INTERACTIVE ESHOPPING EXPERIENCE:

AN EMPIRICAL INVESTIGATION

A Dissertation

by

AHMED YOUSRY MOHAMED MAHFOUZ

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2004

Major Subject: Information and Operations Management

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ABSTRACT

Interactive Eshopping Experience:
An Empirical Investigation. (December 2004)
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Utilizing an experimental design, the study investigates the effects of eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high) on the consequences of eshopping (site attitude and future purchase intentions), as mediated by eshopping experience (sensory, affective, and cognitive) and flow experience (control, attention focus, and cognitive enjoyment).

Structural equation modeling was used for data analysis. Eshopping behavior had a weak negative effect, and interactivity level had a weak positive effect, on eshopping experience. Experiential eshopping behavior decreased eshopping experience more than mixed or utilitarian eshopping behavior did. The latter two behaviors were not significantly different from each other in terms of eshopping experience. High interactivity level web sites increased eshopping experience more than low interactivity level sites did. Interactivity level had a weak negative effect on flow's control dimension and a moderate positive effect on flow's cognitive enjoyment component. High interactivity level sites moderately increased cognitive enjoyment more than low interactivity level sites did. Eshopping experience strongly and positively influenced flow experience in terms of control and cognitive enjoyment, and moderately impacted attention focus. Cognitive enjoyment had a strong positive effect on site attitude and future purchase intentions. However, control and attention focus did not significantly affect future purchase intentions. The study found an indirect effect of eshopping behavior on site attitude, instead of the traditional effect of attitude on behavior based on

the theory of reasoned action and technology acceptance model. The results of the pilot study ($N = 105$) were consistent with the final study ($N = 310$).

The study attempts to add to the small base of existing studies that examine eshopping experience and flow theory in an ecommerce setting (Novak et al. 2003; Skadberg and Kimmel 2004). The present study contributes to the online consumer behavior literature by utilizing flow theory and investigating the mediating effects of eshopping experience and flow experience on the consequences of eshopping. The findings should help inform web site design, facilitating the creation of sites which are more responsive to users by providing interactive features and understanding eshopping behaviors which users exhibit.

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CHAPTER I

INTRODUCTION

Basis of the Study

When consumers shop in a brick-and-mortar store, they have a chance to browse the aisles and inspect products carefully and closely. This shopping experience is enhanced through the stimulation of the senses with colorful displays, ambient music, inviting scents, physical inspection of products, and interaction with salespeople or other customers. Eshopping lacks these real experiences, but makes up for it in terms of convenience, cost, and time savings. Shopping enjoyment and convenience are crucial to online customer satisfaction (Lee et al. 2003). However, an interactive, well-designed user interface may overcome some of these limitations to create a more enjoyable shopping experience (Lohse 1998; Koufaris 2002).

The present study examines the factors that affect the consequences of eshopping, future purchase intentions and site attitude. These factors include eshopping behavior of users, interactive features of the site's user interface, and elements of eshopping that affect users' experiences and flow aspects of their eshopping. All of these research variables are introduced and discussed below. The relationships of these variables to one another as they appear in the model are shown in Figure 1.

This dissertation follows the style and format of *MIS Quarterly*.

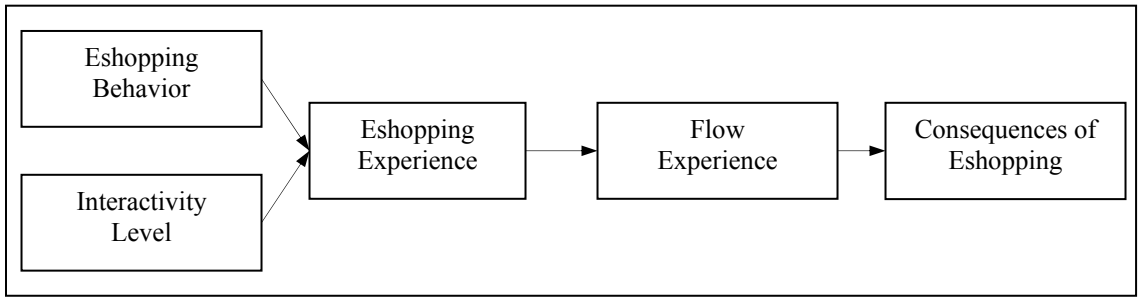

Figure 1. Overview of the Research Model

Eshopping behavior is defined as the way users shop online and is classified as experiential, utilitarian (Assael 1998; Hoffman and Novak 1996; Holbrook and Hirschman 1982; Nielsen 2000; Novak et al. 2000, 2003; Wolfinbarger and Gilly 2001), or mixed. *Experiential users* shop for fun and entertainment, while *utilitarian users* shop for a specific purpose or goal, such as product information and purchase. *Mixed users* exhibit a combination of both experiential and utilitarian characteristics. Mixed users shop for entertainment and fun (experiential qualities) and have a purpose or a goal in mind (utilitarian characteristics), such as purchasing products and services. Users report the primary uses of the Internet are the following: collecting information and research (57%), shopping and searching for products (11.7%), education (10.7%), entertainment (6.4%), sports (2.4%), sales (1%), and other (10.7%) (Torkzadeh and Dhillon 2002).

As users visit a web site to shop online, they communicate with the system via its interface. An important component of the user interface is *interactivity*, which is the direct communication and involvement between users and the system interface in order to change and customize a web site's look, feel, content (Palmer 2002; Zhu and Kraemer 2002), and the site's product offerings, according to users' personal preferences. In the present study, interactivity level has two levels: low and high. *Low interactivity level* is composed of *textual* descriptions and product information, as well as *graphical*, static 2D images of items. *High level interactivity* includes the two low level elements and expands to incorporate three other highly interactive features: media vividness,

customization, and personalization. *Media vividness* is the degree of media richness in a site, such as text, images, sound, video, and 3D simulations. *Customization* is the ability that permits users to make unique interface changes to create individual user experiences through tailor-made products and services. *Personalization* is the ability of a web site to track users' information and preferences using user profiles to offer individualized greetings, suggestions, and information on relevant products and services that create a personal, unique, and friendly user interface (Thorbjornsen et al. 2002; Zhu and Kraemer 2002). These rich interactive features engage users in many ways not available in other media (Agrawal and Venkatesh 2002). In addition, interactivity not only helps to bridge the gap between a physical and an online store but also can provide features unavailable in a real store. For example, amazon.com allows users to post their ratings of books, which is a unique characteristic not present in a real bookstore (Alba et al. 1997).

Interactivity is an important determinant of system quality for web customer satisfaction (McKinney et al. 2002). Both eshopping behavior and interactivity level influence the eshopping experience, as users are connecting with sites and their products through the interface. They are also part of the *experience economy*, which tries to create a memorable experience in consumers' minds (Pine and Gilmore 1999).

This *eshopping experience* is the event that users go through with a web site's product offerings while shopping online and encompasses three types of experiences: sensory, affective, and cognitive (Schmitt 1999, 2003). *Sensory eshopping experiences* stimulate the senses, which in a web context include visual, aural, and simulated tactile feelings through 3D manipulations of objects (Li et al. 2002; Minsky 1980; Steuer 1992). *Affective eshopping experiences* deal with emotions and feelings. Users experience fun and entertainment as they shop online, play games, or correspond with others on the web (Rosenbloom 2003; Swartout and Van Lent 2003). *Cognitive eshopping experiences* engage users in creative, problem-solving, and curious ways, such as the case with landsend.com, which provides virtual models based on customers' physiques to enhance their shopping, while solving the problem of finding an appropriate outfit.

Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively. Csikszentmihalyi (2000) views the aggregation of sensations, emotions, and cognitions as a complete experience, leading potentially to a flow experience.

According to flow theory (Csikszentmihalyi 1975, 1990, 2000), individuals achieve a state of flow or *flow experience* when they are engaged in an activity that they may be oblivious to their surroundings and potentially lose track of time and even of self. Athletes equate this to *entering the zone*, and video gamers liken this to feelings of immersion in the game or *being lost in the experience*. As users shop online with a clear goal, they are using their Internet skills to complete a particular task at hand, either for entertainment or product search and purchase. They may experience three main elements of flow: control, attention focus, and cognitive enjoyment (Webster et al. 1993). Users are *controlling* the interaction with the web site through system response, feedback, or choices among alternative in the site. As they are concentrating on their web surfing and immersed in their eshopping, users filter out irrelevant or distracting stimulus from the environment, achieving *attention focus*. The web site provides curious new options for interaction, and the users may be carrying out this site navigation and eshopping for its own sake and enjoyment, or intrinsic interest. This combination of curiosity and intrinsic interest results in *cognitive enjoyment* (Webster et al. 1993). These conditions of control, attention focus, and cognitive enjoyment create a flow state (Webster et al. 1993), as the Internet allows for a flow experience (Chen et al. 1999; Novak et al. 2000, 2003).

Finally, while users are eshopping, they formulate an attitude towards the site, or *site attitude*. While they are in a state of flow, they are more likely to learn about the content of a site, and consequently this learning results in attitudinal and behavioral changes, such as positive site attitudes or revisits (Skadberg and Kimmel 2004). Users

may ultimately decide as a consequence of their eshopping to *intend to purchase* an item or a product in the future. These consequences are important to etailers, as they may impact their profit margins and bottom line.

Incorporating all the above variables, the present study utilizes an experimental design and structural equation modeling (SEM) to ascertain the effects of eshopping behavior and interactivity level on the consequences of eshopping, as mediated by eshopping experience and flow experience. Landsend.com is a suitable setting for the present study as it has a highly interactive site. In addition, it is a very successful ecommerce site (Reda 2003), the world's largest clothing etailer in terms of business volume (Comer 2003). From 1999 to 2002, landsend.com online sales increased dramatically from $61 million to $299 million (Ives and Piccoli 2003).

Research Questions

The dissertation examines the impact of eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high) on consequences of eshopping (future purchase intentions and site attitude), as mediated by eshopping experience (sensory, affective, and cognitive) and flow experience (control, attention focus, and cognitive enjoyment). The model attempts to answer the following research questions:

- What are the effects of eshopping behavior and interactivity level on eshopping experience?
- What are the mediating effects of eshopping experience and flow experience on the consequences of eshopping?

In terms of potential research significance of the study, by investigating these research questions, the study attempts to add to the small base of existing studies that examine eshopping experience and flow theory in online environments in an ecommerce setting (Novak et al. 2003; Skadberg and Kimmel 2004). The examination of these research questions in the present study contributes to the online consumer behavior literature by utilizing flow theory and investigating the mediating effects of eshopping experience and flow experience on the consequences of eshopping. Regarding practical

significance of the study, the findings should help inform web site design, facilitating the creation of sites which are more responsive to users by providing interactive features and understanding eshopping behaviors users exhibit.

CHAPTER II

LITERATURE REVIEW

This chapter presents a literature review underlying the research model. The research model investigates the effects of eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high) on the consequences of eshopping (site attitude and future purchase intentions), as mediated by eshopping experience (sensory, affective, and cognitive) and flow experience (control, attention focus, and cognitive enjoyment). A detailed overview of the research model is shown in Figure 2.

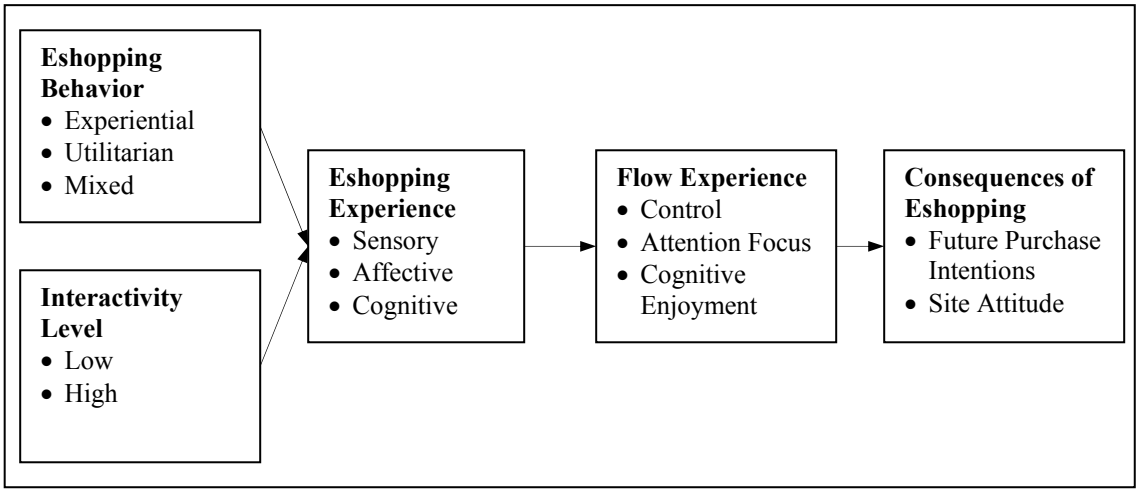

Figure 2. Detailed Overview of the Research Model

Contributing Factors

Eshopping behavior and interactivity level are the contributing factors or the exogenous variables for consequences of eshopping, as mediated by eshopping experience and flow experience.

Eshopping Behavior

Eshopping behavior is defined as the way users shop online and is classified as *experiential*, *utilitarian* (Assael 1998; Hoffman and Novak 1996; Holbrook and Hirschman 1982; Nielsen 2000; Novak et al. 2000, 2003; Wolfinbarger and Gilly 2001), or *mixed*.

A comparison of experiential and utilitarian eshopping behaviors is shown in Table 1 (Assael 1998; Hoffman and Novak 1996; Nielsen 2000; Novak et al. 2000, 2003; Wolfinbarger and Gilly 2001). Mixed users exhibit qualities of both experiential and utilitarian eshoppers.

Table 1. Experiential and Utilitarian Eshopping Behavior (Assael 1998; Hoffman and Novak 1996; Nielsen 2000; Novak et al. 2000, 2003; Wolfinbarger and Gilly 2001)

Attribute	Experiential	Utilitarian
Common Names	Hedonic	Task-oriented, goal-directed
Purpose	Entertainment	Efficiency, goal attainment
Preferences	Product involvement	Accessibility, convenience
	Social interaction	Product selection
	Positive surprise	Information availability
Outcome	Fun, the experience itself	Commitment to goal
Interface	Symbolic and imagery	Product information
Stimulation	Sensory	Product attribute information
Information Search	Nondirected, on-going	Directed, purchase-specific
Information Sources	Personal	Nonpersonal
Site Navigation	Navigational	Goal-directed
Motivation	Intrinsic	Extrinsic

Experiential Eshopping Behavior

Experiential users view shopping as a pleasurable event (Assael 1998; Novak et al. 2000, 2003). Experiential eshoppers enjoy the hunt for bargains online or social interaction with friends while shopping. They like to navigate web sites to feel and experience the pleasure of shopping for an item, engaged in an emotional and

entertaining way. Hence, they may use the web for entertainment or online chats (Novak et al. 2000, 2003). Sensory stimulation via an interactive web site would be very important to experiential eshoppers (Assael 1998). They are more likely to revisit sites they find enjoyable. Shopping enjoyment and perceived usefulness of a site are important predictors of revisiting a site in the future (Guo 2003; Koufaris 2002).

Utilitarian Eshopping Behavior

Utilitarian eshoppers, on the other hand, view shopping as a means to an end. They are also task-oriented and have a specific goal to look for practical benefits and information regarding the product functions, while they are visiting a web site or browsing in a store (Assael 1998; Novak et al. 2000, 2003). For example, they use the web for work, search for particular reference information, or look up online job listings (Novak et al. 2000, 2003). Hence, experiential behavior is *shopping as a purpose*, and utilitarian behavior is *shopping with a purpose* (Babin et al. 1994).

A Comparison

Experiential or utilitarian behavior in computer-mediated environments can be characterized along the following dimensions: intrinsic versus extrinsic motivation, ritualized versus instrumental orientation, enduring versus situational involvement, hedonic versus utilitarian benefits, nondirected versus directed search, and navigational versus goal-directed choice (Hoffman and Novak 1996). Hoffman and Novak (1996) and Novak et al. (2000) also give several examples. For example, when users surf the web regularly for fun, their experience is intrinsically motivated, ritualized, and experiential. When company IT personnel purchase hardware via the web, the experience is extrinsically motivated, instrumental, and goal-directed. When consumers surf the web continuously for information about products, the search is nondirected or ongoing, and hence the involvement is enduring with the item. When the search is prepurchase, the experience is directed to specifically buy, and hence the involvement is situational with the purchase.

Mixed Eshopping Behavior

Mixed users exhibit both experiential and utilitarian qualities. They shop for entertainment and fun coupled with the specific purpose of accomplishing a task or a goal, such as purchasing merchandise. Usability studies show that about a fifth of users are *link-dominant* (*i.e.* experiential), a little over than a half are *search-dominant* (*i.e.* utilitarian), and the rest fall under *mixed behavior* (Nielsen 2000). Link-dominant users are experiential in nature and tend to look around the site. Search-dominant users are utilitarian and go directly to the *Search* button to locate a specific piece of information or carry out a task. Mixed-behavior users use both link and search following, depending on a given situation or their needs at a given moment in time.

Interactivity Level

Interactivity is the direct communication and involvement between users and the system interface in order to change and customize a web site's look, feel, content (Palmer 2002; Zhu and Kraemer 2002), and the site's product offerings, according to users' personal preferences. In the present study, interactivity is referred to as *interactivity level* and has two levels: low and high. *Low interactivity level* is interactivity that utilizes textual descriptions of product information, and graphical images of those products. The *high interactivity level* is interactivity that expands beyond those two elements to include media vividness, customization, and personalization. These features are defined under their respective sections below.

Highly Interactive Features

Ecommerce companies recognize higher levels of interactivity and content lead to a web site's success, as well as user perceived satisfaction, effectiveness, efficiency, value, and attitude towards a web site (Coyle and Thorson 2001; Palmer 2002; Teo et al. 2003). Hence, an interactive user interface enhances the eshopping experience. Unlike brick-and-mortar stores, shopping online lacks being physically in a store and interacting with salespeople (Lohse 1998). However, a well-designed interface with highly

interactive features may combat these limitations and help users in their product searches (Koufaris 2002). Three aspects of high interactivity level of relevance and interest to the present study are media vividness, customization, and personalization.

