customizable the consumers may want those products.

Finally, in a similar way to the relationship of customization sensitivity and perceived risk, customer customization sensitivity is associated with novelty-seeking behaviors. Novelty-seeking individuals could be more interested in customizable products that are perceived as novelty products in the consumer mind. In that sense, how high or low an individual rates in his or her desire to seek out new and/or different products could have an impact on how important customization is for that consumer.

Again, novelty-seeking, as an individual trait, could be considered an antecedent of customer customization sensitivity.

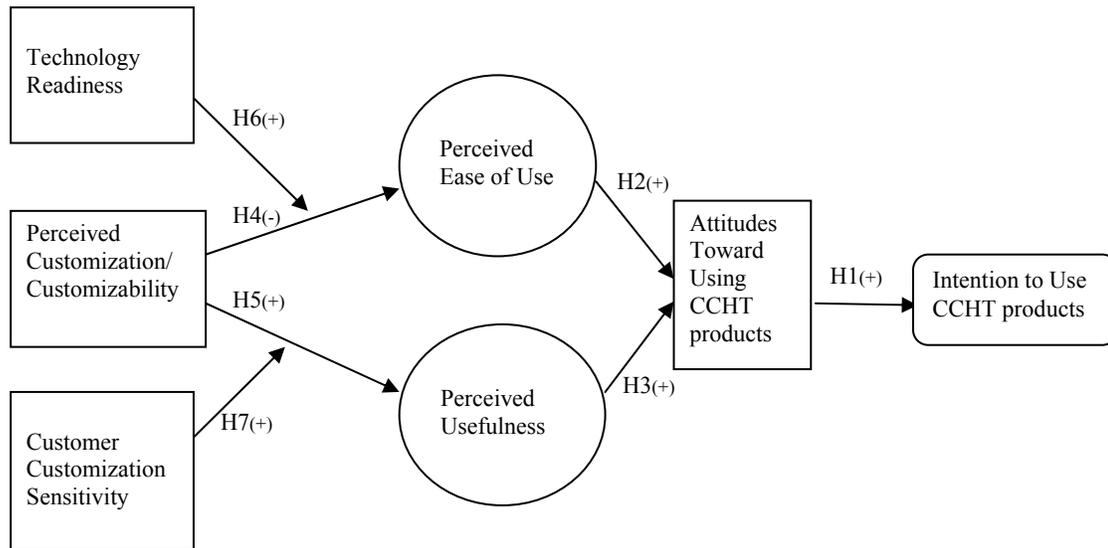
As stated at the beginning of this section, for the purposes of this study, the focus lies on the first dimension of customization sensitivity. This dimension refers to the general susceptibility toward preferring customized products when given the option. It is argued that customization sensitivity will moderate the relationship between perceived usefulness and perceived customization of the product. More specifically, H₅ proposed that the perception of customization/customizability for a CCHT product will affect how useful the product is perceived to be by the consumer. Next, it is proposed that this effect will be moderated by the customer customization sensitivity. Therefore, the following hypothesis is introduced:

H₇: Customer Customization Sensitivity moderates the relationship between PU and PC. When Customization Sensitivity is high (low), PU will be high (low) for the perceived levels of PC of the CCHT.

Model Development

In this chapter, a review of the literature has been provided with the intention to develop a model (see Figure 2) that will help to better understand consumer attitudes toward using CCHT products.

Figure 2. *Proposed Conceptual Model*



Through the proposed conceptual model, this research aims to extend and adapt the TAM model for explaining attitudes toward using CCHT products. It is suggested that intention to use CCHT products is directly related to attitudes toward using these products.

TAM literature directly relates perceived ease of use and perceived usefulness to an individual's attitude toward using a particular technology (the behavioral component of the attitude). In the proposed model in this study, two of the three components of attitudes: behavioral (usage) and affective (attitude) are accounted for. It is hypothesized that besides perceived ease of use and perceived usefulness there are other critical variables that will affect how consumers use and perceive CCHT products. Due to the particular characteristics of CCHT products, it is argued that, in this context, technology readiness and customization sensitivity are two of those key variables.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

In the previous chapter the theoretical background for the proposed model was introduced. Also the hypotheses to be tested within the proposed model were presented. This chapter contains a discussion of the methodology that was used to test those hypotheses. The organization of the section is as follows. First, the research design is introduced followed by a description of the studies that were performed.

Next, a description of the operational definitions of the constructs of the proposed model as well as the measures is presented. Finally, the specific analytical procedures that were used to test the proposed model will be discussed.

Research Design

As stated previously, the objectives of this research are: (1) to develop and test a conceptual model that will help explain consumers' attitudes toward using CCHT products, (2) to examine how perceived customization/customizability of CCHT products will impact the perceived usefulness and ease of use of those products, (3) to discover if consumers differ in their intentions to use CCHT products based on how easy to use and useful they perceive these products to be, and (4) to analyze the impact of people's readiness to use technology as well as the impact of people's sensitivity toward customizability on their attitudes to use CCHT products.

The current investigation is composed of three studies: the first study was required for the development and pretesting of scales for perceived customization and consumer customization sensitivity; the second study was a pretest for the development

of scenarios for testing the model; and the third constituted the main investigation of the hypothesized model with a single-factor between subjects study.

Study One

The first part of the investigation consisted of scale development for the *perceived customization* and *customer customization sensitivity* constructs. Both concepts are an important part of the proposed model and, to date, there are no valid instruments to measure them. The development process was the same in both instances and therefore they will be described in parallel. Results will be presented separately.

Churchill (1979) outlined several steps for developing measures of marketing constructs. In particular, he proposed the need to perform two studies in the development of a valid and reliable scale. The first study consists of a pretest that will determine the items that would be retained in the main study. The second or main study evaluates the robustness of the scales intended to measure particular constructs.

Domain of Constructs

After a careful review of the literature on mass customization and personalization, the definitions for the constructs of interest were derived. Perceived customization is defined as *the degree to which a person believes that a particular product/service or the features of that product/service are or can be customized to meet unique needs for individual consumers (including himself/herself)*. The logic behind this is the fact that customization, per se, can be perceived differently by different individuals. How individuals and consumers perceive their world has been widely studied in the psychology and consumer behavior literature (Gefen & Straub, 1997; Monroe, 1973;

Newell & Goldsmith, 2001; Rao, 1971; Singhapakdi, Rawwas, Marta, & Ahmed, 1999; Zeithaml, 1988). Based on the review of the literature it seems that what a person thinks about the customization possibilities of a particular product or its features will have an impact on attitude toward that product.

As stated in the review of the literature section, in this research customer customization sensitivity is defined as the *customer's preference for customized products/services*. As mentioned earlier, this preference is based on a general inclination to select customized products (when given the option), uniqueness of customer needs, and perceived downside/limitations in using noncustomized products/services.

Initial Set of Items

To develop an initial set of items for both constructs, a careful literature review on mass customization as well as 10 in-depth interviews with adult consumers were carried out. Because the two concepts of customer customization sensitivity and perceived customization deal with customization issues, the interviews helped to uncover dimensions for both constructs. The objective of the interviews was to explore the ideas and opinions that consumers held about customization and personalization. Individuals were asked a series of questions to provoke thinking about customization and personalization. After careful consideration of the literature and the information gathered from consumers, a pool of 28 and 21 potential items was generated that, respectively, reflected the dimensions of customization sensitivity and perceived customization.

Next, to establish content validity, the recommendations of Zaichkowsky (1985) and Babin and Burns (1998) were followed. Three academic colleagues were asked to determine if the items obtained were representative of the scales' domains. These experts

had the definition of the constructs to evaluate the potential items and rated the relevance of each item in relation to what they were intended to measure (DeVellis, 1991, p. 75). If an item was determined to be an appropriate measure by the three judges, it was retained for initial psychometric assessment. From the initial pool of 28 items for consumer customization sensitivity, 12 were short-listed by the above process. In the case of the perceived customization instrument, out of the 21 original items, 12 were also retained.

Data Collection

The collection of data involves two studies. First, a pretest helped to come up with the purified items that would be used for the main study. In the pretest (Appendix A), the 12 selected items for each construct were used to assess psychometric properties of the scales. In the case of the perceived customization scale, the definition involves the opinion of an individual about a particular product and, therefore, respondent opinions on a hypothetical product (cellular phone) were obtained. For the construct of customer customization sensitivity, the instrument was administered just by asking respondents to give their opinion on customization issues because it was defined in terms of a personal trait.

The pretest sample was composed of 59 students from a university located in the urban area of a large Southern city of the United States. In spite of the controversy on using student subjects in measurement development research (Burnett & Dunne, 1986; Wells, 1993), many researchers use them as effective surrogates for adults in empirical research (Mohr, Eroglu, & Ellen, 1998; Newell & Goldsmith, 2001), especially for scale development and theory testing. Following this established tradition, it was decided that using such a sample would be appropriate for the purposes of the pretest.

Analysis and Results

In order to select the items that would enter the main study, an exploratory factor analysis (see Table 2) was conducted and the internal consistency of the purified scales was measured (Anderson & Gerbing, 1988; Churchill, 1979).

Table 2.
Scale Development

	Perceived Customization	Customer Customization Sensitivity
N	59	59
# Items retained from FA	7	5
Total Variance Explained	57.99%	63.82%
Alpha Reliability	0.85	0.87

From the results of the factor analysis using principal axis factoring, five items for the customization sensitivity scale and seven items for the perceived customization scale were retained. Those items retained from each scale loaded on single factors. All the items had loadings above 0.50 (Hair, Anderson, Tatham, & Black, 1998). The Cronbach's α coefficient for the perceived customization scale was 0.87 and 0.85 for the customization scale, both of which are considered acceptable in the literature (Carmines & Zeller, 1980; Nunally & Bernstein, 1994; Peterson, 1994).

In sum, and given the results from this first study, it appeared reasonable to proceed with further analysis. Therefore, the new developed scales for perceived customization and customer customization sensitivity would be used in the main study.

Moreover, the main study will provide an opportunity to retest and verify the reliability and validity of the scales in a greater context.

Study Two

The main objective of the second study of this investigation was to develop and test scenarios for the experiment in which the independent variable of perceived customization is manipulated. Many researchers have used scenario-based manipulations in consumer research (Bettman, Roedder & Scott, 1986; Forward, Canter, & Kirsch, 1976; Friedrich, Barnes, Chapin, Dawson, Garst, & Kerr, 1999; Hill & Ward, 1989; Mowen, Fabes, & LaForge, 1986; Nord & Peter, 1980). This methodology allows for examination of the variable of interest and is especially suited for theory testing (Weiner, 2000).

The first step of the second study was to identify plausible CCHT products for the development of scenarios. For this purpose, it was necessary to identify a product with several key characteristics. First, it had to be a *high-tech* product. As explained earlier, *high-tech* products in this research means those products whose development is based on a strong scientific-technical basis; those that can quickly make existing technology obsolete; and those whose application creates or revolutionizes markets and demand (Shanklin & Ryans, 1984). Second, the product had to be consistent with the prosumer approach described earlier. Finally, the goal was to identify a product that consumers would be familiar with and would feel comfortable using.

Four potential products were initially identified: cellular phones, cordless phones, personal video recorders, and websites. To meet the criteria previously established,

cellular phones were finally selected for pretesting. Next, in order to get a better idea of how real cellular phones are presented to potential consumers, several websites and printed literature of cellular phone makers and retailers were examined. This close examination led to a description of the most common features that nowadays can be found in the marketing of cell phones to consumers. After thorough consideration of all the gathered information, two potential scenarios (high/low cell phone) were developed for the two conditions of high and low customization/customizability (see Appendix B, original cell phone scenarios). The goal when developing these scenarios was to describe two realistic products and/or their features that had already existed or could exist in the marketplace. These were the scenarios that were presented to respondents for the original pretest.

Pretest and Manipulations Checks

To find out if the manipulation of perceived customization worked as expected, the perceived customization/customizability scale developed in study one was used to ask respondents about each scenario. Each administered questionnaire contained the description of a cellular phone. Participants responded to the manipulated treatment by answering the items of the perceived customization scale in a seven-point range from strongly disagree (1) to strongly agree (7). They also were requested to give any feedback regarding the scenarios they thought could make them more credible or realistic. These questionnaires were then administered to a total student sample of 80 subjects who were asked to rate the products. The sample subsets were 41 subjects for the low cell phone condition, 39 for the high cell phone condition. Table 3 shows the results for the mean comparisons of the high versus low manipulation conditions.