Media Vividness

Media vividness is the degree of media richness in a site, such as text, images, sound, video, and 3D simulations. For example, landsend.com site has *My Virtual Model* feature, which is a 3D representation of user physical characteristics that aids users in their eshopping. Users perceive multimedia content to be important to web site success (Palmer 2002). Dealing with how an environment conveys sensory data, media vividness helps to create a sense of presence (or being there in an environment) through *breadth* and *depth* (Steuer 1992). Sensory breadth is the number and scope of information presented in a sensory dimension or channel at the same time, while depth is the resolution within the presentation of that information. In essence, breadth is the quantity of sensory channels that a medium uses (e.g. visual, aural, etc.), and depth is the quality within each communication channel (Klein 2003; Steuer 1992). For example, HDTV has greater depth than analog TV. As it mainly stimulates the sensations of sight, sound, and tactile simulations, a web site may be limited in breadth but sufficient in depth. A rich, interactive environment with 3D simulations allows for compelling interactivity (Tsang et al. 2003). Larson and Czerwinski (1998) examine breadth and depth of information in web site design. In their study, breadth refers to showing many pieces of information, while depth points to displaying fewer pieces of information in more detail. They find that depth increases the time spent browsing, and hence fewer levels in the web site structure are best suited for handling huge amounts of information. Coyle and Thorson (2001) conclude that increased levels of media vividness result in more positive attitudes towards a web site.

One major area that benefits from interface vividness is the entertainment software industry, for example in computer and video games. They enhance the user experience due to their immersive features and 3D visual simulations (Rosenbloom

2003; Swartout and Van Lent 2003). Immersion relies on how many (breadth) and how much (depth) it stimulates the senses (Whitton 2003).

Customization

Customization is the ability that permits users to make unique interface changes to create individual user experiences through tailor-made products and services. It is user-centric or buyer-centric (Wind and Rangaswamy 2001). Hence, the user, and not the web site is behind the choices and decisions. It includes custom-design products and the selection of different components and characteristics of products (McKinney et al. 2002; Williams and Larson 2000). For example, landsend.com site allows customers to tailor-make clothes according to their own tastes, using *Lands' End Custom Clothing* feature.

Palmer (2002) argues that customization is important to a web site's success. Likewise, web sites need to enhance interactivity by maximizing customization (Chaudhury et al. 2001). For example, dell.com is the first company to allow users to custom-configure computer specifications online for their own taste and use (Ives and Piccoli 2003). In addition, customization (as well as personalization) is an important feature in web sites (Agrawal and Venkatesh 2002), that allow companies to distinguish their product and service offerings well, according to a study by Palmer and Griffith (1998) that examined 250 *Fortune 500* web sites.

Through the web interface, customers visiting reflect.com can create, design, name, and label their own unique line of cosmetics (Gobé 2001; Rasmusson 2000). Other examples of web sites providing customization include the following (Gobé 2001): customized news (newsedge.com); novel shoes (digitoe.com); tailor-made clothing and perfumes (ashford.com); dolls made with desired skin, hair, or eye color (barbie.com); and high-end cosmetics (lab21.com).

Personalization

Personalization is the ability of a web site to track users' information and preferences using user profiles to offer individualized greetings, suggestions, and

information on relevant products and services that create a personal, unique, and friendly user interface (Thorbjornsen et al. 2002; Zhu and Kraemer 2002). While users drive customization, web sites and companies push personalization (Williams and Larson 2000; Wind and Rangaswamy 2001). For example, landsend.com establishes *My Personal Shopper*, who is an expert shopper that suggests products, matching eshopper's preferences and style. By collecting customer information, technology on the Internet is allowing the creation of personalized web sites, where individuals can have unique experiences with content designed just for themselves and no one else (Gobé 2001).

Personalization provides more accurate searches, faster transactions, and increased quality of the web site experience (Chakraborty 2002), and it is one of the important metrics in dealing with user behavior needs (Straub et al. 2002). Furthermore, it is one of the components under the information quality dimension in the ecommerce metrics of the updated version of the DeLone and McLean Model of Information Systems Success (1992, 2003). Hence, evidence suggests companies that use the web as a one-to-one, participative, and interactive medium will be successes (Chaudhury et al. 2001).

There are two kinds of dynamic content personalization: *intentional* and *automatic* (Van Duyne et al. 2003). *Intentional personalization* occurs when companies collect data on consumers that the consumers supply themselves. Consumers are then identified based on their user profile or *persona* (Garrett 2003; Van Duyne 2003) and matched with any of the following personalization applications: rule-based matching, matching agents, and collaborating filtering (Thorbjornsen et al. 2002). The former two connect consumers with relevant information content on products and services. The latter matches users with other similar users' profiles to create personalized content, such as in the case of amazon.com where the site automatically generates a list of similar products ordered by other consumers with corresponding interests or tastes. This latter form of interaction is an example of *automatic personalization* since users are not directly aware that the site is providing them with relevant information. Similar to more.com's *QuickShop* (Wolfinbarger and Gilly 2001), amazon.com also has a *One-*

Click feature that stores customer information including payment method, so that this information is entered only once for prompt checkout. Cdnow.com recommends a list of music albums based on what customers like, and eddiebauer.com has a *Reminder Service* to email users regarding their anniversaries, holidays, or needed addresses (Gillenson et al. 1999).

Relationship of Behavior and Interactivity to Experience

As users shop and navigate online, they exhibit experiential, utilitarian, or mixed behavior. In addition, Wolfinbarger and Gilly (2001) report that experiential behavior enhances affective eshopping experiences by creating more positive moods, which in turn increases impulse shopping. Even though both experiential and utilitarian types of eshoppers have affective experiences, pleasure and arousal are much stronger with experiential users (Babin et al. 1994). By the same token, utilitarian eshoppers feel unfulfilled if they do not complete their shopping goal (Babin et al. 1994). Mixed eshoppers combine aspects from both experiential and utilitarian behavior. Mixed users shop for entertainment and fun (experiential qualities) and have a purpose or a goal in mind (utilitarian characteristics), such as purchasing products and services.

When users surf web sites such as landsend.com and look for products, they also interact with the system via the interface and its web site design. Interactivity through multimedia characteristics and rich media engage individuals in ways not available in other media (Agrawal and Venkatesh 2002). Interactivity incites visual stimulations as part of a sensory experience to enhance shopping online (Li et al. 2001). Such interactive features result in more positive moods and attitudes towards a web site (Coyle and Thorson 2001; Teo et al. 2003). For example, rich 3D product simulations create a more realistic emotional and cognitive eshopping experience than 2D simulations do (Li et al. 2002). In contrast to 2D, 3D requires more cognitive activities due to the nature of 3D interface design and users' feelings of (tele)presence (or feelings of being transported to a virtual environment) while interacting with the products (Li et al. 2002). Since it requires more user attention, focus, and concentration, interactivity demands greater

cognitive processing than do traditional media or online experiences with low interactive media (Liu and Shrum 2002). When shoppers browse the aisles in a virtual mall they feel a sense of being in a mall, shopping via a virtual shopping cart, and feeling items by zooming in and out as if they are picking them up in a real store (Li et al. 2002).

These interactive interface features may help to substitute for the in-store shopping experience (Lohse 1998; Koufaris 2002) and bring it to life. Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively. Csikszentmihalyi (2000) views the aggregation of sensations, emotions, and cognitions as a complete experience, leading potentially to a flow experience. This goal is achieved with better understanding of the effects of the exogenous variables, eshopping behavior and interactivity level, on eshopping experience. Both eshopping behavior and interactivity level influence the eshopping experience, as users are connecting with sites and their products through the interface. They are also part of the *experience economy*, which tries to create a memorable experience in consumers' minds (Pine and Gilmore 1999).

Mediating Experiences

The mediating variables between the exogenous variables (eshopping behavior and interactivity level) and the endogenous (outcome) variables (consequences of eshopping) are eshopping experience (sensory, affective, and cognitive) and flow experience (control, attention focus, and cognitive enjoyment).

Both eshopping experience and flow experience mediate the indirect effects of eshopping behavior and interactivity level on the consequences of eshopping. In terms of eshopping behavior, the way users shop impacts their eshopping experience since they may be shopping for fun or a goal. As eshoppers navigate a site, they interact with the

system via the interactive features of the interface. Hence interactivity level of the site influences the eshopping experience. This eshopping experience may lead to a higher experience, flow experience, with feelings of control, heightened concentration, and enjoyment regarding the navigation of the site or eshopping task at hand. While users are eshopping, they formulate an attitude towards the site. While they are in a state of flow, they are more likely to learn about the content of a site, and consequently this may result in attitudinal and behavioral changes, such as positive site attitudes or revisits (Skadberg and Kimmel 2004). Users may ultimately decide as a consequence of their eshopping to intend to purchase an item or a product in the future.

Eshopping Experience

Eshopping experience is the event that users go through with a web site's product offerings while shopping online and encompasses their *sensory, affective,* and *cognitive* participation, which are detailed in respective sections below (Schmitt 1999, 2003). Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively.

Experiences are composed of events, which are occurrences at a specific moment in time and space (Jain 2003). Schmitt (1999, 2003) defines experiences as events that occur privately and are self-induced as a result of stimulation, involving either direct participation or mere observation of those events. The customer experience transcends the functional value of a web site or a product sold on that site. Experiences enhance the product experience through the senses (Jain 2003; Schmitt 1999, 2003), emotions, cognition, behaviors, and relations to the product itself, stimulating both the heart and the mind (Schmitt 1999, 2003).

Companies that create products as experiences are part of the *experience economy*, which relies on staging an experience that makes the product or service memorable in the eyes of the consumer (Pine and Gilmore 1999). For example, an online computer game is not just a game but a whole entertainment experience with interactivity, chat rooms, motion-based simulators, and especially multiplayers over the Internet, allowing for a shared experience (Pine and Gilmore 1999; Sherman and Craig 2003). Three types of eshopping experience are sensory, affective, and cognitive.

Sensory Eshopping Experience

Sensory eshopping experience is an eshopping event that stimulates as many of the five senses or modalities as possible virtually through sight/vision (visual), sound (aural or auditory), touch (tactile or haptic), smell (olfactory), and taste (gustatory) (Schmitt 1999, 2003). Since the senses of smell and taste are hard to simulate in a virtual environment, seeing, hearing, and tactile simulations are the three senses that most likely to be offered on the web. Tactile sensations can be induced via feelings of telepresence in a virtual environment or by sensory substitution (Sherman and Craig 2003). When users are in a virtual dressing room in eddiebauer.com, they feel as if they are transported to a real store or walking in a virtual mall, a sensation known as *telepresence* (Steuer 1992). *Sensory substitution* occurs, for example, when one of the senses replaces another, such as visual versus haptic sensations. For example, users, who visually manipulate 3D objects on the screen, feel the force feedback against the mouse to convey the shape and texture of an item (Li et al. 2001; Sherman and Craig 2003). Examples of visual, tactile, and behavioral simulations are shown in Table 2 (Li et al. 2001).

Table 2. 3D Virtual Simulations and Interface Characteristics (Li et al. 2001)

Domain/Interface	Definition
Visual Simulation	
Visual Translation	Moving a product around, changing its size, zooming in/out
Rotation	Viewing through many angles: back, front, sides, top, bottom
Contextualization	Placing an object in an environment, like in a room
Stereopsis	Different viewpoints to each eye enhancing depth and shape
Tactile Simulation	
Touch/Manipulation	Motor control and force feedback allowing haptic forces (e.g. weigh, resistance) to be felt via the mouse movement
Behavioral Simulation	
Animation	Predictable movements and behaviors of product
Customization	Modifying form or content of a product
Spatial Navigation	Moving in virtual space (like virtual mall)

Sensory eshopping experiences include how a web site engages the senses, is perceptually interesting, and appeals to users (Schmitt 1999, 2003). The result of a good sensory experience is high-quality sensory immersion, which is an important factor in virtual environments, as well as other factors like well-designed software and interested users (Whitton 2003). Consequently, this results in more appealing eshopping experiences, which are rich and vivid in multimedia and interactivity in the user interface, adding value to users. For example, amazon.com is an excellent example of a site that gives a true online experience through its interface (Schmitt 2003). The site is visually appealing and invokes a tactile sensation through its *Look Inside This Book* (and *Search Inside This Book*) features, simulating the feeling of flipping pages in a real book. Amazon.com also uses xippix.com technology employing *Image Pump* so that buyers can zoom in and inspect products, with high resolution capabilities and from many different views and angles, replicating the in-store experience (Wolfinbarger and Gilly 2001). Also, users achieve aural and audiovisual stimulation when they sample music CDs before deciding to buy them on amazon.com.

Affective Eshopping Experience

Affective eshopping experience is an online shopping event that stresses the emotional component of shopping (Schmitt 1999, 2003). This includes how a web site places users in a certain mood, makes them respond in an emotional fashion, and appeals to their feelings (Schmitt 1999, 2003). Users' feelings may range from somewhat positive to real joy and excitement when they interact with a pleasing web site and its product offerings. Restrictive or user-unfriendly site navigation results in negative emotions and reduces the likelihood of future site revisits (Dailey 2004). Users experience entertainment as they play games or communicate with others online (Rosenbloom 2003; Swartout and Van Lent 2003). As in the case of these games, web site designers should allow for a level of challenge to arouse users (Novak et al. 2000). In addition, due to experiential shopping, playfulness results in a more positive mood and satisfaction (Hoffman and Novak 1996).

Emotions and affective responses towards a web site or virtual environment are important to users (Agrawal and Venkatesh 2002). Sociopsychological value, comprised of shopping enjoyment and convenience, is vital to online customer satisfaction (Lee et al. 2003). For example, a vacation experience feeling occurs while someone is surfing the clubmed.com homepage to book a getaway (Schmitt 1999, 2003). It focuses on a customized experience for each visitor, who is whisked away with cartoon characters to virtual villages in *Village Vibes*, which allows them to visit a destination beforehand, and to *Visions of a Club Med Vacation*, which is an emotional fantasy of a desired vacation (Schmitt 1999).

Cognitive Eshopping Experience

Cognitive eshopping experience is an eshopping event that engages users in creative and problem-solving ways and impacts their thinking (Schmitt 1999, 2003). These experiences include how a web site intrigues users, stimulates their curiosity, and appeals to their creative cognition (Schmitt 1999, 2003). These also include interactive features and appropriate interface metaphors in a web site, which may invoke curiosity

and fascination. Rich multimedia and interactivity result in a cognitive absorption or cognitive engagement state for users (Agrawal and Venkatesh 2002). A web site is enjoyable especially when it employs a pleasing metaphor, such as likening the design of the interface to a production of a theater play (Laurel 1991) or a cyber robot theater experience (Breazeal et al. 2003). Reflect.com employs visual metaphors to allow customers to choose their own look, as they customize product features, such as color and shading of cosmetics (Haeberle 2002). Hence, metaphors and, in turn, the user's mental model affect the cognitive experience within the virtual environment.

Computer playfulness, or spontaneous and imaginative interactions with computers such as experimenting with new features and menu options of a piece of software, is cognitive and intellectual in nature (Webster and Martocchio 1992). When eshoppers navigate and *try clothes on* using their virtual model in landsend.com, they are solving a problem of finding and matching suitable clothes into a desirable ensemble. Using these cognitive skills is important, since cognitive and emotional responses by users to a site are important predictors of return visits (Guo 2003; Koufaris 2002). In contrast to 2D product simulations, 3D requires more cognitive activities due to the nature of 3D interface design and users' feelings of (tele)presence (or feelings of being transported to a virtual environment) while interacting with the products (Li et al. 2002). With user control and media richness (vividness) in web sites, users report sensations of telepresence, which subsequently affects their cognitive responses (Klein 2003). In another example, when army personnel train on their experience-based educational systems, they challenge their cognitive skills through real-time games to better prepare them for actual combat (Swartout and Van Lent 2003).

Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively. Csikszentmihalyi

(2000) views the aggregation of sensations, emotions, and cognitions as a complete experience, leading potentially to a flow experience.

Flow Experience and Theory

Pronounced *chick-SENT-me-high*, Csikszentmihalyi's *flow theory* (1975, 1990, 2000) views flow as a state in which individuals are so engaged in an activity that they might be oblivious to the world around them and possibly lose track of time and even of self. Known as *flow experience* or *state of flow*, this state becomes an *optimal experience*, another synonym for flow, when individuals feel they are in control of their actions and in a sense of enjoyment and exhilaration, when the levels of task challenges and their own skills are both equally high. For example, some athletes or people who exercise vigorously report they have *entered the zone* at a peak moment of their game or exercise routine (Csikszentmihalyi 1997). In order to facilitate a sense of flow, online sites need to be stimulating and responsive to users. Otherwise, *boredom*, *anxiety*, and *apathy* experiences materialize (Csikszentmihalyi 1975, 2000). Boredom results when the interface or site is not challenging enough, while anxiety occurs if the system is too difficult to use. Apathy results when skills of users and challenges of sites are too low, while a flow experience takes place when both skills and challenges are congruent to one another (Csikszentmihalyi 1975, 2000). In essence, flow is created when individuals achieve concentration effortlessly while carrying out a specific set of objectives that need responses at the workplace, in leisure, or in social engagements (Csikszentmihalyi 1997).

An important component of this optimal experience is that it is an end in itself or a reward for its own sake, becoming what is called *autotelic*, from the Greek word *auto* or self and *telos* or goal (Csikszentmihalyi 2000). An autotelic experience is intrinsically interesting and involves establishing goals, becoming absorbed in the activity, paying attention and concentrating on what is happening, and learning to enjoy direct experience. Teaching to educate children is not autotelic, but teaching them because one likes to interact with children is autotelic (Csikszentmihalyi 1990). Ultimately, the line

between work and leisure is blurred as they become one whole, which is called life. The German word for experience, *Erlebnis*, is related to the verb *to live* (Schmitt 1999). Flow experience has been reported in many areas such as rock climbing, chess playing, dancing, surgery, sports, arts, music compositions, and management, to name a few (Csikszentmihalyi 1990, 2000). Studies that have utilized or dealt with flow theory in information systems and marketing are listed in Table 3.