Table 3.
Manipulation Checks for Scenarios (Original Pretest)

	n	Mean	Std Deviation	t-value
Cell Phone				
Low	41	2.75	1.27	8.893*
High	39	5.05	1.02	
Degrees of freedom	74			

* significant at the 0.001 level

As can be observed from the table, respondents in the high condition for the cell phone rated it as being highly customizable versus those who were given the low condition ($M_{\text{high}} = 5.05$, $M_{\text{low}} = 2.75$, $t\text{-value} = 8.893$, $p < .001$).

From the obtained results, the manipulations for the scenarios were perceived as intended and the differences between high and low conditions were all significant at the 0.001 level. In spite of these acceptable results, the author was concerned with obtaining a good fit for the scenarios with reality. To achieve this objective a new format for the scenarios based on the feedback provided by the participants was developed (see Appendix B, final cell phone scenarios). This new format was tested with a second pretest. To attempt to capture a good fit with reality, measures for familiarity with the product (see Appendix C) based on Machleit, Allen, and Madden (1993) and realism (see Appendix C) based on Harris (2002) were included in the questionnaire.

Familiarity with an object has been defined as “the extent of consumer’s prior experience with or knowledge of that object” (Volkov, 1999, p. 57). Marketing literature has shown that individuals who are familiar with a product are less likely to be diverted by weak indirect cues, and therefore they are more likely to focus on the intrinsic attributes of a product (Kent & Allen, 1994; Machleit & Wilson, 1988; Machleit et al.,

1993; Wedel, Vriens, Bijmolt, Krijnen, & Leeﬂang, 1998). Because familiarity affects the information processing behavior of individuals, it was considered appropriate to measure it during this second pretest. Moreover, as explained earlier, to determine whether the manipulation of scenarios was perceived as intended and whether they were believable and realistic to respondents, a realism scale (Harris, 2002) was also presented to the respondents.

Again, questionnaires with the new formatted scenarios (see Appendix C) and the measures for familiarity and realism were administered to a student sample of 84 who were requested to rate the products. This time the sample consisted of 43 subjects for the low cell phone condition and 41 for the high cell phone condition. Table 4 shows the results for this second pretest of the scenarios.

Table 4.
Manipulation Checks for Scenarios (Second Pretest)

	n	Mean	Std Deviation	t-value
Cell Phone				
Low	43	5.16	0.96	7.09*
High	41	3.33	1.36	
Degrees of freedom	84			

* significant at the 0.001 level

From Table 4 it appears that, as expected, respondents in the high condition for the cell phone rated it as being highly customizable versus those who were given the low condition ($M_{high} = 5.16$, $M_{low} = 3.33$, $t\text{-value} = 7.09$, $p < .001$). This result supports the manipulation check and the perceived differences between high and low scenarios for the cell phones. Next, Table 5 shows the results for the inquiry about familiarity and realism.

Table 5.
Results for Familiarity and Realism

	Realism		
	Mean	Standard Deviation	Sample Size
High Cell Phone condition	5.72	0.14	41
Low Cell Phone condition	5.44	0.12	43
Familiarity with product			
Combined High/Low conditions	5.78	0.73	84

Note. Realism and Familiarity were measured with a five-item scale and a three-item scale respectively. Both were rated with a score from 1 to 7. The higher the score, the greater the realism and the familiarity.

As seen from Table 5, the subjects felt very familiar with the presented product as well as considered the scenarios fairly close to reality. These results seem to indicate that these scenarios are familiar to respondents and do not violate realism.

In summary, from the pretest results, the manipulations for the scenarios were perceived as intended and the differences between high and low conditions were all significant at the 0.001 level. Since the desired manipulation was achieved and the conditions of familiarity and realism were also met, the scenarios were considered appropriate to be used for the main study.

Study Three

The previous sections described the preliminary studies that were required for the final hypothesis testing of the proposed conceptual model. With study three, as previously stated, this research is concerned with analyzing the effect of a single research factor (perceived customization/customizability) on the dependent variables. A between subjects analysis is appropriate whenever a score for the dependent variables is determined only once (Bakeman, 1992), as in this study's case. Therefore, an experiment-based research design with a single-factor between subjects study was utilized.

Prior research dealing with consumers and technology has relied on surveys to perform their analysis and, hence, data was gathered using an experimental instrument employing Likert-type and semantic differential scales to measure the constructs of interest. An experimental questionnaire was developed primarily using adaptation of the scales validated from existing literature and from the two scales developed in study one. Because one of the objectives when testing the proposed model is to assess differences in attitudes based on perceived customization of products, respondents were randomly assign to the two conditions of high and low perceived customization /customizability.

The stimuli for the main study were the two scenarios developed in study two (high-low perceived customization/customizability of a cellular phone). Even with the care that was used to develop and test the scenarios in study two, an argument can be made about the appropriateness of each scenario, and therefore, an additional measure was taken to ensure the validity of the scenarios. Several expert judges in marketing and technology were contacted to determine the plausibility and face validity of the scenarios.

After this process, it was confirmed that the developed scenarios for cellular phones would be realistic and appropriate for the purposes of the current study.

Each experimental questionnaire (see Appendix D) began with an introductory page thanking respondents for participating and giving them instructions on how to proceed. An equal number of the high and low conditions of the cellular phone scenarios were shown to respondents. Subjects were randomly assigned to each condition. Included in the instructions, participants found specific recommendations on carefully reading the description of the product before they proceeded to answer a questionnaire. Once they read the description of the product (the experimental task) at hand, they proceeded to answer the questionnaire items previously mentioned, which included items for perceived customization, perceived ease of use, perceived usefulness, technology readiness, customization sensitivity, and attitudes toward the product and its usage.

In the next section the variables in the proposed model as well as their operational definitions will be discussed. The measures of those variables will also be discussed in detail. Finally, the statistical tests that were performed to test the model will be presented.

Measures

The operational definitions of the constructs of interest as well as the instruments to measure them are described in this section. In many instances, scales or modified scales that have already been developed and validated in the literature were utilized. As stated previously, two measures for perceived customization and customization sensitivity were developed in this study because of the lack of such instruments in the literature. A summary of all measures is available in Appendix E.

Intention to Use CCHT Products

Individuals' intentions to use a particular system or technology have been broadly utilized. The measurement instruments differ in their number of items from just one: "I presently intend to use the capability intranet regularly at work" (Clegg, 2001, p. 241); two: "Assuming I have access to the system, I intend to use it[, and] given that I have access to the system, I predict I would use it" (Venkatesh & Davis, 2000, p.201); to more than five (Hu, Chau, Liu Sheng, & Tam, 1999, p.112). The present study adapted validated items on intention to use from prior research (Clegg, 2001; Hu et al., 1999; Venkatesh & Davis, 2000). In particular, the items were reworded to accommodate the context of CCHT products. Using a seven-point Likert scale (strongly disagree-strongly agree), participants answered general questions about their intention to use CCHT products:

1. I presently intend to use CCHT products.
2. I intend to use CCHT products when they become available.
3. I intend NOT to use CCHT products routinely.
4. Whenever possible, I intend NOT to use CCHT products.
5. Assuming I have access to CCHT products, I intend to use them.
6. Given that I have access to CCHT products, I predict that I would use them.

Attitudes Toward Using CCHT Products

In classical theory of attitudes, there is a distinction between the attitude toward the object and attitude toward the behavior (Fishbein & Ajzen, 1975, p. 31). Attitude toward the object refers to a person's affective valuation of a specified object, while attitude toward the behavior refers to a person's evaluation of a particular behavior concerning the object. Adapting the general definition of attitude toward behavior, attitude toward using CCHT products is defined as *the degree of evaluative affect that an*

individual associates with using a CCHT product. Following Ajzen and Fishbein (1980) and Davis (1993), attitude toward using CCHT products was measured in this study with a five item standard seven-point semantic differential rating scale concerning the use of the products being: Good-Bad; Wise-Foolish; Favorable-Unfavorable; Beneficial-Harmful; Positive-Negative.

Perceived Ease of Use

Davis (1989) defined perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort” (p. 320). He claimed that effort is a scarce resource and a person can allocate it to different activities. He developed and validated a 6-item scale to measure perceived ease of use. Later on he added four more items to this scale (Davis, 1993). In this study, the latest version of the scale Davis developed was utilized. Again using a seven-point Likert scale (strongly disagree-strongly agree), subjects were asked specific questions regarding the ease of using CCHT products.

1. I find CCHT products cumbersome to use.
2. In general, learning to operate CCHT products is easy for me.
3. Interacting with CCHT products is often frustrating.
4. I find it easy to get CCHT products to do what I want them to do.
5. CCHT products are rigid and inflexible to interact with.
6. It is easy for me to remember how to perform tasks using CCHT products.
7. Interacting with CCHT products requires a lot of mental effort.
8. My interaction with CCHT products is clear and understandable.
9. I find it takes a lot of effort to become skillful at using CCHT products.
10. Overall, I find CCHT products easy to use.

Perceived Usefulness

Perceived usefulness was defined by Davis (1989) as “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). Originally he developed and validated a six-item scale to measure perceived usefulness. As in the case of perceived ease of use he added four more items later on. Again, in this study, most of the items of the latest version were used with a seven-point Likert scale (strongly disagree-strongly agree):

1. Using CCHT products improves the quality of my life.
2. Using CCHT products gives me greater control in my home life.
3. CCHT products enable me to accomplish tasks more quickly.
4. Using CCHT products increases my productivity.
5. Using CCHT products improves my quality of life.
6. Using CCHT products allows me to accomplish more than would otherwise be possible.
7. Using CCHT products enhances my effectiveness.
8. Using CCHT products makes my life easier.
9. Overall, I find CCHT products useful.

Technology Readiness

Technology readiness is defined as “people’s propensity to embrace and use new technologies for accomplishing goals in home life and at work” Parasuraman (2000, p. 308). The construct refers to an “overall state of mind” (Parasuraman, 2000 p. 308) that ultimately indicates a person’s predisposition to use new technologies. In the present study, technology readiness adopts the same definition and conceptualization proposed by Parasuraman (2000). A modified shorter version with a five-point scale of the following items was utilized:

1. You find new technologies to be mentally stimulating.
2. If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place.

3. You like computer programs that allow you to tailor things to fit your own needs.
4. You do not consider it safe to do any kind of financial business online.
5. Other people come to you for advice on new technologies.
6. You worry that information you send over the Internet will be seen by other people.
7. You can usually figure out new high-tech products and services without help from others.
8. When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do.
9. In general, you are among the first in your circle of friends to acquire new technology when it appears.
10. It is embarrassing when you have trouble with a high-tech gadget while people are watching.

Customer Customization Sensitivity

As previously stated Customer Customization Sensitivity is defined as *the customer's preference for customized products/services*. To measure this construct this research uses the instrument that was developed in the first section of this chapter. Again, responses were on a seven-point scale anchored by “strongly disagree” to “strongly agree” of the following items:

1. In general, customized products/services meet my needs better than standard ones.
2. I wish there were more products/services that could be easily customized to my taste.
3. I believe there is a need for more customized products/services.
4. If the price is reasonable for standard and customized products/services, I would choose customized products/services.
5. If I can choose, I prefer to have customized products and services.

Perceived Customization

Perceived customization was defined as *the degree to which a person believes that a particular product/service or the features of that product/service are or can be*

customized to meet unique needs for individual consumers (including himself/herself) at no additional cost. The items developed in study one with a seven-point Likert scale were used for measurement of perceived customization:

1. This product is made to suit individual needs.
2. The product features are customized to satisfy each customer.
3. The services this product offers appear to be very customizable.
4. The features of this product make it a highly customized offering for customers.
5. This product could meet individual customers' needs very efficiently.
6. The technology in this product makes it very customizable to meet consumers' needs.
7. The features of this product make it very adaptable to many consumers' needs.

Method of Analysis

The proposed model (see Figure 2) consists of seven continuous variables. Baron and Kenny (1986) and Cohen and Cohen (1983) have shown the appropriateness of using regression analysis as the statistical procedure to examine the relationship between continuous dependent and independent variables, especially when dealing with moderator variables. Moreover, this method has been previously used in similar studies (Demi, Bakeman, Sowell, Moneyham, & Seals, 1998; Deshpande & Zaltman, 1982; Hershberger, 2003; Mehta, 1994; Peterson, Folkman, & Bakeman, 1996; Volkov, 1999). Primary analyses, then, utilized linear regressions to test the hypothesized relationships. The hypotheses stated in chapter two are:

- H₁: An individual's attitude toward using CCHT products is positively related with his/her intention to use them.
- H₂: When Perceived Ease of Use (PEOU) of the CCHT product is high (low), the attitude toward using the CCHT product will be positive (negative).