Table 3. Sample of Studies Dealing with Flow Experience

Field/Study	Relevant Findings
Information Systems	
Agrawal and Karahanna 2000	Cognitive absorption dimensions are temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity.
Chen et al. 1999	Flow is important in improving web site design. Flow includes challenges, control, and feelings of enjoyment.
Jennings 2002	In entertainment and games, in this case an interactive science murder mystery, users achieve a state of flow.
Koufaris 2002	Shopping enjoyment and perceived usefulness of a site are predictors of revisits.
Skadberg and Kimmel 2004	Interactivity and site attractiveness impact flow experience, which allows for greater user learning. Users report sensing time distortion, enjoyment, and telepresence while browsing.
Trevino and Webster 1992	Four flow measures are control, attention focus, curiosity (sensory and cognitive), and intrinsic interest, as examined in work settings using email and voice mail.
Webster et al. 1993	12-item flow scale, based on Trevino and Webster (1992), suggests 3 dimensions, combining curiosity and intrinsic interest into one dimension, *cognitive enjoyment*.
Webster and Martocchio 1992	Computer or cognitive playfulness, involving spontaneous and imaginative interactions with computers, is important in IS.
Marketing	
Hoffman and Novak 1996	They propose a model that is later revised into Hoffman and Novak's Model of Flow (2000).
Novak et al. 2000	Revised model shows skill and control, challenge and arousal, focused attention, and interactivity and telepresence increase flow.
Schmitt 1999, 2003	Flow is relevant to sensory, affective, and cognitive experiences.

After a flow experience, the self becomes more complex in two ways: differentiation and integration (Csikszentmihalyi 1990). *Differentiation* is a sense of being unique and different from other people. On the contrary, *integration* is a union

with others, ideas, and entities outside the individual. In the context of eshopping, customization and personalization of a web site is an example of differentiation, and communication with online users in chat rooms and via egroups connected by a common interest is an example of integration.

The Internet facilitates a flow experience (Chen et al. 1999; Novak et al. 2000, 2003), and online activities resulting in flow can be classified as the virtual environment itself, newsgroup discussions, chat rooms, email, and computer games (Chen et al. 1999). Eshopping experience, in such contexts as web surfing, eshopping, and playing online computer games, exhibits flow preconditions and characteristics. When users go online, they may have a *clear goal*, such as searching for information on a product or purchasing that item online, and receive *feedback* when the system responds to their search inquiry. They may also entertain themselves through leisurely browsing a site or playing a game with other users on the web. These tasks pose *challenges* and require Internet *skills* to complete them. In essence, users are *carrying out those actions* and *concentrating* on what they are doing. Higher challenge induces increased focused attention online (Novak et al. 2000). The users are in *control* of the interface and level of interactivity and manipulate various objects and controls, like buttons and vivid 3D simulations. Experiencing other interactivity features, they customize products to their liking and personalize the experience through user profiles. In interactive 3D games or product simulations, they feel so absorbed in their activities (Swartout and Van Lent 2003) that they may *lose self-consciousness* and *lose track of time.* While browsing in a virtual environment and undergoing this sensory, affective, and cognitive experience, users feel time distortion, enjoyment, and telepresence, and in turn experience flow (Skadberg and Kimmel 2004). Those feelings are a consequence of being transported into a virtual world of fantastic games or 3D dressing rooms with virtual models of users or virtual dressing rooms, such as the case with landsend.com and eddiebauer.com. These experiences of online navigation and playing computer games (Jennings 2002) become *autotelic* when individuals carry out those activities for their own sake, which is

increasingly likely as they have good experiences and experience flow. Characteristics of flow are shown in Table 4 (Csikszentmihalyi and Rathunde 1993).

Table 4. Flow Experience Characteristics (Csikszentmihalyi and Rathunde 1993)

Dimension	Details
Clear goals	Task at hand is clear and has *immediate feedback.*
Challenges = skills	Opportunities to act are high, along with one's perceived ability to act.
Merge of action and awareness	One-pointedness of mind: feelings of total involvement that individuals stop being aware of themselves as separate from the action performed.
Concentration on task at hand	Extraneous input is ignored as worries and concerns are suspended for the time being.
Control	There is a perceived sense of control.
Loss of self-consciousness	Transcendent feelings of belonging to something of greater importance.
Altered sense of time	Sense of time going by faster.
Autotelic experience	When several of the prior conditions exist, the experience is worth the effort just for its own sake.

Summary of Flow as a Multidimensional Construct

Flow is a multidimensional construct with three dimensions: control, attention focus, and cognitive enjoyment (Webster et al. 1993). Control is the experience of user influence over and ability to manipulate the computer interaction, resulting from the system's response to user commands or choices among alternatives (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993). Attention focus is a condition in which individuals are so absorbed or engaged in an activity that they might be oblivious to the world around them, filtering out impertinent stimulus (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993). Cognitive enjoyment is the combination of curiosity and intrinsic interest (Webster et al. 1993). Curiosity is stimulated through new and fun ways to interact with a site. Intrinsic interest is carrying out a task just for its own sake or enjoyment.

Relationship of Eshopping Experience, Flow, and Consequences

Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively. Csikszentmihalyi (2000) views the aggregation of sensations, emotions, and cognitions as a complete experience, leading potentially to a flow experience. Compelling online experiences are highly related to fun and experiential uses of the web and negatively correlated with task-oriented or utilitarian uses of the Internet (Novak et al. 2000). The user experience reaches a state of flow as users have a goal, concentrate on their task or fun objective, lose sense of time, and execute an activity just for its own sake. Webster et al. (1994) show that flow has both cognitive and affective components since users experience control, attention focus, and cognitive enjoyment (a combination of curiosity and intrinsic interest) while interacting with computers.

Consequently, flow experience results in changes in attitudes (Trevino and Webster 1992). While users are in a flow state, they are more inclined to learn about the content of a site, and this learning results in further attitudinal and behavioral changes, such positive site attitudes and revisits (Skadberg and Kimmel 2004). These feelings of enjoyment and concentration (characteristics of a flow experience) in shopping leads to an increased likelihood of return visits to a web site and changes in behavior, such as purchase intentions (Koufaris 2002).

Consequences of Eshopping

This section defines the consequences of eshopping, future purchase intentions and site attitude, as well as discusses the theory of reasoned action and technology acceptance model. The main relevant theory of the present study is flow theory (Csikszentmihalyi 1975, 1990, 2000). However, since the research model examines the

direct and indirect relationships between eshopping behavior, site attitude, and future purchase intentions, it is pertinent to discuss two other theories that postulate attitude-intention-behavior relationships: the theory of reasoned action and technology acceptance model. In addition, further references to these two theories become pertinent in the *Analysis of Data and Results* and *Conclusion* chapters.

Theory of Reasoned Action and Technology Acceptance Model

The theory of reasoned action or TRA (Fishbein 1967; Fishbein and Ajzen 1975) tries to explain the linkage between attitude and behavior. The influence of attitude towards an actual behavior happens as consciously intended (Davis et al. 1989) or *reasoned* action through the mediating effect of behavioral intention. This mediating effect between attitude and behavior is also called the *sufficiency assumption* (Bettman 1986). It is more significant to consider users' attitude towards purchasing or using a product than their attitude towards the object or brand itself in predicting their behavior of purchase intention (Fishbein 1967; Fishbein and Ajzen 1975). For example, a customer may have a favorable attitude towards a very powerful Dell computer system but an unfavorable attitude toward purchasing it due to cost (modified example from Assael 1998). The theory was later modified to incorporate beliefs (evaluations of action) and social norms. Evaluations of action are a person's beliefs about perceived consequences of one's actions. Social norms are a combination of normative beliefs (perceived expectations of one's family and peers) and motivation to comply with these expectations. TRA is depicted graphically in Figure 3 (Fishbein 1967; Fishbein and Ajzen 1975).

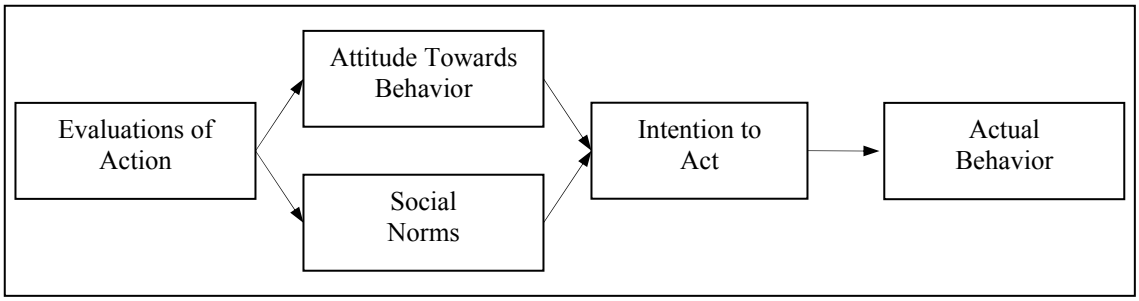

Figure 3. Theory of Reasoned Action (Fishbein 1967; Fishbein and Ajzen 1975)

Based on the theory of reasoned action, the technology acceptance model or TAM (Davis 1989; Davis et al. 1989) is a theory that explains user adoption of technology at the organizational level. It is one of the most widely used theories in IS literature. The theory establishes a chain of causality of beliefs about the technology, attitudes towards using the technology, behavioral intentions of use of the system, and behaviors or actual usage of the technology (Heijden et al. 2003), as shown in Figure 4 (Davis 1989; Davis et al. 1989). According to the theory, two beliefs (perceived usefulness and perceived ease of use) predict attitudes, which in turn influence intended use of a technology. This intention then consequently impacts behavior of actual system usage. Perceived usefulness is the degree to which a user thinks a technology would enhance performance or productivity in the workplace. Perceived ease of use is the degree of lack of effort required by the user in adopting a given technology. Perceived ease of use also affects perceived usefulness.

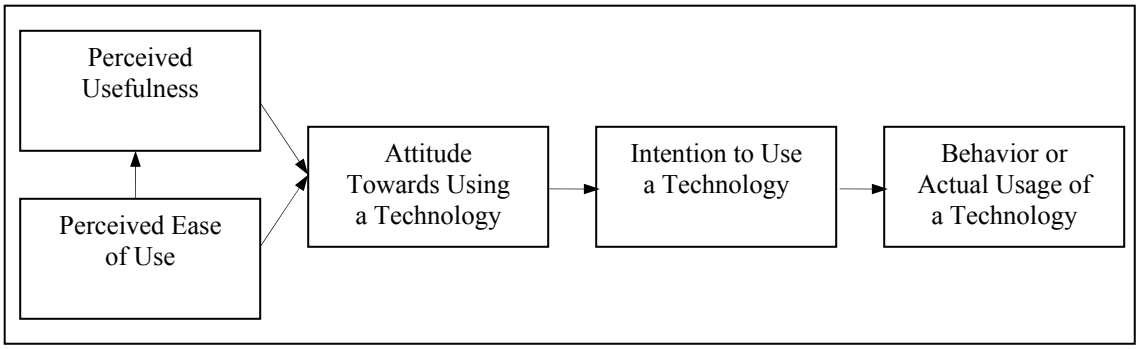

Figure 4. Technology Acceptance Model (Davis 1989; Davis et al. 1989)

Future Purchase Intentions

Future purchase intentions are the likelihood that a user will buy in the future a product online while shopping. This measure is important to ecommerce sites since they are concerned if customers intend to spend money, as this impacts the site's bottom line.

Seventy-one percent of users report that their latest online purchase is planned, and twenty-nine percent of customers acknowledge their purchase was a result of simply browsing and navigating (Wolfinbarger and Gilly 2001). Hence, online stores should cater to both experiential and utilitarian needs of eshoppers (Koufaris 2002), as this may impact their purchase intentions after navigating the site. Increased levels of interactivity are related to positive attitudes towards a web site (Coyle and Thorson 2001; Teo et al. 2003), and these user attitudes affect purchase intentions (Jee and Lee 2002).

The use of interactive features in landsend.com, such as *My Virtual Model, Lands' End Custom Clothing*, and *My Personal Shopper* results in increased sales (Guay 2001). In a comparative study, customers who used the model were 19% more inclined to purchase items than those who did not use the model (Guay 2001). Between October 2001 and September 2002, 40% of customer traffic on the site was for custom-made chinos and jeans (Ives and Piccoli 2003). *My Personal Shopper* feature results in an average of 10% increase in ticket orders (Haeberle 2002).

Site Attitude

Site attitude, or attitude towards the site, is the user's positive or negative predisposition toward a web site. When users have a positive site attitude, they may be more inclined to revisit the site, recommend it to friends and family, and ultimately intend to purchase goods and services from the site (Agrawal and Karahanna 2001; Childers et al. 2001; Koufaris 2002; Skadberg and Kimmel 2004).

Increased levels of interactivity result in positive attitudes towards a web site (Coyle and Thorson 2001; Teo et al. 2003), and these user attitudes affect purchase intentions (Jee and Lee 2002). While users are in a flow state, they are more inclined to learn about the content of a site, and this learning results in attitudinal and behavioral changes, such positive site attitudes and revisits (Skadberg and Kimmel 2004).

CHAPTER III

RESEARCH MODEL FRAMEWORK

This chapter describes the research framework in terms of its research model and research hypotheses.

Research Model

The research model and hypotheses are shown in Figure 5.

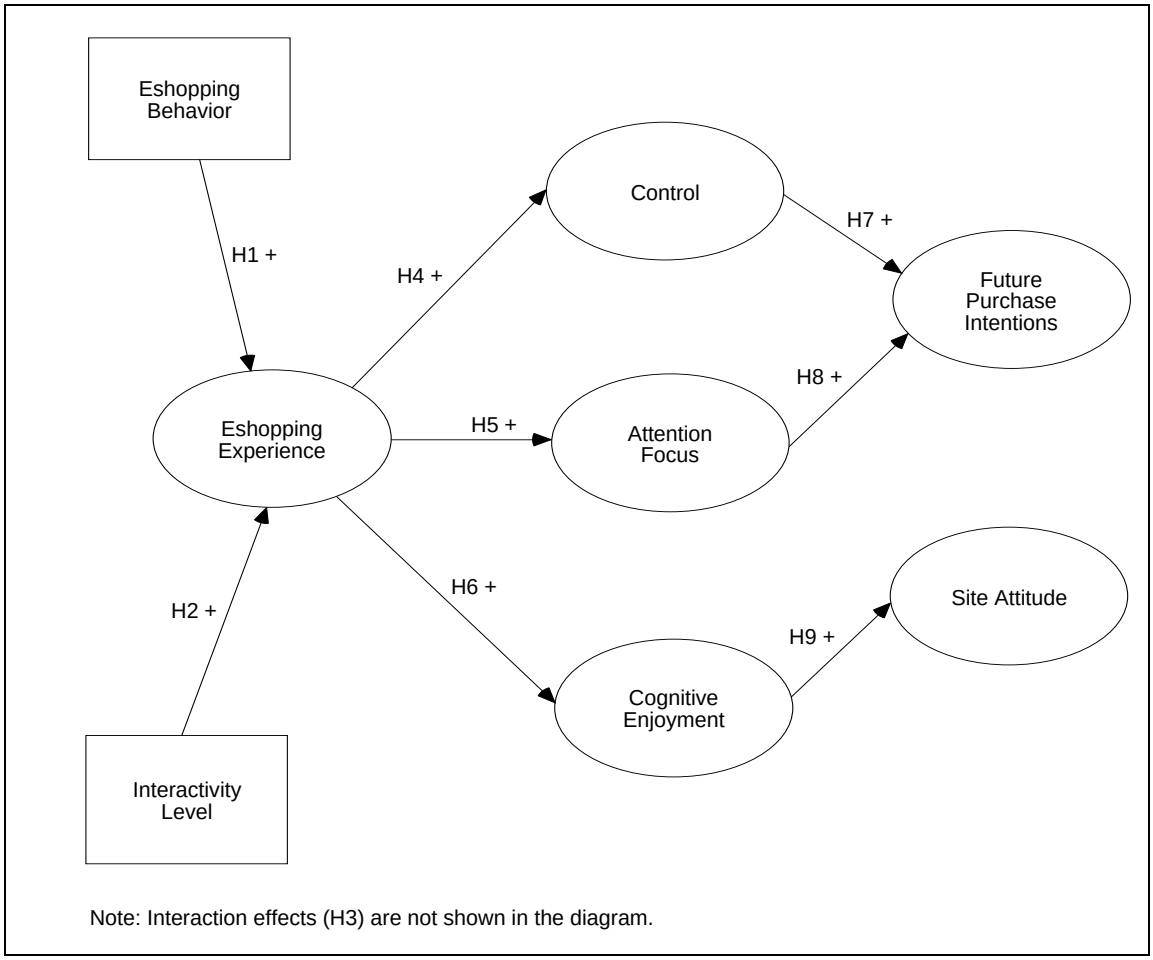

Figure 5. Research Model

Table 5. Definitions of the Research Model Constructs

Type/Construct	Definition
Exogenous Variables	
1. Eshopping Behavior	• The way users shop online; it is classified as *experiential, utilitarian* (Assael 1998; Hoffman and Novak 1996; Holbrook and Hirschman 1982; Nielsen 2000; Novak et al. 2000, 2003), or *mixed*. • Experiential: eshopping for fun and entertainment • Utilitarian: eshopping for a specific purpose or goal • Mixed: exhibiting both experiential and utilitarian eshopping qualities
2. Interactivity Level	• Direct communication and involvement between users and the system interface in order to change and customize a web site's look, feel, content (Palmer 2002; Zhu and Kraemer 2002), and the site's product offerings, according to users' personal preferences. It has two levels: *low* and *high.* • Low Level: interactivity that uses two elements: *textual* and *graphical* • *Textual*: text descriptions of products and their information (e.g. size) • *Graphical*: static 2D images of a product or item • High Level: interactivity that includes the low interactivity level elements (textual and graphical) and expands beyond those elements to include *media vividness*, *customization*, and *personalization* • *Media Vividness*: the degree of media richness in a site, such as text, images, sound, video, and 3D simulations • *Customization*: the ability that permits users to make unique interface changes to create individual user experiences through tailor-made products and services • *Personalization*: the ability of a web site to track users' information and preferences using user profiles to offer individualized greetings, suggestions, and information on relevant items that create a unique user interface (Thorbjornsen et al. 2002; Zhu and Kraemer 2002)
Endogenous (Mediating) Variables	
1. Eshopping Experience	• The event that users go through with a web site's product offerings while shopping online and encompasses their *sensory, affective,* and *cognitive* participation (Schmitt 1999, 2003). However, it is a unidimensional construct, based on second-order factor analysis of Schmitt's (1999) scale.
2. Control	• An element of flow, it is the experience of user influence over and ability to manipulate the computer interaction, resulting from the system's response to user commands or choices among alternatives (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993).
3. Attention Focus	• A component of flow, it is a condition in which individuals are so absorbed or engaged in an activity that they might be oblivious to the world around them, filtering out impertinent stimulus (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993).
4. Cognitive Enjoyment	• A dimension of flow (Csikszentmihalyi 1975, 1990, 2000), it is the combination of *curiosity* and *intrinsic interest* (Webster et al. 1993). Curiosity is stimulated through new and fun ways to interact with a site. Intrinsic interest is carrying out a task just for its own sake or enjoyment.
Endogenous (Outcome) Variables	
1. Purchase Intentions	• The likelihood that a user will buy a product online while shopping
2. Site Attitude	• Attitude towards the site or the user's positive or negative predisposition toward a web site

The research model has two exogenous variables: eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high). The endogenous (mediating) variables are eshopping experience, control, attention focus, and cognitive enjoyment. The endogenous (outcome) variables are future purchase intentions and site attitude. The study's research model is shown on page 30, and definitions of variables are shown in Table 5 on page 31.