- H₃: When Perceived Usefulness (PU) of the CCHT is high (low), the attitude toward using the CCHT product will be positive (negative).
- H₄: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Ease of Use (PEOU) of that product will be low (high).
- H₅: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Usefulness (PU) of that product will be high (low).
- H₆: Technology Readiness moderates the relationship between PEOU and Perceived Customization/Customizability (PC). When Technology Readiness is high (low), PEOU will be high (low) for the perceived levels of PC of the CCHT.
- H₇: Customer Customization Sensitivity moderates the relationship between PU and PC. When Customization Sensitivity is high (low), PU will be high (low) for the perceived levels of PC of the CCHT.

To test these hypotheses the four equations representing the regression models are outlined next:

1. $IU_{CCHT} = a + b (A_{CCHT}) + \varepsilon$
2. $A_{CCHT} = c + d (PEOU) + e (PU) + \varepsilon$
3. $PEOU = f + g (PC) + h (TR \times PC) + \varepsilon$
4. $PU = i + j(PC) + k (CCS \times PC) + \varepsilon$

where:

ε = Error Term

IU_{CCHT} = Intention to Use CCHT products

A_{CCHT} = Attitude toward Using CCHT products

PEOU = Perceived Ease of Use

PU = Perceived Usefulness

TR = Technology Readiness

CCS = Customer Customization Sensitivity

PC = Perceived Customization/Customizability of CCHT product

For each hypothesis there is a regression coefficient that must be significant in order to accept that hypothesis. Table 6 shows the regression coefficients that needed to be significant and that correspond to each hypothesis.

Table 6.
Regression Results Needed for Hypothesis Support

Hypothesis	Regression Coefficient	Expected Finding	Direction
H1	b	Significant - Positive	Positive
H2	c	Significant - Positive	Positive
H3	e	Significant - Positive	Positive
H4	g	Significant - Negative	Negative
H5	j	Significant - Positive	Positive
H6	h	Significant - Positive	Positive
H7	k	Significant - Positive	Positive

Summary

This chapter has described the research design as well as the methodology that was used in the present investigation to test the proposed model. The research design explained how three studies were performed for this research. Studies one and two constitute the required foundation for the third main study. Study one consisted of the development of scales for perceived customization and customer customization sensitivity. The steps followed to develop these two scales were described in detail in this chapter.

Study two described the development and pretest of the scenarios that were used in the main study. This included selecting a particular product to develop the scenarios as

well as a test to check if the manipulations were perceived as intended for the high and low conditions. Moreover, after an initial pretest and several comments from participants, a second pretest to purify the scenario was performed. This second pretest included measures of familiarity and realism of the product to ensure that the scenarios do not violate realism and are familiar to respondents. As expected, results from the second pretest confirmed that the scenarios were acceptable for use in the third study.

The required procedures to perform study three were also discussed in this chapter. These included how the surveys would be administered and how the data would be collected. A review of the measures for the proposed model was introduced. Finally, the method of analysis that would be performed on the data collected for the main study was discussed.

CHAPTER IV

DATA COLLECTION AND ANALYSIS

In chapter three, a detailed description of the pretest performed as well as the development of scales was introduced. Those corresponded to studies one and two of this research. This chapter presents the data collection procedures and analyses performed for the main study. The purpose of the main study was to examine the role of perceived customization, technology readiness, customer customization sensitivity, perceived ease of use, and perceived usefulness of CCHT products in consumers' attitudes toward using CCHT products. The first section of this chapter explains the data collection and examines the sample used in the main study. In the second part, the procedures and analysis performed to test the hypotheses are presented. The third section summarizes the analysis and findings from the main study.

Data Collection and Sample Characteristics

Data for the main study used a sample of students from a university located in the urban area of a large Southern city of the United States as subjects. Several considerations need to be mentioned to better explain the use of student subjects in this research. First, many researchers have used them as valid surrogates for adults in empirical research (Mohr, Eroglu, & Ellen, 1998; Sweeney & Soutar, 2001; Yoo & Donthu, 2001). In fact, face validity tells us that students are consumers without any bias attached to them for just being students. Second, to validate the first argument, the selected university has a high percentage of students who are working, middle-age professionals (the average age for a student in that university is 25-30 years old) that can

mirror very closely any average consumer in a particular category. Finally, for the purposes of this study, knowing that the product selected to describe the scenarios in the surveys is a cell phone, a population that was familiar with cell phones was a necessary requirement. Students of all ages, particularly in their late teens and early twenties, are heavy users of high-tech gadgets and particularly cell phones and similar items (according to a 2004 report by Schadler, Kolko, Strohm and Baxter the mobile penetration by age is around 70% or higher for those in the age group of 25-29). Moreover, evidence indicates that students are highly familiar with cell phone usage. Several studies have shown the growing rate of cell phone use among university students (e.g., Cahners In-Stat Group 2000; www.instat.com). In this research, it is assumed that if students are familiar with cell phones they will be better able to judge whether a particular cell phone will be low or high customizable. Therefore, the use of students in that age range becomes an ideally convenient sample for this particular study.

In total, 280 surveys were distributed at different times and at different campus locations in a period of three months. The surveys were distributed alternating the high and low conditions of high and low cell phone scenarios. The respondents were instructed on how to proceed with the survey that was structured with the first part describing the cell phone and its characteristics and the second part presenting questions regarding the research model. The last part of the survey dealt with demographics and personal information. The scale reliabilities of all the constructs used in the survey are reported in Appendix F.

Although the surveys were distributed by the researcher and instructions were given on how to answer the questionnaires, few returned surveys (10) were unusable due

to missing answers or obviously impossible answers (i.e., all 5's in 5 questions in a row). A total of 270 surveys was considered usable for the main analysis. This number represents an accepted criteria in multivariate analysis (Hair, Anderson, Tatham, & Black, 1998) for appropriateness of analysis and generalizability of results. Out of the 270 questionnaires, 133 correspond to the high cell phone condition and 137 to the low cell phone condition.

The sample consisted of 60% women and 38% men (2% missing values of subjects who did not identify themselves in any category). The majority of respondents (75%) are in their early twenties, with more than 90% of subjects being between 18 and 44 years old. The ethnic composition of the sample is relatively mixed with about 40% white, 28% black, almost 20% Asian or Pacific Islander, and 5% Hispanics. Ten subjects (3%) indicated their belonging to other ethnicities or subgroups from European to South African. Household income levels tended toward \$60,000 or less (approximately 70%) and the educational background indicated that most of the subjects had 1 to 3 years of college (65%), which is consistent with the use of students at different levels of obtaining their degrees. For a detailed summary of the demographic characteristics of the sample, see Table 7.

Table 7.
Sample Demographic Characteristics

N = 270		Frequency	Percent
Gender			
	Male	102	37.8
	Female	162	60
Age			
	Less than 18	1	0.4
	18-24	204	75.6
	25-34	46	17
	35-44	17	6.3
	45-54	1	0.4
Household Income			
	Less \$20,000	79	29.3
	\$20-\$39.9 k	65	24.1
	\$40-\$59.9 k	39	14.4
	\$60-\$79.9 k	27	10
	\$80-\$99.9 k	22	8.1
	\$100 k +	27	10
Education			
	High School or Less	2	0.7
	1-3 Years of College	176	65.2
	4 Years of College	70	25.9
	Over 4 Years of College	20	7.4
Family Status			
	Single	218	80.7
	Married	42	15.6
	Divorced	6	2.2
	Other	2	0.7
Job			
	Employed Full-time	60	22.2
	Employed Part-time	141	52.2
	Not Employed	65	24.1
Ethnicity			
	Black	77	28.5
	Asian	53	19.6
	White (not Hispanic)	112	41.5
	Hispanic	14	5.2
	Native American	1	0.4
	Other	10	3.7

Data Analysis and Hypotheses Testing

Prior to testing the proposed model, an independent-samples t-test was conducted to compare the perceived customization scores for the low and high cell phone conditions. Results of this test indicated that there was a significant difference for the high and low conditions ($M_{\text{high}} = 4.99$, $SD = 0.99$; $M_{\text{low}} = 2.55$, $SD = 1.19$, $t\text{-value} = 18.190$, $p < .001$). The magnitude of the differences in the means was of a good size ($\eta^2 = 0.55$) confirming the manipulation checks performed in study two.

The proposed model (Figure 2) was tested using linear regression analysis following the research plan outlined in chapter three. This plan includes four regression analyses to test the seven hypotheses of the empirical model. The means and standard deviations for all the constructs used in the regression analyses, for the high and low conditions, are given in Table 8. The explanation of the regression analyses follow the table.

Table 8.
Means and Standard Deviations for Constructs

High Cell Condition (N=133)			Low Cell Condition (N=137)		
	Mean	Standard Deviation		Mean	Standard Deviation
Int to Use	5.31	1.23	Int to Use	3.3	1.34
Att	5.18	0.97	Att	3.75	1.23
PEOU	5.27	0.87	PEOU	4.96	0.89
PU	3.96	1.18	PU	3.11	1.22
PC	4.99	0.99	PC	2.55	1.19
TR	3.42	0.54	TR	3.46	0.55
CCS	5.5	1.03	CCS	5.65	1.06

Note. Means are on a 7-point scale (1=Strongly Disagree, 7=Strongly Agree) for all the constructs except for TR that are on a 5-point scale (1=Strongly Disagree, 5=Strongly Agree) and Att, that are measured on a 7-point semantic differential rating scale (the higher the number, the more positive the attitude).

Regressions 1 and 2

The first regression analyses test for hypotheses one, two, and three are replication hypotheses of Davis's Technology Acceptance Model in the context of CCHT products. These hypotheses state that:

- H₁: An individual's attitude toward using CCHT products is positively related with his/her intention to use them.
- H₂: When Perceived Ease of Use (PEOU) of the CCHT product is high (low), the attitude toward using the CCHT product will be positive (negative).
- H₃: When Perceived Usefulness (PU) of the CCHT is high (low), the attitude toward using the CCHT product will be positive (negative).

These hypotheses were tested via the following regression models:

$$IU_{CCHT} = a + b (A_{CCHT}) + \varepsilon$$

$$A_{CCHT} = c + d (PEOU) + e (PU) + \varepsilon$$

Prior to testing the hypotheses, the variables were examined to ensure that the assumptions of regression analyses were met. A multicollinearity test revealed that perceived ease of use and perceived usefulness were significantly correlated at a very low level (Pearson correlation was 0.20 with a shared variance of 4%, $p < .05$). Moreover, when partial correlations were calculated controlling for the influence of attitudes, the value of the Pearson correlation dropped to .039 with $p = .515$. This test revealed that there was not a significant collinearity between perceived ease of use and perceived usefulness.

Table 9 shows the outcome of the regression analysis for hypothesis. The results confirm previous findings of the relationship between attitudes and intentions (H₁: $t = 17.63$, $p < .001$) where positive attitudes will tend to support greater intentions to use the products. Total variance explained by the model was $\text{adj}R^2 = .53$.

Table 9.
Multiple Regression Analysis of the Effect of Attitudes on Intention to Use CCHT Products (n = 270)

Predictor Variables	Unstandardized Coefficients (Beta)	Standardized Coefficients (Beta)	t	Sig
(Constant)			1.042	.298
Attitude (Att)	.906	.733	17.631	.000

Dependent Variable: Intention to Use CCHT products (Int)

Model Summary^a

R	.733
R ²	.537
AdjustedR ²	.535
Std. Error of the Estimate	1.114
F	310.868 ^b

^a Predictors: (Constant), ATT

^b p<.001

Also, hypotheses two and three were supported with the regression analysis (see Table 10). The adjR² of the model was .37. In this case, it was confirmed that higher levels of perceived ease of use and usefulness will lead to more positive attitudes toward CCHT products (H2: t = 3.579, p< .001 and H3: t = 11.299, p< .001).

Table 10.
Multiple Regression Analysis of the Effect of Perceived Ease of Use and Perceived Usefulness on Attitudes Toward CCHT Products (n = 270)

Predictor Variables	Unstandardized Coefficients (Beta)	Standardized Coefficients (Beta)	t	Sig
(Constant)			2.851	.005
Perceived Ease of Use (PEOU)	.260	.176	3.579	.000
Perceived Usefulness (PU)	.576	.556	11.299	.000

Dependent Variable: Attitude toward CCHT products (Att)

Model Summary

R	.616
R ²	.379
AdjustedR ²	.374
Std. Error of the Estimate	1.045
F	81.527 ^b

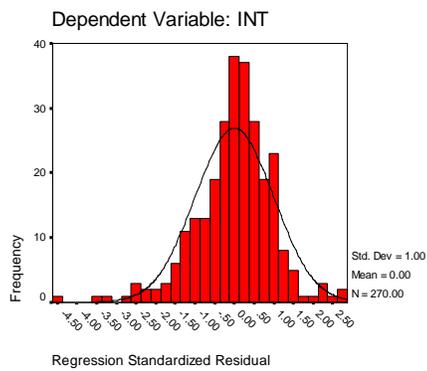
^a Predictors: (Constant), PEOU, PU

^b p<.001

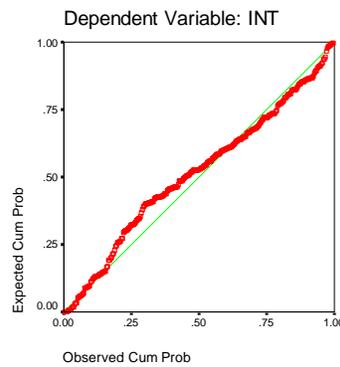
Residual analysis for possible violations of the regression model does not reveal any significant abnormalities. The residuals showed no pattern of nonlinearity and the frequency distribution appears sufficiently close to normal (see Figures 3 and 4).

Figure 3. *Analysis of Standardized Residuals in Regression 1*

Frequency distribution of standardized residuals



Normal plot of the standardized residuals



Scatterplot of standardized regression residuals

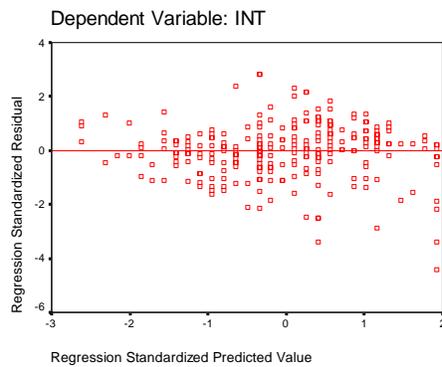
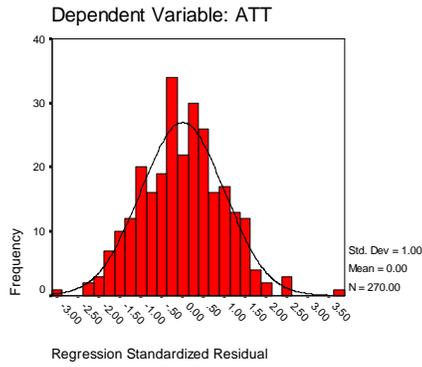
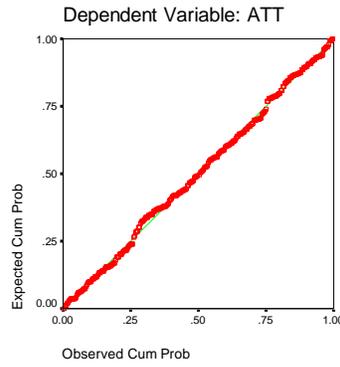


Figure 4. *Analysis of Standardized Residuals in Regression 2*

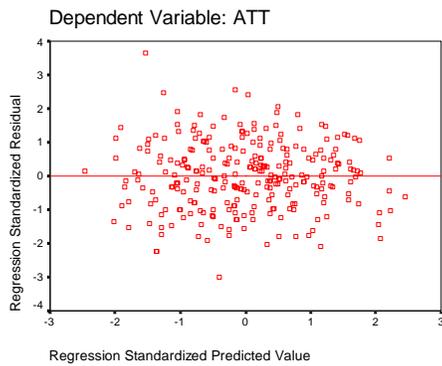
Frequency distribution of standardized residuals



Normal plot of the standardized residuals



Scatterplot of standardized regression residuals



Regression 3

The third regression analysis tests for hypotheses four and six and represents part of the unique contribution of the present research. In particular it refers to the influence of perceived customization and technology readiness on perceived ease of use. It was hypothesized that:

H₄: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Ease of Use (PEOU) of that product will be low (high).

H₆: Technology Readiness moderates the relationship between PEOU and Perceived Customization/Customizability (PC). When Technology Readiness is high (low), PEOU will be high (low) for the perceived levels of PC of the CCHT.

Again, these hypotheses were tested via the following regression model:

$$\text{PEOU} = f + g (\text{PC}) + h (\text{TR} \times \text{PC}) + \varepsilon$$

In the results of the regression analysis, the *t*-test for the coefficients “g” and “h” are interpretable as indicative of the perceived customization and technology readiness x perceived customization relationships to perceived ease of use. In order for the hypotheses to be confirmed, “g” and “h” (or the beta estimates in the equation) need to be negatively and positively significant respectively. Results for the regression analysis are shown in Table 11. As seen in the table, there is support for H₄ (*t* = -3.6, *p* < .001) and H₆ (*t* = 4.90, *p* < .001), indicating that technology readiness moderates the relationship between perceived customization and perceived ease of use.

Table 11.
Multiple Regression Analysis of the Effect of Perceived Customization on Perceived Ease of Use and the Moderator Role of Technology Readiness (n = 270)

Predictor Variables	Unstandardized Coefficients (Beta)	Standardized Coefficients (Beta)	t	Sig
(Constant)			36.769	.000
Perceived Customization (PC)	-.277	-.551	-3.602	.000
TR x PC	.110	.750	4.907	.000

Dependent Variable: Perceived Ease of Use (PEOU)

Model Summary

R	.319
R²	.102
AdjustedR²	.095
Std. Error of the Estimate	.85273
F	15.095

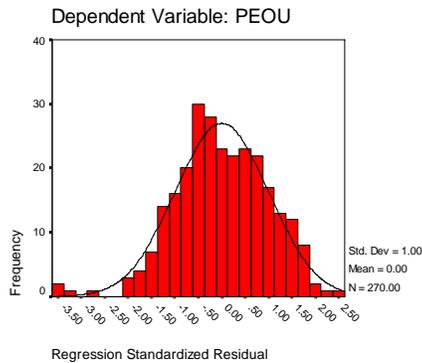
^a Predictors: (Constant), PC, TRxPC

^b p<.001

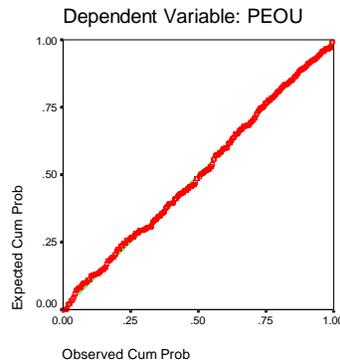
Prior to testing the hypotheses, the variables were examined to ensure that the assumptions of regression analyses were met. A multicollinearity test revealed that technology readiness and perceived customization were significantly correlated at a very low level (Pearson correlation was -.16 with a shared variance of 3%). This test also showed that there was not a significant collinearity between perceived ease of use and perceived usefulness. Moreover, Figure 5 also showed no significant violations of the regression model.

Figure 5. *Analysis of Standardized Residuals in Regression 3*

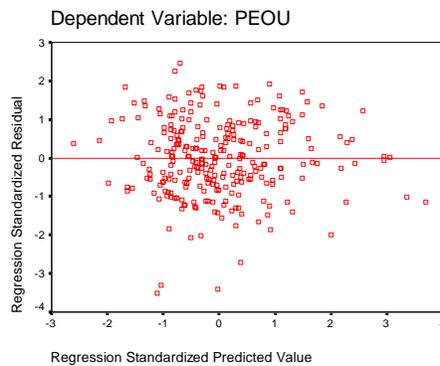
Frequency distribution of standardized residuals



Normal plot of the standardized residuals



Scatterplot of standardized regression residuals



Regression 4

Regression four tests for hypotheses five and seven and answers the question of how much and in which way perceived customization and customization sensitivity affect perceived usefulness. These questions were expressed through the following hypotheses:

- H₅: When the Perceived Customization/Customizability (PC) of a HT product is high (low), the Perceived Usefulness (PU) of that product will be high (low).
- H₇: Customer Customization Sensitivity moderates the relationship between PU and PC. When Customization Sensitivity is high (low), PU will be high (low) for the perceived levels of PC of the CCHT.

These hypotheses were tested using the following regression model:

$$PU = i + j(PC) + k (CCS \times PC) + \varepsilon$$

Once again, in the results of the regression analysis, the *t*-test for the coefficients “j” and “k” indicate support for the hypotheses. Table 12 presents the results of the analyses.

Table 12.

Multiple Regression Analysis of the Effect of Perceived Customization on Perceived Usefulness and the Moderator Role of Customer Customization Sensitivity (n = 270)

Predictor Variables	Unstandardized Coefficients (Beta)	Standardized Coefficients (Beta)	t	Sig
(Constant)			12.808	.000
Perceived Customization (PC)	.282	.364	2.703	.007
CCS x PC	.012	.095	.709	.479

Dependent Variable: Perceived Usefulness (PU)

Model Summary

R	.452
R²	.205
AdjustedR²	.199
Std. Error of the Estimate	1.1443
F	34.354

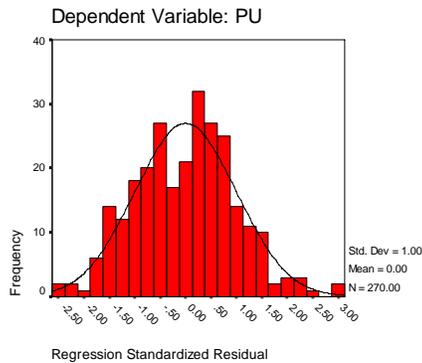
^a Predictors: (Constant), PC, CCSxPC

^b p<.001

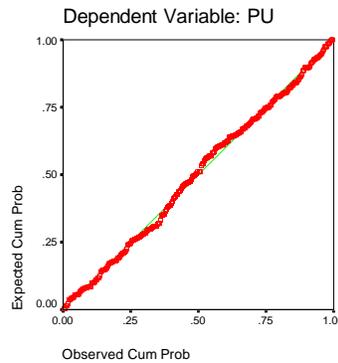
Residual analysis for violations of the regression model again did not reveal any critical abnormalities. Frequency distribution of the residuals appears sufficiently close to normal, and the normal plots and scatter plots do not suggest any patterns that would indicate problems with non-normality of the error terms, inequality of variances, or autocorrelation of residuals (see Figure 6).

Figure 6. *Analysis of Standardized Residuals in Regression 4*

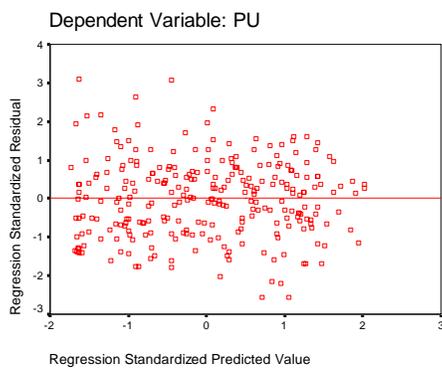
Frequency distribution of standardized residuals



Normal plot of the standardized residuals



Scatterplot of standardized regression residuals



As seen from Table 11, the analysis indicates that perceived customization was a significant predictor of perceived usefulness ($t = 2.7, p < .007$), and therefore H5 is supported. However, it appears that customer customization sensitivity does not moderate the relationship between perceived customization and perceived usefulness as hypothesized ($t = .70, p = .479$), and therefore, there was no support for H7.

One of the objectives of this research was to explore the role that customer customization sensitivity plays on consumers' perception of usefulness of CCHT products. The lack of support for the proposed hypothesis could derive from different

reasons. From a conceptual standpoint, when measuring a new construct, there is always the possibility of either measuring something else, or not capturing the real essence of the construct itself. Although all possible care was taken to avoid these problems, defining customization sensitivity differently and therefore measuring it differently could have produced different results. For instance, an alternative definition could have been based on “need for customization” in a similar way to the concept of need for cognition broadly used in the consumer behavior literature (Cacioppo & Petty, 1982; Kaufman & Stasson, 1999; Wood & Swait, 2002; Zhang & Buda, 1999).