Research Hypotheses

There are three main sets of hypotheses. The first set examines the main effects of eshopping behavior and interactivity level on eshopping experience, followed by their interaction effects. The second set explores the effects of the eshopping experience on flow experience. Finally, the third set of hypotheses handles the effects of flow experience on consequences of eshopping.

Behavior and Interactivity Effects on Eshopping Experience

First, the main effects of each of eshopping behavior and interactivity level on eshopping experience are presented. This is followed by their interaction effects.

Main Effect of Eshopping Behavior on Eshopping Experience

It is hypothesized that eshopping behavior affects the eshopping experience in such a way that mixed eshoppers will have the best overall experience, experiential eshoppers the next best, and utilitarian eshoppers the worst overall experience. This overall experience is a combination of sensory, affective, and cognitive dimensions.

Navigating a web site experientially for fun and entertainment as opposed to utilitarian reasons induces experiential users to sense and think about a site in a more positive way and hence positively affects their sensory, affective, and cognitive eshopping experiences (Schmitt 1999, 2003). Experiential eshoppers prefer symbolic messages and imagery as a part of the sensory eshopping experience, in comparison to utilitarian eshoppers who gravitate towards product information (Assael 1998). Experiential eshopping behavior creates a more positive mood and a greater affective

eshopping experience that may result in more impulse buying (Wolfinbarger and Gilly 2001).

Utilitarian users are more interested in achieving their goal of product information search or purchase and are likely to be less interested in spending time in exploratory behavior like experiential users (cognitive experience), are less likely to be affected by imagery or site features (sensory experience), or be too concerned with how a web site puts them in certain mood (affective experience). Hence, utilitarian eshoppers would have the lowest overall eshopping experience. Exploratory behavior, such as trying on new interactive features in software or a web site, results in cognitive stimulation (Webster and Martocchio 1992).

Mixed eshoppers combine the best of both worlds, surpassing both experiential and utilitarian users in the eshopping experience. Mixed eshoppers shop for entertainment and fun (experiential qualities) but have a purpose or a goal in mind (utilitarian characteristics), such as purchasing products and services. Mixed eshoppers have the best overall eshopping experience, a combination of sensory, affective, and cognitive eshopping experiences. Therefore, the following research hypotheses are posited:

H1: Eshopping behavior affects eshopping experience.

H1a: Mixed eshopping behavior increases the eshopping experience more than experiential eshopping behavior does.

H1b: Experiential eshopping behavior increases the eshopping experience more than utilitarian eshopping behavior does.

Main Effect of Interactivity Level on Eshopping Experience

Highly interactive sites create increased sensory, affective, and cognitive eshopping experiences than low interactive sites do. This results in an increased overall level of the eshopping experience, a combination of all three types. In essence, highly interactive features (versus low interactive features) induce users to sense and think about a site in a more positive way and hence affects their sensory, affective, and

cognitive eshopping experiences (Schmitt 1999, 2003). For example, visual stimulation as part of a sensory experience in highly interactive 3D images results in more enjoyable eshopping (Li et al. 2001). Increased levels of interactive features in a web site create a positive feeling and attitude towards a web site, resulting in a greater affective eshopping experience (Coyle and Thorson 2001; Teo et al. 2003). Due to its requirement of user attention and concentration, high interactivity involves more cognitive processing in the brain in comparison to traditional media or low interactive online experiences, resulting in a greater cognitive eshopping experience (Liu and Shrum 2002). It is posited that high interactivity level in a web site enhances the overall eshopping experience, an aggregate of sensory, affective, and cognitive experiences. Thus, the following hypothesis is postulated:

> H2: High interactivity level web sites increase eshopping experience more than low interactivity level websites do.

Interaction Effects

Regarding the interaction effects of eshopping behavior and interactivity level on eshopping experience, there are six groups or cells given the various levels of each of the two exogenous variables: eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high). It is hypothesized that mixed eshopping behavior and high interactivity level web sites result in the highest levels of eshopping experience (sensory, affective, and cognitive). The next two groups, representing the most polarized interaction effects, (experiential and high) and (utilitarian and low) will have equal and higher eshopping experiences than the remaining groups.

As hypothesized in H1 and H2 above, mixed eshoppers combine the best of both worlds of experiential and utilitarian eshopping behavior. More receptive to imagery and sensory stimulation (Assael 1998) of the web site design and features, experiential eshoppers may spend more time in exploratory behavior (Webster and Martocchio 1992) for fun and entertainment and may try on more interactive features in a web site during their exploration. Experiential users report higher levels of arousal and pleasure

(affective eshopping experience) in comparison to utilitarian users (Babin et al. 1994). On the other hand, utilitarian eshoppers feel disappointment if they do not accomplish their shopping goal (Babin et al. 1994). In addition, highly interactive features, such as 3D simulations, enhance the eshopping experience through visual stimulation (sensory eshopping experience) and create more emotional and cognitive activities than 2D does (Li et al. 2002). Since utilitarian users are more interested in accomplishing their goal or product search and purchase over exploratory behavior, they are likely to try less of the interactive features in a site, because they are likely to regard them as distractions that slow goal attainment. Hence, they are expected to prefer low interactive sites that minimize their time spent eshopping and maximize their efficiency. Compelling online experiences are correlated highly with fun and experiential use of the web and negatively correlated with task-oriented or utilitarian uses of the Internet (Novak et al. 2000). Hence, the following hypotheses show these interaction effects.

> H3: There is an interaction effect between eshopping behavior and interactivity level on eshopping experience.
>
> H3a: *Mixed* users using *high* interactivity level web sites have greater eshopping experience than any other group, including mixed users using low interactivity level web sites, experiential users using high interactivity level web sites, or utilitarian users using low interactivity level web sites.
>
> H3b: *Experiential* users using *high* interactivity level web sites have greater eshopping experience than mixed users do while using low interactivity level web sites, experiential users do while using low interactivity level web sites, or utilitarian users do while using high interactivity level web sites.
>
> H3c: *Utilitarian* users using *low* interactivity level web sites have greater eshopping experience than mixed users do while using low interactivity level web sites, experiential users do while using low interactivity level web sites, or utilitarian users do while using high interactivity level web sites.

Eshopping Experience Effects on Flow Experience

As users undergo eshopping experiences (sensory, affective, and cognitive) while navigating a web site, they are concentrating on and being immersed in their eshopping. The interface of a web site in rich 3D media stimulates the users' sensory experience while shopping online (Li et al. 2001). Both affective and cognitive computer interactions lead to flow, in terms of control, attention focus, and cognitive engagement (a combination of curiosity and intrinsic interest) (Webster et al. 1994). Getting immediate feedback when they find items of interest (Csikszentmihalyi 2000), users feel satisfied that they find items they are looking for. In addition, flow includes feelings of control and enjoyment (Chen et al. 1999).

Combining sensory, affective, and cognitive dimensions into a holistic experience, eshopping experience may converge into one aggregate experience for the consumer (Schmitt 1999, 2003). This occurs when users are highly stimulated with sensory, affective, and cognitive stimuli, such as with 3D interactive features (Li et al. 2002), with positive moods a site puts them in (Babin et al. 1994), or with exploratory behavior of the site (Webster and Martocchio 1992), respectively. The integration of sensations, emotions, and cognitions into a complete experience can lead to a flow experience (Csikszentmihalyi 2000), as the Internet allows for a flow experience (Chen et al. 1999; Novak et al. 2000, 2003). Users achieve flow as they are concentrating on their shopping and oblivious to their surroundings (attention focus), enjoy their online activities by fulfilling their curiosity of trying on new features of the web site or simply eshopping for its own sake (cognitive enjoyment), and have control over the interaction through browsing the site (control). The sensory and cognitive experiences of online users are heightened in a state of flow (Agarwal and Karahanna 2001; Novak et al. 2000). Based on this literature, the relevant hypotheses to be examined in terms of the overall eshopping experience are the following:

> H4: Eshopping experience is positively related to the control dimension of flow.

H5: Eshopping experience is positively related to the attention focus element of flow.

H6: Eshopping experience is positively related to the cognitive enjoyment component of flow.

Flow Experience Effects on Consequences of Eshopping

After achieving a state of flow, users are engaged in their eshopping and visiting the web site. During this flow state, there are heightened sensory and cognitive experiences (Trevino and Webster 1992). These complete, holistic experiences impact attitudes (Trevino and Webster 1992).

Users feel control over the interaction with the site as the system provides feedback to their commands and responses to their choices of different alternative actions in the course of browsing the site, including personalized encounters, responses to search queries about products and services. Consequently, users while shopping may formulate a positive attitude towards the site or intend to purchase an item from a site in the future. This occurs since feelings of shopping enjoyment and concentration (important attributes of a flow experience) lead to increased likelihood of return visits to a web site and changes in behavior, such as purchase intentions (Koufaris 2002). While users are in this flow state, they are more likely to learn about the content of the site, and this learning results in changes in attitudes and behaviors, such as positive site attitudes and revisits (Skadberg and Kimmel 2004). (Cognitive) enjoyment is a significantly positive predictor of attitude toward online shopping (Childers et al. 2001). Cognitive absorption, a construct based on flow dimensions such as control, curiosity, attention, and heightened enjoyment among others, is a significant predictor of attitudes (perceived usefulness and perceived ease of use of a technology) (Agrawal and Karahanna 2001). This supporting literature suggests the following hypotheses:

H7: The control dimension of flow increases the likelihood of users' future purchase intentions of a product online.

H8: The attention focus component of flow increases the likelihood of users' future purchase intentions of a product online.

H9: The cognitive enjoyment element of flow increases positive web site attitude.

In conclusion, the study's research model shows the aforementioned research hypotheses, which specify the expected relationships in the model, as shown on page 30.

CHAPTER IV

RESEARCH DESIGN AND METHODOLOGY

This chapter covers an overview of the methods, research design and procedures, an assessment of reliability and validity of measures, and analytical methods for testing the model and hypotheses.

Overview of Methods

Structural equation modeling (SEM) and multivariate analysis of variance (MANOVA) were used for data analysis. An experimental design was utilized and was best to test the model. This design is advantageous since it facilitated random assignments and control over the independent variables, increasing internal validity (Benbasat 1989; Montgomery 2001). The subjects were randomly assigned to each group or treatment. The laboratory setting allowed for tight control over the independent variables and minimized extraneous distractions to the subjects.

The exogenous variables in the model are eshopping behavior and interactivity level. The endogenous (mediating) variables are eshopping experience, control, attention focus, and cognitive enjoyment. The endogenous (outcome) variables are the consequences of eshopping: future purchase intentions and site attitude.

Research Design and Procedures

This section describes the experimental design and independent (exogenous) variables, experimental procedures, and measurement of endogenous variables.

Experimental Design and Exogenous Variables

	Interactivity Level	
Eshopping Behavior	Low	High
Experiential	*n* = 36	*n* = 35
Utilitarian	*n* = 41	*n* = 38
Mixed	*n* = 89	*n* = 71

Figure 6. Experimental Design

A laboratory experiment was conducted. The experimental design was a randomized complete block design (Keppel 1991; Montgomery 2001), as shown in Figure 6. The advantages of the blocked design include ease of comparison of treatments given *one* extraneous source of variability (*i.e.* the blocking variable), simplicity of data analysis, convenience of design construction, and ease of accommodation of multiple treatments in numerous blocks (Ott 1993, p. 846). There were two exogenous variables: eshopping behavior (experiential, utilitarian, or mixed) and interactivity level (low or high). Hence, there were six groups or cells. Subjects filled out a questionnaire that enabled the determination of their eshopping behavior as experiential, utilitarian, or mixed and was used to assign them to the appropriate condition. Therefore, eshopping behavior was the blocking variable. The experimental units or subjects were randomly assigned to either a low or high interactivity level treatment. In the blocked design, the differences among eshopping behaviors had been *blocked* to arrive at an accurate comparison of the two interactivity level treatments (Ott 1993, p. 26). In this design, all treatments were assigned in each block; hence, it was a *complete* block design. There were 166 subjects in the low interactivity level treatment and 144 subjects in the high interactivity level treatment.

There are two exogenous (independent) variables, eshopping behavior and interactivity level. The method of manipulating them will be described in the following sections, followed by a discussion of the subjects.

Eshopping Behavior: Experiential, Utilitarian, or Mixed

Eshopping behavior had three levels: experiential, utilitarian, and mixed. The three-group case was used in the present study since it seemed more realistic over the dichotomous two-group case of absolute black and white classifications into experiential and utilitarian categories. The full spectrum of consumer behavior includes a mixed case and not just the polarized, binary twofold categorization. Experiential users like to shop for fun and entertainment, while utilitarian users are goal-oriented and have a specific purpose in mind, such as purchasing an item. Mixed users exhibit both experiential and utilitarian qualities.

Subjects were assigned to the one of three categories based on their responses on the Babin et al. (1994) fifteen-item personal shopping value scale. Babin et al.'s (1994) scale appears in the appendix. A copy of the actual questionnaire (with randomized questions and eshopping task instructions, given to subjects) appears in Appendix A on page 146. The instrument of the present study, with scale items grouped under their respective constructs, is shown in Appendix B on page 170.

A classification algorithm was developed to assign subjects to the three eshopping behavior groups, based on the experiential and utilitarian scale scores for each subject. The algorithm simply assigned subjects to a particular group if they scored *highly* on the scale for that group and low on the other group's scale. The definition of a high score is explained with an example below.

As an illustration, after each subject filled out Babin et al.'s (1994) scale, there were two sets of scores for both the experiential and utilitarian scales for each subject. (These were standardized scores with a zero mean and a unit standard deviation). A composite mean score for a subject's score on each scale was calculated. If the mean scores on both scale were equal, the subject was assigned as mixed. However, for

example, if the average on the experiential score was higher than the utilitarian score, then the subject is not a utilitarian eshopper but could be either experiential or mixed. The subject was assigned as experiential (if their score was very high, *i.e.* above the cutoff point for the experiential classification). In this example, this cutoff point was defined as the value that is at least one standard deviation above the average experiential score for all subjects. The cutoff point of having scores be at least one standard deviation meant the subject exhibited a high score on the continuum for that particular group's distribution (in this case, the experiential distribution). On the other hand, if the experiential score for the subject in this example was within less than one standard deviation, the individual was assigned as mixed, since the subject scored low enough on the experiential scale that the subject could not be classified as experiential. (Previously, it was shown that the subject could not be utilitarian either since the utilitarian score was less than the experiential score for the subject.) The algorithm is shown in Figure 7.

```
avgExp(i) = mean score of the experiential scale items for subject(i)
avgUtil(i) = mean score of the utilitarian scale items for subject(i)
stddevExp = standard deviation of the scores of the experiential scale items for all subjects
stddevUtil = standard deviation of the scores of the utilitarian scale items for all subjects

IF avgExp(i) <> avgUtil(i)
    IF avgExp(i) >= avgUtil(i)
        IF avgExp(i) >= stddevExp
            Experiential
        ELSE
            Mixed
    ELSE
        IF avgUtil(i) >= stddevUtil
            Utilitarian
        ELSE
            Mixed
ELSE
    Mixed

The algorithm uses standardized scores with a zero mean and a unit standard deviation.
```

Figure 7. Classification Algorithm for the Eshopping Behavior Groups

The distribution of the three eshopping behavior groups is shown in Table 6. It shows a breakdown of the distribution by gender for each group. The mixed group represented the largest proportion of the sample (52%) followed by utilitarian (25%) and experiential (23%). Within each group, females accounted for roughly two-thirds of their respective groups. Genders were proportionately the same in the groups as in the sample as a whole, as reported below on page 48.