Another reason that could explain why H7 was not supported could refer to the relatively homogeneous composition of the sample of this study with regards to the customization sensitivity construct. For the two groups that represented the high and low cell conditions the means for customization sensitivity were very close and not significantly different ($M_{\text{high}} = 5.50$, $SD = 1.03$; $M_{\text{low}} = 5.65$, $SD = 1.06$, $t\text{-value} = -1.15$, $p = .25$). This skewed sample for customization sensitivity could have played an important role in the obtained results.

A last reason for the lack of support suggests that future research is needed with an alternative explanation for the relationship between customization sensitivity, perceived customization, and perceived usefulness. As a starting point, a new possible relationship was tested where customer customization sensitivity is the antecedent of perceived usefulness and perceived customization acts as a moderator of the relationship between perceived usefulness and customization sensitivity. The rationale behind this relationship rests on the idea that people who are sensitive to customized products will

find a given product useful, especially if it is very customizable. Results for the analysis of exploring this alternative are shown in Table 13.

Table 13.
Multiple Regression Analysis of the Effect of Customer Customization Sensitivity on Perceived Usefulness and the Moderator Role of Perceived Customization (n = 270)

Predictor Variables	Unstandardized Coefficients (Beta)	Standardized Coefficients (Beta)	t	Sig
(Constant)			9.187	.000
Customer Customization Sensitivity (CCS)	-.216	-.178	3.117	.002
CCS x PC	.062	.485	8.487	.000

Dependent Variable: Perceived Usefulness (PU)

Model Summary

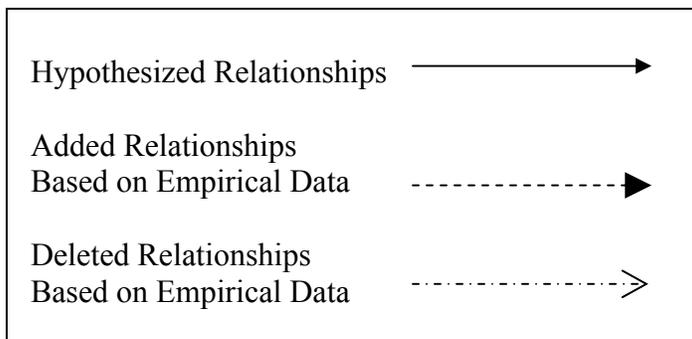
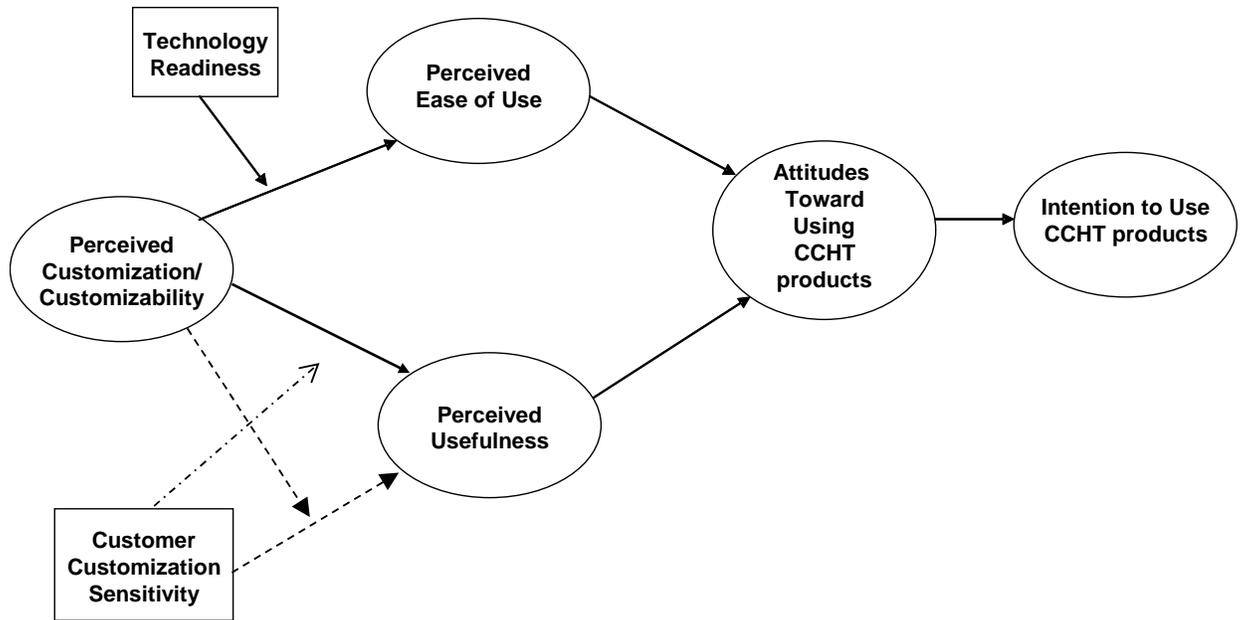
R	.462
R²	.213
AdjustedR²	.207
Std. Error of the Estimate	1.134
F	36.144

^a Predictors: (Constant), CCS, CCSxPC

^b p<.001

As seen from the table, there is support for perceived customization acting as a moderator of the relationship between customization sensitivity and perceived usefulness. Again, this preliminary result would require further research to be validated, but at this point, it helps to understand why H7 as originally proposed was not supported. The new revised possible model (see Figure 7) versus the original proposed model (see Figure 2) is shown next.

Figure 7. *Modified Model Based on Empirical Data*



Summary of Data Collection and Analysis

The data collection and analyses of this dissertation represent the carrying out of four separate studies that are summarized in Table 14.

Table 14.
Summary of Studies

Study #	Objective	Sample Size
1	Scale Development for PC and CCS	59
2	Development of Scenarios (original)	80
2a	Development of Scenarios (final)	84
3	Testing the Proposed Model	270

The data analyses detailed in this chapter provide support for six out of the seven hypotheses (see Table 14) proposed with Figure 2. As expected, the replication hypotheses of Davis's model found strong support in this study. Intention to use CCHT products is positively related to the attitudes toward the CCHT products. Also, the attitudes toward CCHT products depend on how easy to use and how useful those products are perceived to be in the eyes of the consumer.

Table 15.
Summary of Hypothesis Testing Results

Hypothesis	Regression Coefficient	Expected Finding & Direction	Results
H1	b	Significant - Positive	As Expected
H2	c	Significant - Positive	As Expected
H3	e	Significant - Positive	As Expected
H4	g	Significant - Negative	As Expected
H5	j	Significant - Positive	As Expected
H6	h	Significant - Positive	As Expected
H7	k	Significant - Positive	Not Significant

In addition, with this research, the importance of the perception of customizability for a CCHT product is supported by the significant results for H4 and H5. In particular, these hypotheses tell us that in order to analyze consumers' attitudes toward CCHT products, it is important to understand the perception of customization/customizability of those products and its impact on the perception of usefulness and ease of use. In other words, consumers will perceive high-tech products as being more or less customizable depending on the product's features and characteristics as well as the intrinsic personal abilities (based on previous experience and knowledge) of the individual. This study confirms that this perception is important in order for consumers to understand the relationship of individuals with CCHT products.

The analyses also found support for the importance of the moderating effect of technology readiness on the relationship between perceived customization and perceived ease of use. When technology readiness is high, the influence of perceived customization on perceived ease of use is higher, and when technology readiness is low, the influence of perceived customization on perceived ease of use is lower. Therefore, perceived customization was found to have a greater effect on perceived ease of use when individuals are more oriented toward technology (as measured by technology readiness).

Finally, the effect of customer customization sensitivity on perceived usefulness was not supported as hypothesized. The influence of perceived customization on perceived usefulness does not change depending on customer customization sensitivity according to the analyses performed. However, from additional exploratory analysis it was found that sensitivity toward customized products might have a different kind of impact on the perceived usefulness of the CCHT products. In particular, it was found that

customer customization sensitivity could indeed be an antecedent of perceived usefulness. Further research, beyond the scope of this study, would be required to confirm this preliminary result.

In the next chapter, a discussion of the results as well as the contributions and limitations of this study and its findings will be discussed. Also, some specific directions for future research will be introduced.

CHAPTER V

DISCUSSION, CONTRIBUTIONS, AND LIMITATIONS

This chapter summarizes the findings of the study as well as outlines its contributions and limitations. First, a discussion of the findings is introduced, followed by theoretical and managerial contributions of the study with several indications of future research related to these contributions. Finally, the limitations are also stated.

Discussion

This study aimed to investigate the attitudes of consumers toward CCHT products and their intention to use those products. Borrowing from Davis's (1986) TAM model as well as from long established attitude theory (Allport, 1935; Fishbein & Ajzen, 1975; Staw & Ross, 1985; Eagly & Chaiken, 1993) a conceptual model was developed to examine consumers' attitudes toward customizable products in the context of high-tech products. The analyses confirmed the critical importance of the variables of the study explaining consumers' attitudes toward using CCHT products. Next, a discussion of the individual hypotheses and the results followed by the contributions and limitations of the study are introduced.

Hypothesis 1: Attitudes Toward Using CCHT Products and Intentions to Use CCHT Products.

The data confirmed previous findings of the relationship between attitudes and intentions. As expected, the more positive the attitude toward using the CCHT product, the higher the intention to use the product. This result is consistent with those obtained in

different settings in the IS field (Davis, 1986; Adams, Nelson & Todd, 1992; Subramanian, 1994).

Hypothesis 2: Relationship Between Perceived Ease of Use and Attitude Toward Using the CCHT Product.

As expected from previous research, if a product is perceived as very easy to use, a more positive attitude toward using that product is developed. This is a logical finding that indicates that regardless of the intrinsic characteristics and features of a high-tech product, it is the perception of how easy to use the product is in the mind of the consumer that will have a critical impact in the attitude toward using the product. If an individual perceives a product as difficult to use, chances are that she will not be interested in using it. This simple fact has a powerful implication in the design and marketing of high-tech products in general and customizable high-tech products in particular. Consumers need to believe that the product will be easy to use in order for them to develop an interest in using it.

Hypothesis 3: Relationship Between Perceived Usefulness and Attitude Toward Using the CCHT Product.

Again the results of the present study confirmed previous findings on the importance of perceived usefulness and attitudes toward using a product. In particular, the attitude will be more positive as the usefulness of the product grows in the mind of the consumer. This finding confirms the importance of the design of the features that would be thought as more useful for the consumers in the context of customizable high-tech products.

Hypothesis 4: How the Perceived Customizability of a High-Tech Product Affects the Perceived Ease of Use of that Product.

In this study it was hypothesized that if a high-tech product is perceived as being very customizable, it may not be perceived as easy to use due to other aspects such as the required learning for the customization to occur or simply the required time or effort to become used to the product. This hypothesis was confirmed with the analysis. This study did not inquire on the reasons why more customization capabilities seem to have an impact on the perception of how easy to use a product is; however, as stated earlier, several potential logical reasons could play a role in this outcome. Further research could bring more light into this aspect.

Hypothesis 5: How the Perceived Customizability of a High-Tech Product Affects the Perceived Usefulness of that Product.

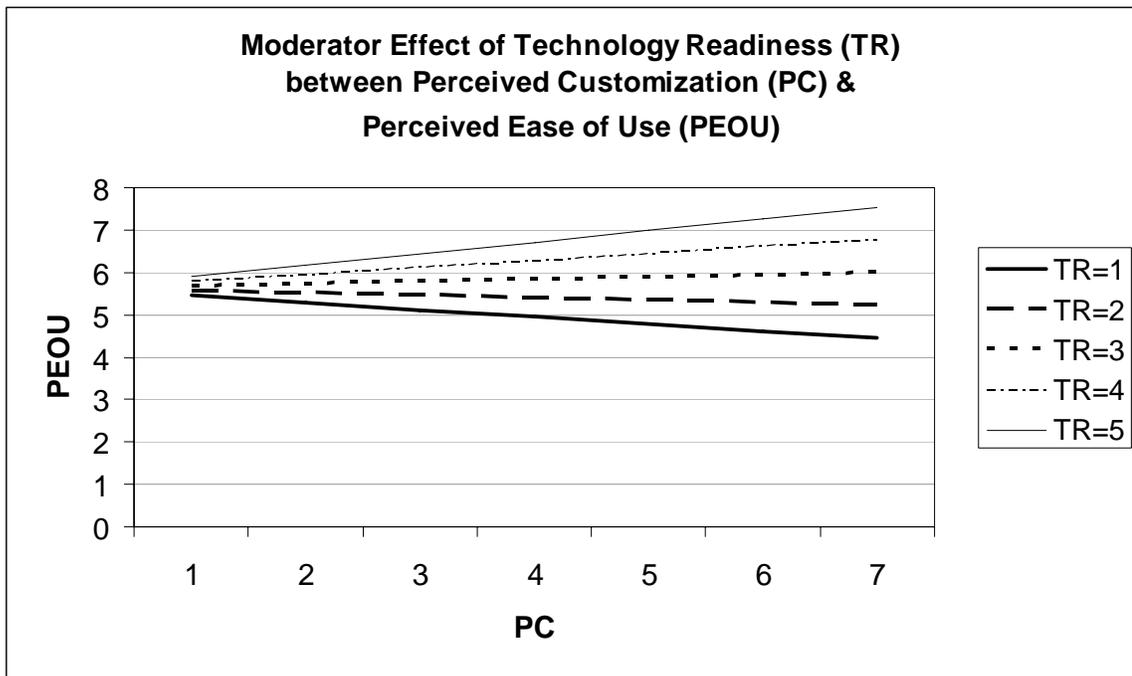
In a similar way to hypothesis four, it was postulated that if a high-tech product is perceived as being very customizable, it would also be perceived as very useful. The rationale behind this hypothesis is that consumers would associate more customization with potentially more usefulness regardless of how easy that customization would be to achieve. In other words, the mind of the consumer would say something like *this product has to be really useful with so many customization capabilities—for those who know how to do it*. This research also confirmed this hypothesis. The result indicates that it could be some kind of mediation effect between the perception of usefulness of a customizable product and the intention to use it depending on the ability to perform the customization itself. If a consumer believes in her abilities to perform the customization it would seem

that the intention to use the product would be more plausible. This aspect was beyond the scope of this study and could be investigated with further research.

Hypothesis 6: The Moderating Role of Technology Readiness Between Perceived Ease of Use and Perceived Customization.

Results from the analysis found support for the hypothesis that technology readiness moderates the relationship between perceived ease of use and perceived customization. This result confirms that the relationship between perceived customization and perceived ease of use is affected by higher or lower levels of technology readiness. In hypothesis four, it was hypothesized that perceived customization has a negative impact on perceived ease of use. According to the results for hypothesis six, this impact is moderated by how technology ready the subject believes she is. If a customer thinks of herself as being very technology ready (or technology inclined), it is possible that the customizable features will not have such a great impact on the ease of use of the product because she would think that she is capable of dealing with those features. Figure 8 depicts the graphical representation of the moderator effect of technology readiness between perceived customization and perceived ease of use.

Figure 8. Moderator Effect of Technology Readiness (H6)



Further research could investigate the role of technology readiness as an antecedent of perceived ease of use or even as a critical factor determining attitudes toward using high-tech products.

Hypothesis 7: The Moderating Role of Customer Customization Sensitivity Between Perceived Usefulness and Perceived Customization.

One of the purposes of this study was to develop a scale to measure customer customization sensitivity in order to investigate the moderating role of this construct between perceived customization and perceived usefulness (hypothesis seven). It was hypothesized that the positive effect of perceived customization on perceived usefulness would be greater for higher sensitivity levels toward customization and vice versa. The

rationale behind this hypothesis was the idea that higher sensitivity toward customized products would indicate an inclination toward preferring more customizable products when given the option. Therefore, if a product was perceived as highly customizable and the consumer was very inclined toward customized offerings, she would think of the product as being more useful. Results from the analysis in this study found that relationship insignificant.

The lack of support for hypothesis seven tells us that customer customization sensitivity does not relate to perceived customizability and perceived usefulness as it was expected. Several explanations were provided as plausible reasons for the lack of support. One referred to the how the construct of customization sensitivity was defined. Another referred to the lack of variance in the sample with regards to customization sensitivity. A last explanation suggested other possible relationships of customization sensitivity with the other constructs used in this study for further research. As a starting point, a new relationship was tested and supported. This new exploratory relationship posits customization sensitivity as an antecedent of perceived usefulness having perceived customization acting as a moderator. This new relationship has some face validity. It tells us that if a consumer is very sensitive toward customized products she will find a given product useful, especially if it is very customizable. Again, further research could help bring a better understanding of the role of customer customization sensitivity and consumers' attitudes toward using CCHT products.

Theoretical Contributions of the Study

There are several theoretical and managerial contributions that can be drawn from this study. From a theoretical standpoint, a first contribution relates to the expansion of the literature on mass customization to include the consumer point of view. Although mass customization has been widely researched in the management and manufacturing literature, relatively little research has been produced that examines consumer behavior toward customized products. This research is one of the first attempts to study consumers' attitudes and their antecedents toward CCHT products. As such, the results of this analysis represent a valuable step in better understanding several critical factors that affect how consumers relate toward CCHT products.

A second theoretical contribution of this study refers to deepening the current understanding of high-technology marketing. As mentioned in the literature review section of this research, Mohr (2001) states that "marketing high-technology products and innovations is not the same as marketing more traditional products and services" (p. xi). She explains that due to their particular nature, high-tech products are not familiar to consumers and provoke fear, uncertainty, and doubt regarding usage. Moreover, technological breakthroughs, which can change products quite rapidly, make potential consumers even more skeptical. This results in what is known as "leapfrogging" (Mohr, 2001, p. 164) or passing on purchasing a current technology in anticipation of a new, better innovation coming in the near future. Due to the special nature of these types of products, Mohr's conclusion is that there is a need to develop special marketing practices and theories that should be applied to high-technology products. The current study

follows that need and contributes to explain the marketing of high-tech products with the final consumer in mind.

Another contribution of this study is the development of a perceived customization scale. Previous research has focused on customization per se, but to date there is no well-accepted measurement of perceived customization even in the consumer behavior field. In this study it is argued that the perception of customization or customizability is a critical point for consumers embracing customized products/services. Perception has been defined as a “process by which an individual is exposed to information, attends to that information and comprehends it” (Mowen & Minor, 1998, p. 63) or more extensively, how an individual “selects, organizes, and interprets information inputs to create a meaningful picture of the world” (Berelson & Steiner, 1964, p. 88). This approach to understanding perception relates to the emphasis placed by the present study on consumers and “how they see the world” (Schiffman & Kanuk, 2000, p. 122). Therefore, the present research has aimed to develop a perceived customization/customizability measure that can be used to assess customers’ perceptions of customized products. This scale could also be used to measure the customizability of any kind of product in different settings in future research.

A fourth contribution of the present study is the development of a *sensitivity* scale of customization for consumers. Hart (1995) invented the construct of customer customization sensitivity, but to date there is no instrument to measure that sensitivity. Using Hart’s (1995) conceptualization of customization sensitivity, this research develops a measure that can benefit scholars and practitioners likewise. The development of this measure can help to answer two questions: (1) how much consumers care for customized

offerings and (2) which customized products or services consumers want most. This measure represents the first step toward answering these questions. Moreover, developing this measure has important practical and theoretical implications that benefit mass-customization research in several ways. First, the measure can be used to examine how consumers feel about a customizable product and assess if, before a customization strategy takes place, potential consumers will be pleased with it or confused by it (Huffman & Kahn, 1998; Teresko, 1994). Second, the measure could be easily modified and used to assess customization sensitivity toward specific products/services. Also, antecedents of customization sensitivity such as consumption experience, environmental factors, demographics, or brand image could be investigated using this measure. In a similar way, the consequences of customization sensitivity may be studied using the measure. Finally, this scale could be used to measure consumers' differences in sensitivity toward customization such as cross-cultural or demographic differences.

An additional theoretical contribution of this research is the extension of the TAM model into the new context of customized products. Building upon existing literature to explain attitudes and behavior toward using CCHT products, this study confirms that CCHT products have to be perceived as useful and easy to use for people to have positive attitudes toward using them and therefore be willing to use them.

A last theoretical contribution of this investigation refers to introducing the constructs of customization sensitivity and technology readiness in explaining consumers' attitudes toward CCHT products. In particular, this study examined the moderating role of customization sensitivity (Hart, 1995) and technology readiness (Parasuraman, 2000) as critical elements that help to explain consumer attitudes toward

using CCHT products. From the analysis it seems that both constructs have an important impact that could be further investigated in future research.

Managerial Contributions of the Study

From a managerial perspective, several contributions can also be derived from the present study. First, it is emphasized through the paper that customization strategies should not be implemented blindly. To become successful when developing customization strategies, managers and marketers need to be aware that there are specific issues to consider. This study focuses on analyzing consumer attitudes toward using CCHT products, indicating that customization strategies should start with the consumer in mind. Practitioners need to realize that, considering the consumer's perspective, some products are more appropriate for mass customization before they invest time and money developing these strategies. Moreover, there are ways (i.e., studying sensitivity toward customized products) to consider if a particular product or category of products may be appropriate for a customized offering. For successful implementation of mass-customization strategies, this research posits that managers need to account for consumer perceived ease of use and perceived usefulness of the product. For instance, if a high-tech product targeted to consumers is perceived to be difficult to use due to the perceived customizability, marketers need to decide whether to emphasize its usefulness rather than its customizability.

This study should help marketers of high-tech products interested in mass-customization to improve their segmentation strategies. This could be achieved by implementing segmentation techniques based on (a) the consumer need for

customization, (b) the product itself, (c) how technology ready or technology oriented the consumers are and/or (d) individual characteristics (such as demographics, cultural/social differences). The present research has started on this path with the focus on customization sensitivity, technology readiness and some important variables (perceived usefulness and perceived ease of use) for the marketing of high-tech products. Further research based on other variables (i.e., demographics, cultural/social differences, willingness to pay for CCHT products, perceived risk of using CCHT products, novelty-seeking, and attitudes toward CCHT products, etc.) should continue in this direction.

Study Limitations

This study aimed to bring insight into the marketing of mass-customized high-tech products. The research faces some limitations that could not be avoided in this study. However, future studies could address some of these concerns. First, one limitation mentioned earlier refers to the use of students who might not mirror the population as a whole. In spite of the reasons given to justify the use of students in this study, there is always a chance that different results could have been obtained with a sample of nonstudents. Therefore, future research including non student populations could help to deal with this generalizability problem.

Second, when conducting research, it is normally problematic to try to capture a whole category of products while still choosing particular examples of that category. In this study, it was necessary to select a product within the high technology category that would allow the development of scenarios. Although every possible effort was taken to develop realistic manipulation of scenarios, subjects may act differently in actual

situations when encountering high-technology products. This problem is intrinsic to research. There are always some risks when trying to emulate real-life situations in experimental research. However, this shortcoming might be overcome in future research by replication across other products or even other categories to obtain more robust results.

Another limitation of this research is the choice of the TAM model to explain attitudes toward CCHT products. Other tested theories can also help explain these attitudes. In this case, TAM was carefully selected because the constructs utilized in that model (perceived ease of use and perceived usefulness) seemed especially appropriate for the object of study. Future studies can stem from other theoretical directions to explain attitudes toward CCHT products.

There are issues with the results for hypothesis seven in the study. The lack of support for this hypothesis questions the proposed model and indicates the need for a better explanation of the relationship between customization sensitivity, perceived usefulness, and perceived customization. A preliminary exploratory analysis was performed to better understand this relationship. However, further research based on a new or different theoretical basis could enlighten this issue.

A last limitation of this study refers to the relatively low reliability coefficient for the construct of technology readiness ($\alpha = .68$). Although the result is very close to the generally agreed upon lower limit of .70 (Robinson, Shaver, & Wrightsman, 1991), several reasons might explain the low score obtained with this research. First, the technology readiness scale measures and classifies subjects based on their propensity to embrace technology. There are three versions of the scale that can be used with different

purposes following the recommendations of the authors: (a) a 36-item scale to be used when a study is primarily focused on technology readiness, (b) a 10-item scale for studies when technology readiness is just a variable for the analysis, and (c) a 6-item scale for basic measure of technology readiness where space on the questionnaire is of concern. Following these recommendations, it was decided that the 10-item scale would be the most appropriate choice for the present study. This choice might have had an impact on the final reliability of the scale.