Table 6. Distribution of Eshopping Behavior Groups

Group	Frequency	Proportion of Sample (%)
Experiential	71	23
Male	17	5
Female	54	17
Utilitarian	79	25
Male	33	11
Female	46	15
Mixed	160	52
Male	65	21
Female	95	31
Total	310	100

Interactivity Level: Low or High

The second exogenous variable is interactivity level in the web site, with two levels: low and high. The web site is landsend.com, a major online retail clothing vendor, that sells apparel for women, men, and children, either off-the-shelf or custom-tailored; luggage; and products for the home. Landsend.com was a suitable setting for the study as it has a highly interactive site, with features needed in the study. In addition, landsend.com is a leading online retailer (Reda 2003) and the world's largest clothing site in terms of business volume (Comer 2003). The company was founded in 1963, and its web site was launched in 1995, which is a very long period for an etailer. It also has online presence in countries such as the United Kingdom, Japan, Germany, Italy, France, and Ireland (Comer 2003). Between a three-year period from 1999 to 2002,

landsend.com online sales increased from $61 million to $299 million (Ives and Piccoli 2003).

Several features make the landsend.com site interactive, such as *My Virtual Model, Lands' End Custom Clothing,* and *My Personal Shopper,* corresponding to the high interactivity level features: media vividness, customization, and personalization, respectively. These interactive features made landsend.com an ideal site for the present study. To give an example of the effectiveness of these features, *My Virtual Model*, *Lands' End Custom Clothing,* and *My Personal Shopper* are discussed below in more detail.

First, launched in 1998, *My Virtual Model* feature gives customers the ability to build their own likeness virtually, based on their measurements, body type, and physique, and to try on clothes virtually (Guay 2001). As a measure of success, data were gathered during a four-week period in November 2000 and compared with similar data in January 2001, showing two positive results (Guay 2001). The first result is that using the model resulted in an increase of 16% in order values, in comparison with those orders not using the model. Second, customers who used the model were 19% more inclined to purchase items than those who did not use the model. Thirteen percent of landsend.com customers take advantage of the virtual model feature, and the conversion rate (or the rate at which customers switch to an alternative item or recommendation made by the site) for those who used the model was 34% greater than those who did not, resulting in a 7% hike in order value (Haeberle 2002).

Second, through the *Lands' End Custom Clothing* feature, made-to-order clothing on landsend.com began October 2001 with the introduction of tailor-made chinos; and in April 2002, the introduction of custom-made jeans followed (Haeberle 2002). Between October 2001 and September 2002, 40% of customer traffic on the site was for custom-made chinos and jeans, with 20% of those customers making their first online purchase ever (Ives and Piccoli 2003). An added benefit, custom-fitted clothing resulted in lower return rates for landsend.com (Haeberle 2002).

Third, suggesting products based on user preferences and lifestyles, *My Personal Shopper* feature resulted in an 80% conversion rate and an average of 10% increase in ticket orders (Haeberle 2002). Conversion rate is the rate at which customers switch to an alternative item or recommendation made by the site.

The manipulation of using landsend.com site for both low and high interactivity levels was done without building or using a second low interactive web site to minimize the possibility that extraneous or confounding factors, such as brand recognition, are introduced in the study. Had a second web site been built or used with a fictitious brand name, then it would have been difficult to determine if results were due to its low interactive features or difference in brand name. Using just one site allowed for more control. To increase control, subjects were instructed to follow directions explicitly. Second, a computer program, Camtasia Recorder (techsmith.com), generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. These files were later examined to make sure subjects followed instructions and stayed within the proper treatment of their interactivity level. If they did not follow directions, their data were dropped from the study.

The low and high levels of interactivity were defined in terms of the following dimensions and their corresponding landsend.com features: textual elements, graphical elements, media vividness, customization, and personalization, as shown in Table 7.

Table 7. Comparison of Low and High Interactivity Levels

	Interactivity Level		
Interactivity Dimension	**Low**	**High**	**Corresponding Landsend.com Feature**
Textual Elements	Yes	Yes	Product Descriptions
Graphical Elements	Yes	Yes	Product Images
Media Vividness	2D	3D	*My Virtual Model*
Customization	None	Yes	*Lands' End Custom Clothing*
Personalization	None	Yes	*My Personal Shopper*

Landsend.com was used in the study in two different ways to correspond to the low and high levels of interactivity, as shown in Table 7 and Table 8. *The low interactivity level* version of the site allowed subjects to navigate landsend.com to search for one item of clothing, using textual and graphical elements of the site only without utilizing more advanced interactive features. The *textual elements* are product information or descriptions in words, such as item name, item number, price, size, and color. *Graphical elements* are static 2D images of various clothing items. Hence, the low interactivity level is low in terms of media vividness and has no customization and personalization dimensions.

Table 8. Operationalization of Interactivity Level in Landsend.com

Interactivity Level	Element	Corresponding Landsend.com Feature
Low Level	Textual	Product information and descriptions in words
	Graphical	Static 2D product images
High Level	Same as Low	Textual and graphical elements
	Media Vividness	Media rich web site with 3D simulations. *My Virtual Model* represents physical characteristics of users**.**
	Customization	*Lands' End Custom Clothing* allows tailor-making of clothes.
	Personalization	*My Personal Shopper* recommends products matching users' preferences and styles.

The *high interactivity level* version of landsend.com allowed users to navigate the web site to search for one item of clothing, using the site's interactive features. The high interactivity level site included the low level elements (textual and graphical) but expanded to include media vividness, customization, and personalization. In landsend.com, vividness is evident through the use of rich 3D media, *My Virtual Model*, which reflects the customer's physical features and characteristics. *Lands' End Custom Clothing* permits users to tailor-make their own clothes. Personalization is achieved via *My Personal Shopper*, which recommends attire to suit the preferences and tastes of the customer.

Subjects

The subjects of the study were undergraduate college students in a southern university. They were taking an introductory management information systems class. They possessed basic web skills, necessary to browse the web. Participation in the study was voluntary, but subjects were given 15 points extra credit compensation for participation out of a possible 750 in the course, or 2%. Those who did not participate in or later withdraw from the study were able to carry out an equivalent homework task for extra credit that took the same time and effort and awarded the same 15 points of extra credit. The alternative homework required they do a one page write-up for an Internet research assignment to locate an article in a trade journal in the information systems field that discuss a new emerging technology.

The sample consisted of 310. The majority of the subjects were female, constituting 63% of the sample. Eighty percent of the subjects were between 19-21 years old. Ninety-seven percent were working on their bachelor's degree at the time of the study, and seventy percent used the Internet mainly for school. Sixty-seven percent of the subjects spent up to 19 hours weekly online. A total of 274 subjects or 88% of the sample had never visited landsend.com before participating in the present study. The profile and characteristics of the sample are shown in Table 9.

Table 9. Demographics of the Sample

Item	Frequency	Proportion of Sample (%)
Gender		
Male	115	37
Female	195	63
Age		
18 and under	6	2
19-21	247	80
22-24	50	16
25-27	6	2
28+	1	<1
Educational Level Sought		
High school		
Associate	9	3
Bachelor's	301	97
Master's		
Ph.D.		
Reasons for Using the Internet		
School	217	70
Shopping	6	2
Games	13	4
News	25	8
Other	49	16
Hours Online (Weekly)		
9 and under	100	32
10-19	116	37
20-29	72	23
30-39	13	4
40+	9	3
Prior Visit to the Web Site		
Yes	36	12
No	274	88

Note: $N = 310$.

Experimental Procedures

Laboratory Setting

The experiment took place in a computer lab. This allowed for tighter control and reduced distractions and interruptions. The room included 30 computers with a fast Internet connection running Microsoft Internet Explorer, version 6.0. Subjects navigated

landsend.com. Subjects sat in rows. For most of the time, there was one space of one unused computer between each subject.

Laboratory Procedures

The laboratory procedures involved several steps. The laboratory session procedures were consent form, steps for the session, questionnaire and eshopping task instructions given to subjects. These procedures appear in Appendix A on page 146

During the session, subjects received a session task packet consisting of a consent form and instructions. Once they had signed the consent form, the instructions directed them to the online questionnaire where they filled out the personal shopping value scale (Babin et al. 1994) to determine if their eshopping behavior was experiential, utilitarian, or mixed. They were then directed to a randomly assigned treatment web site (low or high interactivity level) and asked to navigate the web site and carry out the eshopping task. Finally, they filled out a follow-up questionnaire about their eshopping experience. Camtasia Recorder (techsmith.com) generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. Each session lasted for approximately one hour. The time frame, stages, and tasks of the laboratory session are shown in Table 10.

Table 10. Steps for the Laboratory Session

Duration	Stage	Tasks
15 minutes	Start-up	Give out the session task instructions Instruct subjects to sign the consent form Direct participants to fill out the personal shopping value scale
30 minutes	Task execution Site navigation	Instruct subjects to complete the eshopping task Answer questions if needed Direct subjects to navigate the web site and complete the task
15 minutes	Conclusion	Instruct participants to fill out the follow-up questionnaire Collect session task packets

Measurement of Endogenous Variables

There are two types of endogenous variables in the present study: mediating and outcome. The mediating variables are eshopping experience and flow experience, and the outcome variable is consequences of eshopping. Any variable other than the exogenous variables is an endogenous variable. Endogenous variables have straight, single-headed arrows that point to them (Hatcher 1994). They are explained within the system or model. Endogenous variables can be independent (antecedent to other endogenous variables) or dependent (consequent) variables.

Endogenous (Mediating) Variables

Eshopping experience, control, attention focus, and cognitive enjoyment are endogenous (mediating) variables. All scales are shown in Appendix B on page 170.

Eshopping Experience

Eshopping experience is defined as the event that users go through with a web site's product offerings while shopping online and encompasses their sensory, affective, and cognitive participation (Schmitt 1999, 2003). Schmitt's (1999) eshopping experience nine-item scale measured the eshopping experience.

Control

An element of flow, control is the experience of user influence over and ability to manipulate the computer interaction, resulting from the system's response to user commands or choices among alternatives (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993). Webster et al.'s (1993) three-item control scale measured this variable.

Attention Focus

A component of flow, attention focus is a condition in which individuals are so absorbed or engaged in an activity that they might be oblivious to the world around

them, filtering out impertinent stimulus (Csikszentmihalyi 1975, 1990, 2000; Webster et al. 1993). Webster et al.'s (1993) three-item attention focus scale measured this variable.

Cognitive Enjoyment

A dimension of flow (Csikszentmihalyi 1975, 1990, 2000), cognitive enjoyment is the combination of curiosity and intrinsic interest (Webster et al. 1993). Curiosity is stimulated through new and fun ways to interact with a site. Intrinsic interest is carrying out a task just for its own sake or enjoyment. Webster et al.'s (1993) six-item cognitive enjoyment scale measured this variable.

Endogenous (Outcome) Variables

The consequences of eshopping are two endogenous (outcome) variables: site attitude and future purchase intentions. All scales are shown in Appendix B on page 170.

Site Attitude

Site attitude, or attitude towards the site, is the user's belief about a web site in terms of a positive or a negative predisposition. Teo et al.'s (2003) three-item web user attitude scale measured this variable.

Future Purchase Intentions

Future purchase intentions are the likelihood that a user will purchase in the future an item online while shopping. Users are asked if they would buy an item of apparel from landsend.com to determine their purchase intention. Developed during the present study, the three-item future purchase intentions scale measured this variable.

Instrument

The instrument used in the present study with its various scales is shown in Appendix B on page 170. Each item had a seven-point Likert scale, with the following anchors: 1 = strongly disagree, 4 = neutral, and 7 = strongly agree. The various scales and their corresponding variables are shown in Table 11.

Table 11. Instrument Used in the Present Study

Scale	Variables
Subject demographics	Gender; age; educational level; reasons for using the Internet; time spent online; prior visit of the study's site
Personal shopping value (Babin et al. 1994)	Experiential, utilitarian, and mixed eshopping behaviors
Eshopping experience (Schmitt 1999)	Eshopping experience
Flow experience (Webster et al. 1993)	Control; attention focus; cognitive enjoyment
Consequences of eshopping	Future purchase intention; site attitude (Teo et al. 2003)
Manipulation checks	Interactivity scale (Palmer 2002; Srinivasan et al. 2002); checks on the consequences of eshopping

It is highly recommend that scholars use previously validated and reliable scales (Boudreau et al. 2001; Straub 1989; Straub et al. 2004). Reliability and validity measures were assessed in the present study for all scales, and results reported under their respective sections. All questions from the various scales were randomly ordered in the study instrument. A copy of the actual questionnaire (with randomized questions and eshopping task instructions, given to subjects) appears in Appendix A on page 146. The instrument of the present study, with scale items grouped under their respective constructs, is shown in Appendix B on page 170.

Assessment of Reliability and Validity of Measures

Assessment of the reliability and validity of the measures and statistical power and determination of minimum sample size are covered in this section.

Reliability of Measurement

Reliability is the extent to which an item, scale, or instrument will produce the same values when given in different times, places, or populations (Cronbach 1951; Garson 2002; Nunnally and Bernstein 1994). It is a measure of repeatability or replication. In the context of the present study, an overview of methods to enhance and evaluate reliability, as well as their reference sources in the literature, is presented in Table 12.

Table 12. Reliability Evaluation Methods for the Present Study

Reliability Measure/Recommended Method	References in the Literature
Use of existing instruments	Boudreau et al. 2001; Straub 1989; Straub et al. 2004
Pilot study use	
Comparison of consistency of results with the final study	
Internal consistency reliability	
Entire scale	
Calculation of & comparison of results for	
Cronbach's alpha	Cronbach 1951
Composite factor reliability	Werts et al. 1974
Individual scale items	
Calculation of item-total correlations	Calculations based on an illustration by Black (1993)
Calculation of indicator reliability	Bollen 1989; Long 1983

To achieve reliability, previously validated and reliable scales are used in the present study. It is highly recommended that researchers use previously validated and reliable scales in their studies (Boudreau et al. 2001; Straub 1989; Straub et al. 2004). In addition, a pilot study was conducted to assess the reliability of the scales and refine them.

Internal consistency reliability is the degree to which individual scale items correlate with one another or with the entire scale (Nunnally and Bernstein 1994). A scale in internally consistent if each item in a scale measures the same concept (Kline 1998). Calculations for two internal consistency indices for an entire scale: Cronbach's (1951) alpha and composite factor reliability (Werts et al. 1974) were run, and a comparison between the results of each was presented. In addition, item-total correlations, as well as indicator reliability (Bollen 1989, p. 221; Long 1983, p. 72), were calculated for each scale item or indicator variable. The calculations of the item-total correlations were based on an illustration by Black (1999, p. 280).

The most widely used index of internal consistency reliability is Cronbach's (1951) alpha or coefficient alpha. A calculation of Cronbach's alpha was used to assess the reliability of the study and was done in addition to stating the reported values for Cronbach's alpha in the literature for each corresponding scale, as shown in Table 13.

The conventional standard is that Cronbach's alpha should be .70 or higher for a scale to be considered reliable (Garson 2002; Nunnally and Bernstein 1994). In addition, calculations were run to test the composite factor reliability (Werts et al. 1974) of the measurement model resulting from confirmatory factor analysis and compared to the results against Cronbach's alpha. Indicator reliability (Bollen 1989, p. 221; Long 1983, p. 72) and item-total correlations were also evaluated for each individual scale item. Details of the analysis are presented on 83.

Table 13. Cronbach's Alpha of the Scales as Reported in the Literature

Scale	Reported In the Literature
Babin et al.'s (1994) personal shopping value	.93
Schmitt's (1999) eshopping experience	.85
Webster et al.'s (1993) flow experience	.82
Consequences of eshopping scale	N/A

Validity of Measurement

Validity of measurement includes construct validity. Construct validity includes factorial, convergent, and discriminant validity. In the context of the present study, an overview of procedures for handling different kinds of validity, as well as their corresponding reference sources in the literature, is presented in Table 14.

Table 14. Assessment of Validity of Measures for the Study

Type of Validity/Recommended Procedure	References in the Literature
Construct Validity	Cook and Campbell 1979; Kerlinger and Lee 2000
Factorial Validity	
Extensive literature review for constructs	
Use of existing, validated instruments	Boudreau et al. 2001; Straub 1989; Straub et al. 2004
EFA and CFA	Kerlinger and Lee 2000; Straub et al. 2004
Convergent Validity	
Use of existing, validated instruments	Boudreau et al. 2001; Straub 1989; Straub et al. 2004
CFA (significance of factor loadings' *t* tests)	Anderson and Gerbing 1988; Segars 1997
Discriminant Validity	
Use of existing, validated instruments	Boudreau et al. 2001; Straub 1989; Straub et al. 2004
Casual modeling methods	
High factor loadings of indicators on their corresponding factor & low on others	Chin 1998
Chi-square difference test	Anderson & Gerbing 1988; Bagozzi & Phillips 1982
Confidence interval test	Anderson and Gerbing 1988
Average variance extracted test	Fornell and Larcker 1981

Note: EFA = exploratory factor analysis; CFA = confirmatory factor analysis. Traditionally, MTMM (Campbell and Fiske 1959) assesses convergent and discriminant validity.

Construct Validity

Construct validity deals with whether the variables are true constructs of the phenomenon under observation (Cook and Campbell 1979). In essence, validity assesses whether a study measures what it intends to measure through the operationalization of the variables (Kerlinger and Lee 2000)? This section examines three types of construct validity: factorial, convergent, and discriminant.

Factorial Validity

Two preliminary approaches to factorial validity were used in the present study: an extensive literature review and the use of existing validated instruments. First, an extensive literature review established and covered the variables of interest in the current study. This was done to establish and define the true constructs of the study. Hence, the exogenous variables are eshopping behavior and interactivity level. The endogenous (mediating) variables are eshopping experience, control, attention focus, and cognitive

enjoyment. The endogenous (outcome) variables are consequences of eshopping (future purchase intentions and site attitude). Second, to increase factorial validity, the study used previously validated and reliable scales. Researchers should strive to use existing and already validated scales as much as possible (Boudreau et al. 2001; Straub 1989; Straub et al. 2004).

Specifically in terms of more rigorous techniques, exploratory and confirmatory factor analyses are used to ascertain construct validity (Kerlinger and Lee 2000), and specifically a certain type of construct validity, factorial validity (Straub et al. 2004). *Factorial validity* implies that the variables cleanly load on their intended constructs, without having any cross-loadings which suggest more complex variables (Straub et al. 2004). Complex variables are indicators that measure two or more constructs simultaneously.

Exploratory factor analysis (EFA) in the present study analysis utilized maximum likelihood with equamax rotation. The criteria used in determining how many interpretable factors to retain were the scree test and highest contribution to the proportion for variance accounted for by a given factor (Hatcher 1994). Similar variables tend to group together under and load on the same factor. Within a retained factor, these variables or items in a scale were retained if the absolute value of their factor loadings were at least .50 or higher. Otherwise, an item or question was dropped from the scale. Following EFA, confirmatory factor analysis was also run, and only items that cleanly loaded on their respective construct were kept in the model. The results of the exploratory and confirmatory factor analysis are shown on page 86. Factorial validity reflects both convergent and discriminant validity (Straub et al. 2004).

Convergent Validity

A type of construct validity, *convergent validity* is the degree to which multiple attempts to measure the same concept or construct through different methods are in agreement (Campbell and Fiske 1959). In other words, convergent validity is the extent that different scales are used to measure or *converge* on the same construct, and scores

from all these scales show high correlations (Straub et al. 2004). To enhance convergent validity, previously validated and reliable scales were used in the present study. Boudreau et al. (2001), Straub (1989), and Straub et al. 2004 recommend that researchers use existing and already validated scales in their studies.

Most information systems researchers shy away from using the traditional method for convergent validation, multitrait-multimethod (MTMM) approach (Campbell and Fiske 1959) (Straub et al. 2004). This method requires multiple *traits* or constructs of interest compared against unrelated constructs not under investigation to be measured by multiple *methods*. This may be due to the fact that MTMM requires multiple methodologies to collect data (different instrumentations or sources of information), which may be time-consuming or laborious (Straub et al. 2004). In addition, MTMM has some shortcomings of its own (Straub et al. 2004; Bagozzi 1980; Bagozzi and Phillips 1982), such as the ambiguity of a clear distinction between the validity of a construct and the measurement of it (Bagozzi and Phillips 1982). Both MTMM and the causal modeling method (confirmatory factor analysis) can be used to assess convergent validity (Bagozzi 1980).

Other than MTMM, one causal modeling method to review convergent validity is to run confirmatory factor analysis and examine the *t* tests of the factor loadings of the indicator variables (Anderson and Gerbing 1988; Segars 1997). When all *t* tests are significant, it suggests that the indicator variables are measuring the same construct (Anderson and Gerbing 1988). If the ratio between the factor loadings for the indicators and their corresponding standard errors is statistically significant (greater than two), then convergent validity is supported (Segars 1997). The results of the convergent validity of the model are shown on page 87.

Discriminant Validity

A form of construct validity, *discriminant validity* is the extent a concept or construct is different from other concepts or constructs (Campbell and Fiske 1959). In other words, discriminant validity occurs when different instruments measure different

constructs, and the correlations among the items of these dissimilar or divergent constructs are low (Hatcher 1994; Straub et al. 2004). In essence, the same measures or indicators for a given construct should *discriminate* among (Straub et al. 2004) or *diverge* from all other constructs. Discriminant validity is sometimes mistakenly called divergent validity. To improve discriminant validity, the existing and previously validated and reliable scales were used in the present study. Researchers should strive to use existing and already validated scales whenever possible (Boudreau et al. 2001; Straub 1989; Straub et al. 2004).

Both MTMM and the causal modeling method (CFA) can be used to evaluate discriminant validity (Bagozzi 1980). MTMM (Campbell and Fiske 1959) is the traditional method used to investigate discriminant validity. However, since it requires the use of at least two different methods of data collection (such as surveys and direct observation), it is infrequently used in information systems research (Straub et al. 2004). In addition, MTMM has some shortcomings of its own (Straub et al. 2004; Bagozzi 1980; Bagozzi and Phillips 1982), such as the ambiguous difference between the validity of a construct and the measurement of it (Bagozzi and Phillips 1982).

The causal modeling method (CFA), a different approach to discriminant validation was to run confirmatory factor analysis for the present study and investigate the results of the following procedures (Chin 1998; Hatcher 1994): (1) the requirement that indicators should load more highly on their respective or corresponding construct than on all other constructs (Chin 1998), (2) chi-square difference test (Anderson and Gerbing 1988; Bagozzi and Phillips 1982), (3) the confidence interval test (Anderson and Gerbing 1988), and (4) the average variance extracted test (Fornell and Larcker 1981). The first and fourth procedures jointly are adequate for assessing discriminant validity (Chin 1998). The latter three methods may be conducted in cases where there is a doubt regarding discriminant validation, such as having high correlations among a specific set of constructs (Hatcher 1994). In addition, a comparison of the consistency of the results of the latter three tests should be noted (Hatcher 1994).

The procedure for the chi-square difference test (Anderson and Gerbing 1988; Bagozzi and Phillips 1982) is (1) to establish an unconstrained measurement model where all factors covary; (2) to develop a second constrained measurement model, which is identical to the first model, but with the correlation between any given two constructs (to be tested) is constrained/fixed to unity or 1 (*i.e.* perfectly correlated); and (3) to calculate a chi-square difference test for the aforementioned models. If the chi-square value is significantly smaller for the first model, discriminant validity is achieved since the better fitting model is the one where the two constructs or traits are viewed as distinctly different or not perfectly correlated (but still correlated) (Anderson and Gerbing 1988, p. 416; Bagozzi and Phillips 1982, p. 476).

The confidence interval test (Anderson and Gerbing 1988) is used to estimate a confidence interval between two constructs to test if the interval includes 1.0. The interval is ± 2 standard errors around the correlation between a given pair of factors of interest. If the interval does not contain 1.0, discriminant validity of the two factors is supported. This essentially means that the actual population correlation between the factors is unlikely to be 1.0 (Hatcher 1994), or being a perfect correlation. This perfect correlation means they are exactly the same construct, violating discriminant validity.

The average variance extracted test (Fornell and Larcker 1981) can be used to assess discriminant validity. For any given pair of constructs of interest, the test requires that the average variance extracted for each of the two constructs should be larger than the square of the correlation between these two constructs. Average variance extracted or (AVE) is an index which reflects the degree of variance that is accounted for by an underlying factor in relation to the amount of variance due to measurement error (Fornell and Larcker 1981). In other words, AVE is a measure of the percentage of variance explained by a construct, or the variance shared between a construct and its indictors.
Detailed discussion of the analysis and results of the discriminant validation of the model, based on the aforementioned procedures, are discussed on page 87.

Statistical Power and Minimum Sample Size

Power refers to the probability that a statistical test will correctly reject the null hypothesis when it is false (Kerlinger and Lee 2000; MacCallum et al. 1996). MacCallum et al. (1996) provide two SAS algorithms based on root mean square error of approximation or RMSEA (Steiger and Lind 1980; Browne and Cudeck 1993) to compute both statistical power and minimum sample size for covariance structure modeling. Taking into account the error of approximation in the population, RMSEA measures the discrepancy (as expressed per degree of freedom) in fit between the model of interest and the population covariance matrix if it were available (Browne and Cudeck 1993).

Based on the MacCallum et al. (1996) algorithm and given alpha level of significance = .001, $RMSEA_{Null}$ = .05, $RMSEA_{Alternative}$ = .08, degrees of freedom = 78, N = 310, power was estimated to be .81 for the model (the measurement model derived from confirmatory factor analysis in the *Analysis of Data and Results* chapter). The second algorithm was used to compute a minimum sample size of 303 for a desired level of power of .80, given the same aforementioned values of alpha level of significance, RMSEA, and degrees of freedom. The present study's sample size of 310 exceeded slightly this estimated minimum value.

For structural equation modeling, it is suggested that sample size be the larger of 200 (Marsh et al. 1988) or the minimum ratio of 5:1 between sample size and the number of free parameters that need to be estimated (Bentler and Chou 1987, p. 91; Hatcher 1994). Since there were 58 free parameters in the measurement model, this minimum ratio requirement was fulfilled, since the sample size 310 exceeded 290 (5 x 58 parameters).

The sample size was 310. The total initial sample size was 331, and 21 participants were excluded due to incomplete responses to the questionnaire items or failure to follow directions. Further discussion of this can be found in relation to the last manipulation check in the section, which begins on page 66.

Analytical Methods for Testing the Model and Hypotheses

Two types of methods were used in the analysis of the data: structural equation modeling (SEM) was used to test the entire model, and multivariate analysis of variance (MANOVA) was used to test the effects of the independent variables. This section discusses validity of testing the model and concludes with the pilot study. The research model with the various constructs in the model, the direction of their relationships, and corresponding hypotheses numbers is shown on page 30.

Structural Equation Modeling

The data analysis technique was SEM. SEM was used for data analysis. SEM allowed for testing the causal relationships in the model as a whole at once (hence accounting for mediating effects of the variables, if applicable) and for assessing construct validity of the measures in the model (Hatcher 1994). The SAS' CALIS procedure was used in the analysis. SEM entailed exploratory and confirmatory factor analysis. Confirmatory factor analysis facilitated hypothesis testing of the relationships in the model. CFA allowed for testing of the validity of the measures (factorial, convergent, and discriminant validity, which were defined above in this chapter under their respective sections.)

The structural equation modeling followed a two-step approach (Anderson and Gerbing 1988). Hence, the full model (also known as the complete latent variable model) was comprised of the measurement model and structural model. Derived from confirmatory factor analysis, the measurement model described the relationships between the latent constructs and their corresponding indicator variables. The structural model (or causal model) described the links among the latent constructs themselves.

The analysis of the study's model required the use of the chi-square goodness of fit test; chi-square difference test; and various indices of fit, parsimony, and both fit and parsimony, a brief discussion is shown in Appendix C on page 174. In addition, a discussion of the preprocessing of the two categorical exogenous variables in the model concludes the appendix.

Multivariate Analysis of Variance

Besides SEM, multivariate analysis of variance (MANOVA) was utilized in data analysis. This facilitated the testing of the effects of the independent variables: eshopping behavior and interactivity level. MANOVA was run for a blocked design, with eshopping behavior as the blocking factor. In addition, a random effects ANOVA was run. The ANOVA was a random effects model (Montgomery 2001, p. 518; Ott 1993, pp. 962-967). The blocking factor represented a random sample of blocking factors taken from a larger population of all possible blocking factors (Ott 1993, p. 956; Keppel 1991). The investigator tried to make inferences about the entire population of factors, and not just the ones used in the experiment (Montgomery 2001). Hence, the effects due to the blocking factor were random effects for the ANOVA. Subsequently in the analysis, a multiple comparison procedure (Tukey's studentized range test or Tukey's HSD test) was used to assess how pairs of multiple groups for the factor levels were statistically different from each other.

Regarding the use of Tukey's HSD test, it is appropriate to interpret for a multivariate technique, specifically MANOVA, given that two conditions are met in the following sequence (Hatcher and Stepanski 1994, pp. 286-287; Stevens 1996, pp. 196-198, 203): (1) the multivariate F statistic for Wilks' lambda is significant, which indicates an overall multivariate effect of a given predictor (independent) variable; and (2) the specific univariate F statistic for given criterion (dependent) variable of interest (for which Tukey's HSD test will be interpreted) is significant.

Validity of Testing the Model

This section consists of a discussion of the following types: internal, external, statistical conclusion, and manipulation validity. Reliability and validity of measures had been discussed previously on page 54, which included construct validity (factorial, convergent, and factorial). Procedures for the assessment of validity of testing the model are shown in Table 15.

Table 15. Assessment of Validity of Testing the Model

Type of Validity/Recommended Procedure	References in the Literature
Internal Validity	Cook and Campbell 1979
Research design and methodology	
Laboratory setting enables tight control	Benbasat 1989
Random assignments of treatments	Benbasat 1989
Use of same site for low & high treatments	
Monitoring of subject behavior/follow steps	Camtasia Recorder software (techsmith.com)
External Validity	Cook and Campbell 1979
Research design and methodology	
Random and representative sample	
SEM (sound and valid specification search)	Bentler and Chou 1987; MacCallum et al. 1992
Manipulation checks (real vs. lab eshopping)	
Statistical Conclusion Validity	Cook and Campbell 1979
Research design and methodology	
Random and representative sample	
Random assignment of treatments	
Sound statistics	
Power & minimum sample size for SEM	MacCallum et al. 1996
Reliability and validity assessment	Many sources listed here; Cronbach 1951
Other: alpha level of significance, etc.	
Homogeneity of sample/site/product category	Sawyer and Ball 1981; Calder et al. 1981
Manipulation Validity	Bagozzi 1977, 1980
Research design and methodology	
Manipulation checks on variables	Straub et al. 2004; Camtasia (techsmith.com)

Note: SEM = structural equation modeling.

Internal Validity

Internal validity involves the causation or existence of a relationship between the independent and dependent variables (Cook and Campbell 1979). Sound research design and methodology are in essential to maintaining internal validity. Internal validity is a strength of properly conducted laboratory experiments (Benbasat 1989). Random assignments and control over the independent variables increases internal validity (Benbasat 1989). The subjects are randomly assigned to each group or treatment. The laboratory setting allows for tight control over the independent variables and minimizes extraneous distractions to the subjects.

In addition, only one site landsend.com with two interactivity levels was used in the experiment to minimize the possibility that confounding factors (e.g. brand recognition) are introduced. Had a second web site been built or used with a fictitious brand name, then it would have been difficult to determine if results were due to its low interactive features or difference in brand name. Using just one site allowed for more control and consequently increased internal validity. To increase control, subjects were instructed to follow directions explicitly. Second, a computer program, Camtasia Recorder (techsmith.com), generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. These file were later examined to make sure subjects followed instructions. If they did not follow directions, their data were dropped from the study. Twenty-one participants were excluded due to incomplete responses to the questionnaire items or in a few cases failing to follow directions. Further discussion of this is presented in relation to the last manipulation check in the section, which begins on page 66.

External Validity

External validity refers to the generalizability of the results from a given sample to the entire population and other settings (Cook and Campbell 1979). Hence, there are two kinds of external validity: population and ecological (Gall et al. 2003). *Population validity* reflects the degree to which the findings can be extrapolated to a larger group. *Ecological validity* deals with the extent that the outcome can be applied from the experimental conditions to different conditions and other settings.

A possible threat to external validity in the present study was the homogeneity of both sample (population validity) and web site/product category (ecological validity), but at the same time this homogeneity was advantageous to statistical conclusion validity (Cook and Campbell 1979). The sample included primarily college students, who shared similar age, income, and educational levels. The web site and the product category were based on an apparel retailer, landsend.com. This homogeneity may impacted external validity and generalizability. However, homogeneity of the sample increases statistical

power (Sawyer and Ball 1981). In addition, homogenous samples and laboratory environments (such as those using student samples) may produce better tests of theory in comparison to heterogeneous samples and settings (Calder et al. 1981).

Another threat to ecological validity was the lack of realism in a laboratory environment (Benbasat 1989). However, the tight control of a laboratory setting allowed for better internal validity (Benbasat 1989). The laboratory still simulated aspects of the real environment where users normally sat at home or at work in front of their computers and go online. As a manipulation check, subjects were asked a series of hypothetical questions about the consequences of their eshopping in the current laboratory setting versus a real world setting. These questions are listed in Appendix B on page 170 Results of these questions were presented on page 66.

The solution to these threats to external validity is sound research design and methodology. This entails having a random sample of subjects that reflect a well-defined population of online users, as much as possible. College students reflect many characteristics of young users in the general population who shop online. In any case, with the exception of *My Virtual Model*, the main aspects of eshopping in landsend.com are similar to other technologies of other etailers in terms of interface design and features. Web sites provide product information, make personalized recommendations, and have many other comparable and convenient features. Hence, the results of study were likely to be generalizable to apply to other sites and eshopping experiences.

Regarding data analysis and modifications to the research model based on structural equation modeling, rigorous research methodology entailed care was taken to follow a process of specification search (or a search for modifications that will enhance the fit of the model) that favored locating a path to drop first without affecting the model fit before adding a new path (Bentler and Chou 1987). This sequential process of adding (or dropping) only *one* path at a time in every succeeding revised model minimized data-driven modifications and lack of generalizability of the final model (MacCallum et al. 1992). Each path added was supported from the literature, since any changes made must be theoretically sound and meaningful (MacCallum et al. 1992). Therefore, this may

have minimized the possibility of affecting external validity of the present study in the process.

Statistical Conclusion Validity

Statistical conclusion validity entails having findings and conclusions that are based on sound statistics (Cook and Campbell 1979; Garson 2002), based on good research design and methodology. The alpha level of significance was always reported in the study when a statistical analysis was run. The sample size (310) was sufficient to establish a high level of power .81 as calculated on page 60 (MacCallum et al. 1996). Extensive reliability and validity checks were run for the present study. The sample was a random one. The subjects were assigned randomly to each treatment. Conclusions drawn from the findings were interpreted properly based on these sound statistics. Since both the sample (with college students) and web site/product category (with landsend.com and apparel items) were homogenous, this helped statistical conclusion validity at the potential expense of external validity (Cook and Campbell 1979).

Manipulation Validity and Results

Known also as manipulation checks, manipulation validity involves the inclusion of checks to test the degree by which the subjects are experiencing or perceiving the independent variables or treatments (Bagozzi 1977, 1980; Straub et al. 2004). Good research design lends itself to manipulation validity. This ensures that the subjects are actually manipulated in the experiment (Straub et al. 2004). To determine this type of validity, the investigator can ask subjects directly if they experienced the treatment through a questionnaire or series of questions, or conduct a statistical analysis using descriptive statistics, analysis of variance (ANOVA), *t* tests, etc. (Straub et al. 2004).

There were four main manipulation validity checks in the present study: one for interactivity, another for the endogenous (outcome) variables, one for testing prior exposure to the study's web site, and a final one for the internal validity of the study. The scales and questions for each are shown in Appendix B on page 170.