Second, the original 36-item scale contains four subsets of items that constitute four dimensions of the index: optimism, innovativeness, discomfort and insecurity. When the scale was developed, the reliabilities for each dimension varied from .74 for insecurity to .81 for optimism (Parasuraman, 2000). Once the scale is reduced to 10 items, it is supposed to be an overall measure for technology readiness; however, the underlying four factors could act in a way that would affect the results of calculating a total reliability for the scale. Moreover, it is not very useful to calculate reliabilities for each independent factor when using the 10-item scale because each factor is composed of only two or three items. One issue when calculating Cronbach's alpha is the fact that the number of items of the scale has an important effect on the results (alpha is positive related to the number of items). Using the 36-item scale and calculating independent reliabilities for each underlying factor with future research would make a better comparison with the alphas obtained in the development of the measure.

Finally, although all possible care was taken when using this scale and all the recommendations for its use were followed, it is possible that the particular context of

this study could have affected the results. Future research in different contexts and with different products could help to verify if that is the case.

Appendix A
Survey for Pretest One

GEORGIA STATE UNIVERSITY MARKETING STUDY

We would like to request your voluntary participation in this short survey, the purpose of which is to test and refine a set of rating scales. In the future these scales will be used to measure consumers' perceptions of mass-customized products/services and consumers' susceptibility to customization. For testing purposes an example of a product and a particular context are given to facilitate the task. Our interest is not in your personal opinions about the products, but rather in the statistical properties of the rating scales themselves. Your responses will remain completely anonymous.

Thank you for your participation.

M. Guilabert*

How to use rating scales:

Today is a cloudy day.

Strongly							Strongly
Disagree			Neutral				Agree
1	2	3	4	5	6	7	

By circling 6, you would be saying that you agree quite a lot with the given statement.

* For questions about this research please contact Mrs. Guilabert at mktmbgx@langate.gsu.edu

PLEASE TURN THE PAGE

Imagine you received, as a gift, the following product:



Cell Phone with the following features:

- LCD Display
- Caller ID
- Built-in Speakerphone (predefined volume with no option to regulate)
- Selectable 3-Music Ringtones
- Number Directory with direct dialing for up to 30 numbers
- Answering System (2 individual Voicemail Boxes)
- Memo Recording
- Any Key Answer

The following statements are about your opinions on the particular product. Please circle the number that corresponds best to your answer.

1. This product is made to suit individual needs.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. This is not a “one size fits all” kind of product.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. The product features are customized to satisfy each customer.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. This product does not appear to be a mass-produced standard product.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. The features this product offers do not appear to be standard.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

6. The services this product offers appear to be very customizable.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

7. In my opinion this product is highly customized.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

8. The features of this product make it a highly customized offering for customers.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

9. This product could meet individual customers' needs very efficiently.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

10. This is a very standard product.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

11. The technology in this product makes it very customizable to meet consumers' needs

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

12. The features of this product make it very adaptable to many consumers' needs.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

Customization is an important issue for many marketers. The following statements are about your opinions on customization issues. Please circle the number that corresponds best to your answer.

1. In general, customized products/services meet my needs better than standard ones.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. I wish there were more products/services that could be easily customized to my taste.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. I believe there is a need for more customized products/services.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. Overall, I do not care for customized products/services.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. I only care for some products/services to be customized.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

6. If the price is similar for standard and customized products/services, I would choose customized products/services.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. If I can choose, I prefer to have customized products and services.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

8. I look for special features when buying high-tech products/services.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

9. Current high-tech products/services do not meet my needs.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

10. Lack of unique features in current high-tech products/services make them very inconvenient.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

11. Encountering difficulties when using high-tech products/services is the price you pay for “cut of the edge” technology.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

12. If I have to wait to get the latest version of a high-tech device, I'd go with the previous version instead.

Strongly								Strongly
Disagree	1	2	3	4	5	6	7	Agree

Appendix B

Original and Final Cell Phone Scenarios

Original Cell Phone Scenarios

Cell Phone – High Condition

Imagine you received, as a gift, the following product:

Cell Phone with the following features:

- LCD Screen with the color of your choice (for the Font and Background)
- Caller ID which lets you select what to store: name, number, time, and date
- Built-in Speakerphone (volume settled by customer)
- 4 Selectable Music Ring-tones plus Vibration option
- Number Directory (that can be organized by categories, names, and so on by user) with direct dialing for up to 30 numbers
- Answering System (choose between 1 to 3 individual Voicemail Boxes)
- Memo Recording with choice for “slow talk” playback
- Any Key Answer with customer selection of Key if preferred

Cell Phone – Low Condition

Imagine you received, as a gift, the following product:

Cell Phone with the following features:

- LCD Screen with no choice of color for either font or background
- Caller ID with storage of number and name
- Built-in Speakerphone (predefined volume with no option to regulate it)
- 3 selectable Ring-tones (no vibration option included)
- Number Directory with direct dialing for up to 30 numbers (pre-selected organization of entries by name only)
- Answering System (2 individual Voicemail Boxes)
- Memo Recording (option for “slow talk” playback not included)
- Any Key Answer (no choice for selection of key if preferred)

Final Cell Phone Scenarios

High Condition

Product Specifications	Phone
Warranty (months)	
Labor/Parts	12/12
Phonebook with choice of direct dialing	YES, up to 30 numbers
Choice of color for LCD Screen	YES, for font/background
Calculator Function	YES
Choice of Ring Tones	15 fixed and up to 10 variable (composed)
Answering System	YES, with choice of 1 to 3 individual Voicemail Boxes
Choice of Vibration Alert	YES
Caller ID	YES, with selection of what to store (name, number, time, date)
Built-in Speakerphone	YES
Choice of Any Key Answer	YES, by customer if preferred
Choice of Memo Recording Option	YES, with option for "slow talk" playback
Talk Time	Up to 175 Min.
Height	4.3 in.
Width	1.9 in.
Depth	0.9 in.
Weight (with battery)	3.4 oz.

Low Condition

Product Specifications	Phone
Warranty (months)	
Labor/Parts	12/12
Phonebook with choice of direct dialing	Limited, up to 30 numbers
Choice of color for LCD Screen	Limited, white front & green background
Calculator Function	YES
Choice of Ring Tones	5 fixed (preset)
Answering System	YES, with 1 individual Voicemail Box
Choice of Vibration Alert	NO
Built-in Speakerphone	YES, with predefined volume
Choice of Any Key Answer	NO
Caller ID	YES (only name and number)
Choice of Memo Recording Option	YES
Talk Time	Up to 175 Min.
Height	4.3 in.
Width	1.9 in.
Depth	0.9 in.
Weight (with Battery)	3.4 oz.

Appendix C

Measures of Familiarity and Realism

Familiarity

Regarding the CCHT product you were presented with, are you:

Familiar	1	2	3	4	5	6	7	Unfamiliar
Inexperienced	1	2	3	4	5	6	7	Experienced
Knowledgeable	1	2	3	4	5	6	7	Not Knowledgeable

Realism

The description of the product was realistic.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
I had no difficulty imagining the product.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
This task made me self-conscious.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
This task made me feel uncomfortable.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
I am confident in my assessment of the product.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

Appendix D

Survey Instrument for the Main Study*

*There were two versions of the questionnaire with the final High and Low Cell Phone Scenarios presented in Appendix B.



MARKETING STUDY

I would like to request your voluntary participation in this survey. I am a doctoral candidate at Georgia State University and am doing this in connection with my dissertation, which is on Mass Customization. There are no correct or wrong answers.

This study consists of three parts. In the first part, you will be asked several questions about a product that will be described in the next page. In the second part, you will take a survey about technology and customization issues. Finally, in the third part, you will be asked to take one last survey about yourself. Please go through all 3 parts of the survey. Incomplete surveys can not be used in the final analysis of this study. Please be assured that all individual responses will be kept confidential.

Thank you very much for your participation.

M. Guilabert*

* For questions about this study or its results, you can contact M. Guilabert at: mktmbgx@langate.gsu.edu.

Part I:

In this survey, we want to learn about your opinion of cell phones and their features. You will read a brief introduction about wireless telephone services followed by a hypothetical description of a cell phone. Assume that the price of the cell phone is reasonable and the brand name is acceptable.

Digital wireless and cellular roots go back to the 1940s when commercial mobile telephony began. However, the first commercial handheld cell phone did not appear until late in the 1970s and early 1980s (in the case of Europe). By the early 1990s, cellular telephone deployment was worldwide. Nowadays most people, especially in the United States, have used and/or operated a cell phone and are increasingly demanding better services and features from the providers and manufacturers of these devices.

Now, consider a cell phone with the following characteristics:

Product Specifications	Phone
Warranty (months) Labor/Parts	12/12
Phonebook with choice of direct dialing	YES, up to 30 numbers
Choice of color for LCD Screen	YES, for font/background
Calculator Function	YES
Choice of Ring Tones	15 fixed and up to 10 variable (composed)
Answering System	YES, with choice of 1 to 3 individual Voicemail Boxes
Choice of Vibration Alert	YES
Caller ID	YES, with selection of what to store (name, number, time, date)
Built-in Speakerphone	YES
Choice of Any Key Answer	YES, by customer if preferred
Choice of Memo Recording Option	YES, with option for "slow talk" playback
Talk Time	Up to 175 Min.
Height	4.3 in.
Width	1.9 in.
Depth	0.9 in.
Weight (with Battery)	3.4 oz.

Now, please answer the following about the cell phone described in the previous page, by circling the number that corresponds best with how much you agree with the following statements:

		Strongly Disagree					Strongly Agree	
1.	This cell phone is made to suit individual needs	1	2	3	4	5	6	7
2.	The cell phone features are customized to satisfy each customer	1	2	3	4	5	6	7
3.	The services this cell phone offers appear to be very customizable	1	2	3	4	5	6	7
4.	The features of this cell phone make it a highly customized offering for customers	1	2	3	4	5	6	7
5.	This cell phone could meet individual customers' needs very efficiently	1	2	3	4	5	6	7
6.	The technology in this cell phone makes it very customizable to meet consumers' needs	1	2	3	4	5	6	7
7.	The features of this cell phone make it very adaptable to many consumers' needs	1	2	3	4	5	6	7

Again, thinking about the product earlier described, please read the following statements and indicate how much you agree or disagree with each one by circling your response:

		Strongly Disagree					Strongly Agree	
1.	I will find a cell phone with features like the one described above cumbersome to use	1	2	3	4	5	6	7
2.	In general, learning to operate a cell phone with features like the one described earlier will be easy for me	1	2	3	4	5	6	7
3.	Interacting with a cell phone with features like the one described will often be frustrating	1	2	3	4	5	6	7
4.	I will find it easy to get a cell phone like that to do what I want it to do	1	2	3	4	5	6	7
5.	A cell phone with features like the one described will be rigid and inflexible to interact with	1	2	3	4	5	6	7
6.	It will be easy for me to remember how to perform tasks with a cell phone like the one described above.....	1	2	3	4	5	6	7
7.	Interacting with a cell phone like the one described will require a lot of mental effort	1	2	3	4	5	6	7
8.	My interaction with a cell phone with features like the one described will be clear and understandable	1	2	3	4	5	6	7
9.	I will take a lot of effort to become skillful at using a cell phone like the one described	1	2	3	4	5	6	7
10.	Overall, I will find a cell phone with features like the one described easy to use	1	2	3	4	5	6	7

Now, think back to the cell phone described earlier and after reading the following statements, please indicate how much you agree or disagree with each one by circling your response:

	Strongly Disagree						Strongly Agree
1. Using a cell phone with features like the one described will improve the quality of my life	1	2	3	4	5	6	7
2. Using such a cell phone will give me greater control in my home life	1	2	3	4	5	6	7
3. A cell phone with features like the one described will enable me to accomplish tasks more quickly	1	2	3	4	5	6	7
4. Using such a cell phone will increase my productivity	1	2	3	4	5	6	7
5. Using a cell phone with features like the one described will improve my quality of life	1	2	3	4	5	6	7
6. A cell phone with features like the one described will allow me to accomplish more than would otherwise be possible	1	2	3	4	5	6	7
7. Using such a cell phone will enhance my effectiveness ...	1	2	3	4	5	6	7
8. Using a cell phone with features like the one described will make my life easier	1	2	3	4	5	6	7
9. Overall, I will find a cell phone like the one described useful ...	1	2	3	4	5	6	7

Next, I would like to know your opinion about the cell phone described above by finishing the following sentence:

In general, my opinion about a cell phone with features like the one described earlier is.... (Circle one number for each pair offered)

		Neither						
Good	1	2	3	4	5	6	7	Bad
Wise	1	2	3	4	5	6	7	Foolish
Unfavorable	1	2	3	4	5	6	7	Favorable
Beneficial	1	2	3	4	5	6	7	Harmful
Negative	1	2	3	4	5	6	7	Positive