The first manipulation check pertained to the users' experience with the interactivity levels of landsend.com to test if they were actually experiencing interactivity in the web site. In essence, this manipulation check measured perceived interactivity and compared the results to the actual interactivity level. The interactivity scales of Palmer (2002) and Srinivasan et al. (2002) were administered. The independent-samples *t* test showed a significant difference between the low and high interactivity level groups, $t(298) = 5.94$; $p < .001$. The subjects in the high interactivity level treatment ($M = 5.2$, $SD = .86$) had higher scores in comparison to those in the low interactivity level treatment ($M = 4.6$, $SD = .82$).

The second manipulation check involved a series of hypothetical questions, regarding the consequences of eshopping, to better understand the significance or nonsignificance of the effects in the model on these variables. The questions asked the subjects how they would respond while shopping if they were not in an artificial laboratory setting but rather in a real world scenario. The questions pertained to future purchase intentions and site attitude. The first question (Questn1) applied to future purchase intentions, "If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site." The second question (Questn4) handled side attitude, "If I were not in a research study but was actually shopping for an item online, I would have a positive attitude towards this site." All correlation coefficients were significant ($p < .05$). The Pearson correlations between the actual consequences of eshopping and their hypothetical counterparts were low for future purchase intentions ($r = .40$) and high for site attitude ($r = .71$). The subjects' future purchase intentions may differ between an experimental and a real setting. On the other hand, the attitudes they form towards the site seem likely to be similar regardless of whether they are participating in a research study or shopping in a real environment. Consequently, the conclusion related to the site attitude supported the external validity or generalizability of the results. The Pearson correlation coefficients for the consequences of eshopping and their hypothetical counterparts are shown in Table 16.

Table 16. Correlations for Eshopping Consequences and Manipulation Checks

	Purch. Intention	Site Attitude	Questn1[1]	Questn4[2]
Purch. Intention	1.00			
Site Attitude	.29	1.00		
Questn1	.40	.71	1.00	
Questn4	.27	.71	.63	1.00

[1] Questn1 pertains to future purchase intentions, "If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site."

[2] Questn4 handles side attitude, "If I were not in a research study but was actually shopping for an item online, I would have a positive attitude towards this site."

The third manipulation check tested whether the participants had visited landsend.com prior to the present study to determine if their prior visit may affect the results. Eighty-eight percent of the sample or 274 subjects had never visited the site before the experiment, while 12% or 36 subjects did. Prior site visit effects are displayed in Table 17. There was no significant multivariate effect for prior site visit, Wilks' lambda = .97, $F(6, 293) = 1.40$, $p = .21$. However, these was a significant multivariate interaction effect for interactivity level and prior site visit, Wilks' lambda = .95, $F(6, 293) = 2.33$, $p = .03$. The dependent variables were all the endogenous variables: eshopping experience, control, attention focus, cognitive enjoyment, future purchase intentions, and site attitude. Rerunning the analysis with the either the exclusion or inclusion of the 36 subjects in the sample resulted in arriving at the same findings and the final model of the study. This was probably due to the fact that 36 subjects represented a small portion of the 310 sample, and the main effect of prior site visit was already shown to be nonsignificant. Hence, based on this analysis, neither the main or interaction effect of prior site visit have affected the results of the study.

Table 17. MANOVA Summary Table for Prior Site Visit

Source	Wilks' Lambda	df_{num} [1]	df_{den}	*F*
Eshopping Behavior (A)	.88	12	586	3.16***
Interactivity Level (B)	.92	6	293	4.14***
A X B Interaction	.94	12	586	1.50
Prior Site Visit (C)	**.97**	**6**	**293**	**1.40**
A X C Interaction	.95	12	586	1.37
B X C Interaction	.95	6	293	2.33*
A X B X C Interaction	.94	12	586	1.42

Note: $N = 310$.
[1] *df* = degrees of freedom for multivariate *F* derived from Wilks' lambda (for the numerator and denominator, respectively).
* $p < .05$; ** $p < .01$; *** $p < .001$.

The last manipulation check dealt with the internal validity of the study. Camtasia Recorder (techsmith.com), generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. These files were later examined to make sure subjects followed instructions and stayed within the proper treatment assignment for their interactivity level. If they did not follow directions, their data were dropped from the study. Out of 331 participants, 21 subjects had incomplete responses to the questionnaire items or did not follow instructions, based on the results of viewing the avi files (Windows video file format) generated by Camtasia Recorder. Hence, 310 subjects provided usable responses.

Pilot Study

A pilot study ($N = 105$) was carried out in which users visited landsend.com to search for one item of clothing. Capturing this data, Camtasia Recorder (techsmith.com) generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. The pilot accomplished the following objectives:

- Determine if technical difficulties arise, such as computer crashes due to the use of Camtasia Recorder (techsmith.com)
- Refine the experimental laboratory procedures, including the eshopping task
- Conduct preliminary data collection

- Perform preliminary and exploratory data analysis
- Determine the distribution of experiential, utilitarian, and mixed eshoppers
- Assess reliability (Cronbach's alpha) and construct validity (exploratory factor analysis or EFA) of the instrument and refine the scales as necessary

The results of the pilot study and final study were similar and consistent. To avoid the presentation of redundant results for both the pilot study and final study separately, detailed data analysis and results for the final study are presented in the *Analysis of Data and Results* chapter.

CHAPTER V

ANALYSIS OF DATA AND RESULTS

This chapter reports the analysis of data and results of the study. Reliability and validity of the measurement model is assessed, as well as the future purchase intentions scale. The construct validity includes factorial, convergent, and discriminant validity. Following this is a report of the results of the tests of the model and hypotheses.

Reliability and Validity Assessment of the Measurement Model

This section examines the results of the reliability and validity of the measurement model (in terms of its factorial, convergent, and discriminant validity). However, before evaluating the reliability and validity measures, the measurement model needs to be constructed and analyzed using confirmatory factor analysis.

The structural equation modeling below followed a two-step approach (Anderson and Gerbing 1988). Hence, the full model (also known as complete latent variable model) was comprised of the two following parts:

- Measurement model (based on confirmatory factor analysis) describing the relationships between the latent constructs and their corresponding indicator variables. This includes initial and final measurement models.
- Structural model (or causal model) describing the links among the latent constructs themselves. This entails an initial theoretical model and revised models.

This section begins with confirmatory factor analysis to create a measurement model of acceptable fit. This model will be further tested and revised, with assessment of its reliability and validity, to represent a final measurement model. In addition, the reliability and validity of the future purchase intentions scale are also evaluated. The analysis of the structural equation modeling in this chapter followed in some parts the guidelines of preparing text for the results section of a manuscript as recommended by Hatcher (1994).

Measurement Model

This section details the measurement model stage of fitting an SEM model (Anderson and Gerbing 1988). The measurement model accounts for the links between the latent constructs and their corresponding indicator variables. The measurement model requires confirmatory factor analysis to establish an acceptable fitting model. This section discusses the initial and final measurement models.

Initial Measurement Model

This section covers the initial measurement model with a discussion of its construction, second-order factor analysis, and analysis of the model. The setup of the initial measurement model begins with the results of the exploratory factor analysis.

Exploratory Factor Analysis Results

Exploratory factor analysis with maximum likelihood extraction method with equamax rotation was used to assess construct validity. The criteria used in determining how many interpretable factors to retain are the scree test and highest contribution to the proportion for variance accounted for by a given factor (Hatcher 1994). Related variables tend to group together under and load on the same factor. Within a retained factor, these variables or items in a scale are retained if the absolute value of their factor loadings are at least .50 or higher. Otherwise, an item or question is dropped from the scale. In addition, two other criteria resulted in dropping items: items loading on a factor other than the original factor as reported in the scale from the literature, or items (known as complex variables) loading on multiple factors simultaneously (a clear violation of criteria for factorial validity (Straub et al. 2004). The variables or scale items that are retained after conducting factor analysis are shown in Table 18.

Table 18. Factor Loadings of Retained Items After Factor Analysis

Variables	Factors and Factor Loadings							
	1	2	3	4	5	6	7	8
IntBuy1	.91							
IntBuy2	.81							
IntBuy3	.79							
Attitud2		.73						
Attitud3		.74						
FlwCtrl1			.82					
FlwCtrl2			.66					
FlwCtrl3			.69					
FlwAttn1				.71				
FlwAttn2				.77				
FlwCEnj2					.67			
FlwCEnj3					.60			
EShpExp1						.68		
EShpExp6						.51		
EShpExp7						.63		
Exp3							.79	
Exp8							.61	
Exp9							.64	
Exp10							.56	
Util1								.64
Util3								.60

The interpretation of the factors, based on exploratory factor analysis, was consistent with the original scales, on which they are based, as reported in the literature. Hence, the factors matched and corresponded to the factors in the original scales. For example, the first factor was interpreted as *future purchase intentions*. The second factor was interpreted as *site attitude*, consistent with Teo et al.'s (2003) scale. This was the case with the remainder of the scales: flow experience scale, eshopping experience scale, and personal value shopping scale, as shown in Table 19.

Table 19. Interpretation of Factors From Exploratory Factor Analysis

Scale Source/Factor	Interpretation of the Factor	Variable in the Instrument
Consequences of Eshopping		
Factor 1	Future purchase intentions of items	IntBuy1, IntBuy2, IntBuy3
Factor 2 (Teo et al. 2003)	Attitude towards the site	Attitud2, Attitud3
Webster et al.'s (1993) Scale		
Flow Experience		
Factor 3	Control element of flow experience	FlwCtrl1, FlwCtrl2, FlwCtrl3
Factor 4	Attention focus dimension of flow	FlwAttn1, FlwAttn2
Factor 5	Cognitive enjoyment aspect of flow	FlwCEnj2, FlwCEnj3
Schmitt's (1999) Scale		
Eshopping Experience		
Factor 6	Experience of eshopping	EshpExp1, EshpExp6, EshpExp7
Babin et al.'s (1994) Scale		
Personal Shopping Value		
Factor 7	Experiential eshopping behavior	Exp3, Exp8, Exp9, Exp10
Factor 8	Utilitarian eshopping behavior	Util1, Util3

Initial Measurement Model Construction

The initial measurement model consisted of eight structural variables: future purchase intentions, site attitude, control, attention focus, cognitive enjoyment, eshopping experience, eshopping behavior, and interactivity level.

The full model is a nonstandard model, in which some of the structural variables (*i.e.* eshopping behavior and interactivity level) have single indicator variables, and the other structural variables are latent factors with multiple indicators (Bentler 1989). Eshopping behavior is a categorical construct with a trichotomous classification (experiential, utilitarian, or mixed). Based on experimental design manipulation, interactivity level is a dichotomous, categorical construct with a low or a high treatment levels.

The entire instrument used in the study is shown in Appendix B on page 170. The scales and retained items after exploratory factor analysis are reproduced in Table 20 for convenient reference. EFA is detailed on page 72.

Table 20. Scales and Items Retained After Exploratory Factor Analysis

Scale/Indicator Variable	Variable in Instrument	Scale Item
Future Purchase Intentions		
V1	IntBuy1	I probably intend to buy an item from this site in the future.
V2	IntBuy2	I may buy merchandise from this site in the future.
V3	IntBuy3	In the future, I will likely plan to purchase from this site the item I searched for.
Site Attitude		
V4	Attitud2	This site is enjoyable.
V5	Attitud3	I like this site.
Control		
V6	FlwCtrl1	When using the web site, I felt in control.
V7	FlwCtrl2	I felt that I had no control over my interaction with the site.*
V8	FlwCtrl3	The site allowed me to control the computer interaction.
Attention Focus		
V9	FlwAttn1	When using the site, I thought about other things.*
V10	FlwAttn2	When using the site, I was aware of distractions.*
Cognitive Enjoyment		
V11	FlwCEnj2	Interacting with the site made me curious.
V12	FlwCEnj3	Using the site aroused my imagination.
Eshopping Experience		
V13	EshpExp1	The site tries to engage my senses.
V14	EshpExp6	The site does not try to appeal to feelings.*
V15	EshpExp7	The site tries to intrigue me.
Eshopping Behavior		
V16		*Ternary grouping based on Exp3, 8-10; and Util1, 3*[1]
	Exp3	Online shopping truly feels like an escape.
	Exp8	During shopping online, I feel the excitement of the hunt.
	Exp9	While shopping online, I am able to forget my problems.
	Exp10	While shopping online, I feel a sense of adventure.
	Util1	I accomplish just what I want to while shopping online.
	Util13	While shopping online, I find just the item(s) I am looking for.
Interactivity Level		
V17		*Experimental treatment (dichotomous variable)*[2]

Note: * Indicates a reverse-coded item, as stated in the original scale from the literature.
[1] V16 is the indicator variable for eshopping behavior, based on the study's instrument variables (Exp3, Exp8, Exp9, Exp10, Util1, and Util3) which are used to classify users into the levels of eshopping behavior: experiential, utilitarian, or mixed.
[2] V17 is the indicator variable for interactivity level, which has two levels: low and high.

The variable names of the latent constructs, manifest variables, and their corresponding variable names in the instrument's scales are shown in Table 21. Manifest variables are denoted with a V prefix followed by number, while latent constructs are

represented by an F prefix followed by a number. The model starts with naming the last dependent variable in the causal model with F1, then tracing backward from right to left with F2, F3, etc. with the variables that appear next as recommended by Bentler (1989) and Hatcher (1994). Endogenous (manifest) variables begin with E error or residual terms, and endogenous (latent) variables have D disturbance (or error) terms. These naming conventions are based on those developed by Bentler (1989) for EQS and illustrated with various examples by Hatcher (1994) in SAS using the LINEQS statement in PROC CALIS. The initial full model is shown in Figure 8.

Table 21. Constructs and Indicator in the Measurement Model

Latent Construct (F) Manifest Variable (V)		Indicator Variable	Corresponding Variable Name in the Study's Instrument
Future Purchase Intentions	F1	V1	IntBuy1
		V2	IntBuy2
		V3	IntBuy3
Site Attitude	F2	V4	Attitud2
		V5	Attitud3
Control	F3	V6	FlwCtrl1
		V7	FlwCtrl2
		V8	FlwCtrl3
Attention Focus	F4	V9	FlwAttn1
		V10	FlwAttn2
Cognitive Enjoyment	F5	V11	FlwCEnj2
		V12	FlwCEnj3
Eshopping Experience	F6	V13	EshpExp1
		V14	EshpExp6
		V15	EshpExp7
Eshopping Behavior	V16		Ternary groups using Exp3, 8-10; Util1, 3
Interactivity Level	V17		Experimental treatment (dichotomous)

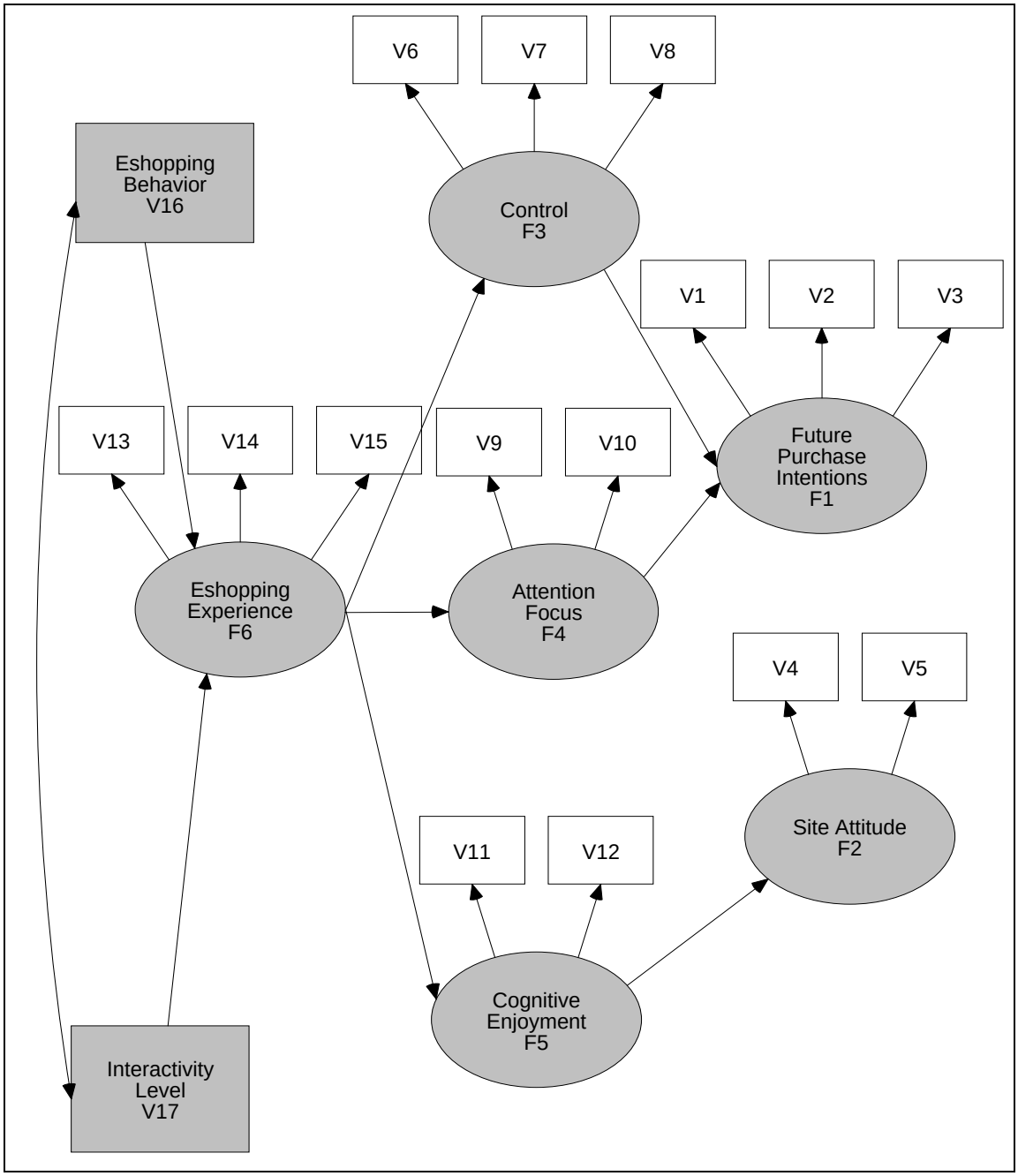

Figure 8. Initial Full Model with Manifest Indicator Variables

One of the necessary conditions for classical structural equation modeling is that the variables are continuous or based on an interval or ratio scales (Hatcher 1994). Since the two exogenous variables are categorical and the indicator variables are measured on Likert scales (with seven categories), all model variables were preprocessed in PRELIS (included with LISREL). PRELIS created the required polychoric (including tetrachoric for the dichotomous variable, interactivity level) correlation matrices (Byrne 1998; Jöreskog and Sörbom 1996a, 1996b). The resulting correlation matrix is shown in Table 22. This is the correlation matrix entered in the PROC CALIS in SAS. The sample size was 310. The intercorrelations among the constructs including the two exogenous variables, eshopping behavior (V16) and interactivity level (V17), are shown in Table 23.