To finish this section, again think back to the cell phone described above and please indicate the degree to which you agree or disagree by circling the corresponding number (assume you are in the market to use a new cell phone):

	Strongly Disagree							Strongly Agree
1. I presently intend to use a cell phone with features like the one described earlier	1	2	3	4	5	6	7	
2. I intend to use a cell phone with features like the one described if it becomes available	1	2	3	4	5	6	7	
3. I intend NOT to use a cell phone with features like the one described routinely	1	2	3	4	5	6	7	
4. Whenever possible, I intend NOT to use a cell phone with features like the one described	1	2	3	4	5	6	7	
5. Assuming I have access to a cell phone with features like the one described, I intend to use it	1	2	3	4	5	6	7	
6. Given that I have access to a cell phone with features like the one described, I predict that I would use it	1	2	3	4	5	6	7	

Part II

Technology is an important issue for many consumers. Next, please indicate the degree to which you agree or disagree with the following statements that relate to technology by circling the corresponding number:

	Strongly Disagree					Strongly Agree
1. You find new technologies to be mentally stimulating	1	2	3	4	5	
2. It is embarrassing when you have trouble with a high-tech gadget while people are watching	1	2	3	4	5	
3. If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place	1	2	3	4	5	
4. Other people come to you for advice on new technologies	1	2	3	4	5	
5. You like computer programs that allow you to tailor things to fit your own needs	1	2	3	4	5	
6. In general, you are among the first in your circle of friends to acquire new technology when it appears	1	2	3	4	5	
7. You do not consider it safe to do any kind of financial business online	1	2	3	4	5	
8. You can usually figure out new high-tech products and services without help from others	1	2	3	4	5	
9. You worry that information you send over the Internet will be seen by other people	1	2	3	4	5	
10. When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do ...	1	2	3	4	5	

Now I'd like to know your opinion about products and services designed and made to meet your individual needs and preferences (in other words "customized"). Again, read the following statements and indicate how much you agree or disagree with each:

	Strongly Disagree							Strongly Agree
1. I In general, customized products/services meet my needs better than standard ones	1	2	3	4	5	6	7	
2. I wish there were more products/services that could be easily customized to my taste	1	2	3	4	5	6	7	
3. I believe there is a need for more customized products/services	1	2	3	4	5	6	7	
4. If the price is reasonable for standard and customized products/services, I would choose customized ones	1	2	3	4	5	6	7	
5. If I can choose, I prefer to have customized products and services	1	2	3	4	5	6	7	

Part III

Age

- Less than 18
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65 and over

Household Income

- Less than \$20,000
- \$20,000–\$39,999
- \$40,000–\$59,999
- \$60,000–\$79,999
- \$80,000–\$99,999
- Over \$100,000

Gender

- Female
- Male

Education

- High school or less
- 1-3 years college
- 4 years college
- Over 4 years college

Family Status

- Single
- Married
- Divorced
- Widow/Widower
- Other

Are you... (check one)

- Employed Full-Time
- Employed Part-Time
- Not Currently Employed

Which of the following groups do you consider yourself a member of? (check one)

- Black (not of Hispanic origin)
- White (not of Hispanic origin)
- Hispanic
- Asian or Pacific Islander
- Native American, Eskimo, or Aleutian Islander
- Other (Please specify) _____

THANK YOU FOR YOUR HELP!

Appendix E

Measures for the Proposed Conceptual Model

Intention to Use CCHT products

I presently intend to use CCHT products	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>
I intend to use CCHT products when they become available	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>
I intend NOT to use CCHT products routinely	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>
Whenever possible, I intend NOT to use CCHT products	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>
Assuming I have access to CCHT products, I intend to use them	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>
Given that I have access to CCHT products, I predict that I would use them	<i>Strongly Disagree</i>	1	2	3	4	5	<i>Strongly Agree</i>

Attitudes Toward Using CCHT products

Below you are presented with five sets of adjectives. Rate how you generally feel when using a CCHT product.

Good	1	2	3	4	5	6	7	Bad
Wise	1	2	3	4	5	6	7	Foolish
Favorable	1	2	3	4	5	6	7	Unfavorable
Beneficial	1	2	3	4	5	6	7	Harmful
Positive	1	2	3	4	5	6	7	Negative

Perceived Ease of Use

I find CCHT products cumbersome to use	SD	1	2	3	4	5	6	7	SA
In general, learning to operate CCHT products is easy for me	SD	1	2	3	4	5	6	7	SA
Interacting with CCHT products is often frustrating	SD	1	2	3	4	5	6	7	SA
I find it easy to get CCHT products to do what I want it to do	SD	1	2	3	4	5	6	7	SA
CCHT products are rigid and inflexible to interact with	SD	1	2	3	4	5	6	7	SA
It is easy for me to remember how to perform tasks using CCHT products	SD	1	2	3	4	5	6	7	SA
Interacting with CCHT products requires a lot of mental effort	SD	1	2	3	4	5	6	7	SA
My interaction with CCHT products is clear and understandable	SD	1	2	3	4	5	6	7	SA
I find it takes a lot of effort to become skillful at using CCHT products	SD	1	2	3	4	5	6	7	SA
Overall, I find CCHT products easy to use	SD	1	2	3	4	5	6	7	SA

Perceived Usefulness

Using CCHT products improves the quality of my life	SD	1	2	3	4	5	6	7	SA
Using CCHT products gives me greater control in my home life	SD	1	2	3	4	5	6	7	SA
CCHT products enable me to accomplish tasks more quickly	SD	1	2	3	4	5	6	7	SA
Using CCHT products increases my productivity	SD	1	2	3	4	5	6	7	SA
Using CCHT products improves my quality of life	SD	1	2	3	4	5	6	7	SA
Using CCHT products allows me to accomplish more than would otherwise be possible	SD	1	2	3	4	5	6	7	SA
	SD	1	2	3	4	5	6	7	SA
Using CCHT products enhances my effectiveness	SD	1	2	3	4	5	6	7	SA
Using CCHT products makes my life easier	SD	1	2	3	4	5	6	7	SA
Overall I find CCHT products useful	SD	1	2	3	4	5	6	7	SA

Technology Readiness*

You find new technologies to be mentally stimulating	SD	D	N	A	SA
If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place	SD	D	N	A	SA
You like computer programs that allow you to tailor things to fit your own needs	SD	D	N	A	SA
You do not consider it safe to do any kind of financial business online	SD	D	N	A	SA
Other people come to you for advice on new technologies	SD	D	N	A	SA
You worry that information you send over the Internet will be seen by other people	SD	D	N	A	SA
You can usually figure out new high-tech products and services without help from others	SD	D	N	A	SA
When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do	SD	D	N	A	SA
In general, you are among the first in your circle of friends to acquire new technology when it appears	SD	D	N	A	SA
It is embarrassing when you have trouble with a high-tech gadget while people are watching	SD	D	N	A	SA

* These questions comprise the Technology Readiness Index. Copyrighted by A. Parasuraman and Rockbridge Associates, Inc., 1999. This scale may be duplicated only with written permission from the authors.

Customer Customization Sensitivity

In general, customized products/services meet my needs better than standard ones	SD	D	N	A	SA
I wish there were more products/services that could be easily customized to my taste	SD	D	N	A	SA
I believe there is a need for more customized products/services	SD	D	N	A	SA
If the price is reasonable for standard and customized products/services I would choose customized products/services	SD	D	N	A	SA
If I can choose I prefer to have customized products and services	SD	D	N	A	SA

Perceived Customization

This product is made to suit individual needs	SD	1	2	3	4	5	6	7	SA
The product features are customized to satisfy each customer	SD	1	2	3	4	5	6	7	SA
The services this product offers appear to be very customizable	SD	1	2	3	4	5	6	7	SA
The features of this product make it a highly customized offering for customers	SD	1	2	3	4	5	6	7	SA
This product could meet individual customers' needs very efficiently	SD	1	2	3	4	5	6	7	SA
The technology in this product makes it very customizable to meet consumers' needs	SD	1	2	3	4	5	6	7	SA
The features of this product make it very adaptable to many consumers' needs	SD	1	2	3	4	5	6	7	SA

Appendix F

Main Study Construct Reliabilities, Means, and Standard Deviations

Main Study Construct Reliabilities, Means, and Standard Deviations

<u>Perceived Customization/Customizability</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
This cell phone is made to suit individual needs	4.09	1.92	0.96
The cell phone features are customized to satisfy each customer	3.51	1.84	
The services this cell phone offers appear to be very customizable	3.64	1.87	
The features of this cell phone make it a highly customized offering for customers	3.57	1.87	
This cell phone could meet individual customers' needs very efficiently	3.94	1.81	
The technology in this cell phone makes it very customizable to meet consumers' needs	3.70	1.79	
The features of this cell phone make it very adaptable to many consumers' needs	3.76	1.80	
 <u>Perceived Ease of Use</u>	 <u>Mean</u>	 <u>StdDev.</u>	 <u>Reliability</u>
I will find a cell phone with features like the one described above cumbersome to use	4.50	1.80	0.78
In general, learning to operate a cell phone with features like the one described earlier will be easy for me	5.70	1.37	
Interacting with a cell phone with features like the one described will often be frustrating	5.08	1.75	
I will find it easy to get a cell phone like that to do what I want it to do	4.46	1.78	
A cell phone with features like the one described will be rigid and inflexible to interact with	4.28	1.86	
It will be easy for me to remember how to perform tasks with a cell phone like the one described above.....	5.35	1.42	
Interacting with a cell phone like the one described will require a lot of mental effort	5.57	1.38	
My interaction with a cell phone with features like the one described will be clear and understandable	5.35	1.39	
I will take a lot of effort to become skillful at using a cell phone like the one described	5.30	1.54	
Overall, I will find a cell phone with features like the one described easy to use	5.53	1.42	

<u>Perceived Usefulness</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
Using a cell phone with features like the one described will improve the quality of my life	3.15	1.52	0.94
Using such a cell phone will give me greater control in my home life	3.10	1.49	
A cell phone with features like the one described will enable me to accomplish tasks more quickly	3.69	1.57	
Using such a cell phone will increase my productivity	3.65	1.55	
A cell phone with features like the one described will allow me to accomplish more than would otherwise be possible	3.54	1.56	
Using such a cell phone will enhance my effectiveness ...	3.59	1.55	
Using a cell phone with features like the one described will make my life easier	3.77	1.58	
Overall, I will find a cell phone like the one described useful ...	4.08	1.67	

<u>Attitude toward CCHT Product</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
Bad - Good	4.44	1.68	0.90
Foolish - Wise	4.34	1.41	
Unfavorable - Favorable	4.19	1.78	
Harmful - Beneficial	4.77	1.37	
Negative - Positive	4.54	1.67	

<u>Intention to Use</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
I presently intend to use a cell phone with features like the one described earlier	3.90	1.91	0.93
I intend to use a cell phone with features like the one described if it becomes available	3.79	1.86	
I intend NOT to use a cell phone with features like the one described routinely	4.32	2.10	
Whenever possible, I intend NOT to use a cell phone with features like the one described	4.39	2.05	
Assuming I have access to a cell phone with features like the one described, I intend to use it	4.60	1.73	
Given that I have access to a cell phone with features like the one described, I predict that I would use it	4.71	1.70	

<u>Technology Readiness</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
You find new technologies to be mentally stimulating	3.98	0.98	0.68
It is embarrassing when you have trouble with a high-tech gadget while people are watching	2.88	1.18	
If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place	2.75	1.11	
Other people come to you for advice on new technologies	3.15	1.06	
You like computer programs that allow you to tailor things to fit your own needs	3.96	0.97	
In general, you are among the first in your circle of friends to acquire new technology when it appears	2.83	1.18	
You do not consider it safe to do any kind of financial business online	2.52	1.19	
You can usually figure out new high-tech products and services without help from others	3.63	1.01	
You worry that information you send over the Internet will be seen by other people	2.99	1.15	
When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do ...	2.39	1.08	

<u>Customization Sensitivity</u>	<u>Mean</u>	<u>StdDev.</u>	<u>Reliability</u>
In general, customized products/services meet my needs better than standard ones	5.37	1.30	0.92
I wish there were more products/services that could be easily customized to my taste	5.55	1.21	
I believe there is a need for more customized products/services	5.33	1.33	
If the price is reasonable for standard and customized products/services, I would choose customized ones	5.84	1.12	
If I can choose, I prefer to have customized products and services	5.79	1.18	

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