Table 22. Correlation Matrix for the Manifest Indicators

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17
V1	1.00																
V2	.86	1.00															
V3	.86	.75	1.00														
V4	.32	.22	.27	1.00													
V5	.31	.24	.25	.84	1.00												
V6	.26	.27	.18	.23	.30	1.00											
V7	.11	.10	.08	.15	.22	.59	1.00										
V8	.25	.17	.20	.30	.28	.65	.56	1.00									
V9	.28	.26	.28	.17	.09	.20	.24	.25	1.00								
V10	.20	.20	.19	.13	.12	.16	.20	.18	.61	1.00							
V11	.53	.44	.56	.50	.45	.30	.22	.41	.38	.20	1.00						
V12	.48	.39	.44	.41	.36	.29	.17	.31	.29	.19	.71	1.00					
V13	.34	.25	.34	.38	.32	.36	.30	.44	.29	.22	.50	.47	1.00				
V14	.32	.26	.28	.35	.38	.37	.32	.35	.17	.21	.41	.30	.58	1.00			
V15	.44	.36	.36	.32	.28	.28	.21	.33	.27	.17	.58	.67	.67	.48	1.00		
V16	-.06	-.06	-.03	-.05	-.03	.04	-.10	-.13	.04	.03	-.11	-.11	-.11	-.15	-.12	1.00	
V17	.11	.02	.11	.17	.17	-.09	-.03	-.04	.09	-.02	.35	.38	.18	.02	.23	-.06	1.00

Note: $N = 310$.
Future purchase intentions (V1-V3); site attitude (V4-V5); control (V6-V8); attention focus (V9-V10); cognitive enjoyment (V11-V12); eshopping experience (V13-V15); eshopping behavior (V16); interactivity level (V17).

Table 23. Intercorrelation Matrix for the Constructs

		F1	F2	F3	F4	F5	F6	V16	V17
Future Purchase Intentions	**F1**	1.00							
Site Attitude	**F2**	.34	1.00						
Control	**F3**	.28	.35	1.00					
Attention Focus	**F4**	.30	.16	.30	1.00				
Cognitive Enjoyment	**F5**	.61	.58	.46	.42	1.00			
Eshopping Experience	**F6**	.44	.50	.61	.33	.67	1.00		
Eshopping Behavior	**V16**	-.06	-.04	-.08	.04	-.13	-.16	1.00	
Interactivity Level	**V17**	.10	.18	-.07	.09	.42	.15	-.06	1.00

Note: $N = 310$.

Second-Order Factor Analysis

The exploratory factor analysis discussed on page 72 shows that the indicator variables loaded on their associated factors. However, the items from the Schmitt (1999) eshopping experience instrument failed to load on separate dimensions of sensory, affective, and cognitive eshopping experiences. Six items (EshpExp2-5, 8, 9) loaded on other factors or failed to achieve the cutoff point for factor loadings, the absolute value of .50 or higher. Only three items (EshpExp1, the first sensory item; EshpExp6, the third affective item; and EshpExp7, the first cognitive item) loaded on one interpretable factor, eshopping experience. As a consequence, eshopping experience was defined in terms of three items as an overall experience, and the remaining six items are dropped from the scale. Furthermore, subsequent confirmatory factor analysis of the measurement model revealed that EshpExp7 should be dropped from the scale because it was a complex variable measuring multiple constructs simultaneously. Hence, Schmitt's (1999) eshopping experience scale was reduced from an initial nine-item scale to a usable two-item scale in the current study.

Second-order confirmatory factor analysis (Byrne 1994) was run to test the unidimensionality of sensory, affective, and cognitive eshopping experiences, since concerns with construct validity and unidimensional validity surfaced as a result of the exploratory factor analysis with these constructs. Three nested measurement models

were run. The first model had sensory, affective, and cognitive eshopping experiences as first-order factors; and eshopping experience as a second-order factor. The second model treated sensory, affective, and cognitive eshopping experiences as first-order factors. The third model examined eshopping experience as a first-order factor.

A chi-square difference test was conducted to compare the fit of the three models. The chi-square difference test between the first and second model resulted in a nonsignificant difference of 175.48 – 175.48 = .00 < tabulated $\chi^2(1) = 3.84$ ($p < .05$), with a difference of 29 – 24 = 5 degrees of freedom. The second model (second-order) provided a statistically significant better fit than the first model (first-order). However, the chi-square difference test between the third and second model resulted in a significant difference of 190.73 – 175.48 = 15.25 > tabulated $\chi^2(5) = 11.07$ ($p < .05$), with a 29 – 24 = 5 degrees of freedom.

Hence, eshopping experience is a unidimensional first-order factor without the multidimensional dimensions of sensation, affection, and cognition, based on the present study's second-order confirmatory factor analysis of the Schmitt (1999) eshopping experience scale.

Subsequent confirmatory factory analysis was used to arrive at a good fitting measurement model. A final and revised model was achieved after a modification to the initial measurement model. A good fitting measurement model enhances validity.

Initial Measurement Model Analysis

The initial measurement model was identical to the model shown on page 77, except the initial measurement model did not include the causal paths among the constructs. The chi-square value for the initial measurement model was statistically nonsignificant, $\chi^2(93, N = 310) = 290.15$, $p < .001$. The χ^2/df ratio was 3.1, exceeding the 3:1 desirable fit threshold (Chin and Todd 1995). The RMSEA was .083, which exceeded the .08 acceptable threshold (Browne and Cudeck 1993; MacCallum et al. 1996). Furthermore, the model did not provide a good fit, based in part on the pattern of normalized residuals (asymmetrical and not centered around zero), the nonsignificance

of some of the parameter tests, and the result of the Lagrange multiplier test (Bentler 1989). Therefore, modifications were required to improve the model fit to arrive at a final measurement model.

Estimating the drop in the chi-square value if a new factor loading, covariance, (or a path in a structural model) is added, the Lagrange multiplier test showed that adding V15 to cognitive enjoyment (F5) would result in an estimated 27.26 drop in the chi-square value, and adding it to control (F3) would drop the chi-square value by 12.87. However, this addition was problematic as it reflects that V15 is a complex manifest indicator, which is a variable that measures two or more constructs simultaneously. This variable V15 (or EshpExp7 in the instrument) was causally affected by its original construct (eshopping experience, F6). These factor loadings additions would make V15 affected by additional, alternative constructs (control, F3; and cognitive enjoyment, F5).

Therefore, in support of factorial validity, this multidimensional indicator V15 was dropped from the measurement model, and model is tested again to arrive at a final measurement model.

Final Measurement Model

The revised measurement model (M_m) was the same as the initial measurement model shown on page 77, but without the V15 manifest indicator variable for eshopping experience (F6). The χ^2/df ratio of M_m was 2.45, falling below the 3:1 desirable fit threshold. The RMSEA was .068, which was less than the .08 acceptable threshold. Bentler and Bonett's (1980) non-normed-fit index (NNFI), as well as Bentler's (1989) comparative fit index (CFI), are greater than .90. Hence, these fit indices showed acceptable fit. This was the study's final measurement model. However, further testing of the reliability and validity of the M_m was required.

The reliability and validity measures of M_m are shown in Table 24 (adapted from Hatcher 1994). These measures presented in the table are relevant to the discussion of reliability and validity (factorial, convergent, and discriminant validity), as well as manipulation validity, in this section. The analysis below followed in part the guidelines

of preparing text for the results section of a manuscript as recommended by Hatcher (1994).

Table 24. Properties of the Measurement Model (Adapted from Hatcher 1994)

Constructs and Their Indicators	Standard. Loading	*t*[1]	Cronbach's Alpha	Composite Factor Reliability	Item-Total Correlation[2]	AVE[3]
Purchase Intentions			.91	.94[4]		.83
V1	.99	23.76		.98[5]	.72	
V2	.87	19.05		.75	.64	
V3	.87	19.23		.76	.67	
Site Attitude			.88[6]	.91		.84
V4	.94	19.14		.89	.60	
V5	.89	17.68		.79	.57	
Control			.79	.82		.60
V6	.80	15.49		.64	.52	
V7	.70	12.94		.48	.42	
V8	.82	15.97		.67	.56	
Attention Focus			.72	.79		.67
V9	.97	11.71		.94	.51	
V10	.63	9.11		.40	.43	
Cognitive Enjoyment			.79	.83		.71
V11	.89	18.61		.79	.73	
V12	.79	15.92		.63	.66	
Eshopping Experience			.71	.74		.58
V13	.81	14.55		.66	.63	
V14	.71	12.62		.50	.59	
V15	*Dropped*[7]					

[1] All *t* tests were significant at $p < .001$. This was evidence of convergent validity (Anderson and Gerbing 1988; Segars 1997).

[2] Item-total correlation is the correlation between the individual scores for a scale item and the total score on the questionnaire (Black 1999, p. 280).

[3] Average variance extracted (AVE) = $\Sigma L_i^2 / (\Sigma L_i^2 + \Sigma var(E_i))$, where L_i is the standardized factor loading for a given factor, $var(E_i) = 1 - L_i^2$ is the measurement error or the error variance associated with the individual indicator variable(s) for that given factor (Fornell and Larcker 1981).

[4] Composite factor reliability = $(\Sigma L_i)^2 / ((\Sigma L_i)^2 + \Sigma var(E_i))$ (Werts et al. 1974).

[5] Indicator reliability is the square of the standardized factor loading (Bollen 1989, p. 221; Long 1983, p. 72).

[6] Values under the Cronbach's alpha column for a scale with a pair of indicators only are actually the Pearson correlations for those two indicators.

[7] The V15 indicator variable was dropped during confirmatory factor analysis to arrive at the final measurement model. V15 loaded on multiple factors simultaneously.

Reliability Results

Two types of reliability measures for each of the entire scale and the individual scale items were calculated. For scale items, Cronbach's (1951) alpha and composite factor reliability (Werts et al. 1974) were evaluated. Item-total correlations, as well as indicator reliability (Bollen 1989, p. 221; Long 1983, p. 72), were calculated for each scale item. The scale and item reliability measures are shown in Table 25.

Table 25. Scale and Item Reliability Measures

	Entire Scale		Individual Items	
Construct and Indicators	**Cronbach's Alpha**	**Composite Factor Reliability[1]**	**Item-Total Correlation[2]**	**Indicator Reliability[3]**
Purchase Intentions	.91	.94		
V1			.72	.98
V2			.64	.75
V3			.67	.76
Site Attitude	.88[4]	.91		
V4			.60	.89
V5			.57	.79
Control	.79	.82		
V6			.52	.64
V7			.42	.48
V8			.56	.67
Attention Focus	.72	.79		
V9			.51	.94
V10			.43	.40
Cognitive Enjoyment	.79	.83		
V11			.73	.79
V12			.66	.63
Eshopping Experience	.71	.74		
V13			.63	.66
V14			.59	.50
V15	*Dropped*[5]			

[1] Composite factor reliability = $(\Sigma L_i)^2 / ((\Sigma L_i)^2 + \Sigma var(E_i))$, where L_i is the standardized factor loading for a given factor, $var(E_i) = 1 - L_i^2$ is the measurement error or the error variance associated with the individual indicator variable(s) for that given factor (Werts et al. 1974).

[2] Item-total correlation is the correlation between the individual scores for a scale item and the total score on the questionnaire (Black 1999, p. 280).

[3] Indicator reliability is the square of the standardized factor loading (Bollen 1989, p. 221; Long 1983).

[4] Values under the Cronbach's alpha column for a scale with a pair of indicators only are actually the Pearson correlations for those two indicators.

[5] The V15 indicator variable was dropped during confirmatory factor analysis.

Scale Reliability

For the reliability assessment of an entire scale, both Cronbach's alpha and composite factor reliability were calculated for that scale. Cronbach's alpha for each individual scale exceeded .70, and the composite Cronbach's alpha for each separate instrument from the literature also surpassed .70. The composite reliability, as well as the values of the individual scale reliability, is shown in Table 26.

Table 26. Cronbach's Alpha Values of the Instrument's Scales

Source/Scale	Variable in the Scale	Cronbach's Alpha
Consequences of Eshopping Scales		.82[1]
Future Purchase Intentions (F1)	V1, V2, V3	.91
Site Attitude (F2) (Teo et al. 2003)	V4, V5	.88[2]
Webster et al.'s (1993) Flow Experience Scales		.74
Control (F3)	V6, V7, V8	.79
Attention Focus (F4)	V9, V10	.72
Cognitive Enjoyment (F5)	V11, V12	.79
Schmitt's (1999) Eshopping Experience Scale		
Eshopping Experience (F6)	V13, V14[3]	.71
Babin et al.'s (1994) Personal Shopping Value Scale		.74
Experiential Eshopping Behavior	V16[4] (Exp3, Exp8-10)	.81
Utilitarian Eshopping Behavior	V16 (Util1, Util3)	.70

[1] Denotes composite Cronbach's alpha.
[2] Values in the Cronbach's alpha column for a pair of scale items is actually its Pearson correlation.
[3] During confirmatory factor analysis of the final measurement model, V15 is dropped.
[4] V16 is the indicator variable for eshopping behavior, based on the study's instrument variables (Exp3, Exp8, Exp9, Exp10, Util1, and Util3) which are used to classify users into the levels of eshopping behavior: experiential, utilitarian, or mixed.

The *composite factor reliability* index (Werts et al. 1974) is similar to Cronbach's alpha and is a measure of the internal consistency of the indicators measuring a given factor (Hatcher 1994). The composite factor reliability is calculated with the following formula:

$$Composite\ factor\ reliability = \frac{\left(\sum L_i\right)^2}{\left(\sum L_i\right)^2 + \sum \mathrm{var}(E_i)}$$

where

L_i = the standardized factor loading for a given factor

$\mathrm{var}(E_i) = 1 - L_i^2$ or the measurement error associated with each indicator variable

The measurement error is the error variance associated with each of the indicator variables for that given factor. Composite factor reliability for the latent factors should be greater than .70 (or at least .60) (Fornell and Larcker 1981). The composite factor reliability values for each factor were greater than .70 and were consistent with the values of Cronbach's alpha, as shown on page 83.

Reliability of Individual Items in a Given Scale

For the reliability assessment for individual scale items, both item-total correlations and indicator reliability were calculated. *Item-total correlation* is the correlation between the individual scores for a scale item and the total score on the questionnaire (Black 1999, p. 280). This assesses how consistently a scale item measures the same concept as the questionnaire as a whole (Black 1999). Hence, high values indicate good reliability, and low or negative values reflect poor reliability. The calculations of the item-total correlations were based on an illustration by Black (1999, p. 280). The values of the item-total correlations ranged from .42 to .73, as shown on page 83. Most items had relatively moderate to high values.

Indicator reliability, or reliability of each indicator, is the factor loadings squared (Bollen 1989, p. 221; Long 1983, p. 72). The indicator reliability shows the percent of variation in the indicator variable that is accounted for by its factor. The R^2 values represent the indictor reliability (Bollen 1989, p. 221). For example, the standardized factor loading of the path from future purchase intentions (F1) to indicator (V1) was .99. The square of this loading is .98, meaning the reliability of V1 is .98. Hence, 98% of the variation in V1 was explained by future purchase intentions (F1). The indicator

reliability ranged from .40 to .98, with a few having low values and most having relatively moderate to high values.

Both values of the item-total correlations and indicator reliability for a given item were relatively consistent in terms of reflecting reliability for that given indicator variable. For example, both values for the item-total correlation and indicator reliability for V11 were .79 and .73, respectively.

Even though a couple of individual items had low values both for the item-total correlations (control's V7 or equivalently FlwCtrl2, .42; and attention focus' V10 or FlwAttn2, .43) and indicator reliability (V7, .48; and V10, .40), the measures for the entire scales (Cronbach's alpha and composite factor reliability) were high or above .70. These two items (V7 and V10) were not dropped from their respective scales to maintain at least two or three indicator variables per scale, after conducting confirmatory factor analysis. Generally, the reliability measures for the entire scale are usually of more imperative concern.

Factorial Validity Results

Both exploratory and confirmatory factor analyses are used to assess factorial validity. Following exploratory factor analysis conducted earlier on page 72, the confirmatory factor analysis of the measurement model also reflected its factorial validity. Specifically, one scale item (V15) for the eshopping experience construct was dropped from the model, since it was a complex variable having cross-loadings on multiple constructs simultaneously. The indication of cross-loading was the result of the analysis of the Lagrange multiplier tests. Consequently, all indicator variables loaded cleanly on their corresponding constructs in the final measurement model, indicating factorial validity. In addition, as previously discussed on page 79, eshopping experience is a unidimensional first-order factor. Factorial validity also entails a discussion of convergent and discriminant validity (Straub et al. 2004).

Convergent Validity Results

For the final measurement model, the absolute values of the *t* tests for each factor loading exceeded 3.29, *i.e.* significant ($p < .001$), as shown on page 82. Values of the *t* test greater than 1.960 are significant at $p < .05$; 2.576, $p < .01$; and 3.291, $p < .001$. The null hypothesis tests that the coefficients are equal to zero in the population. For example, in examining the convergent validity of the indicators measuring future purchase intentions (F1), the values of the *t* tests of the indicators were V1 (23.76), V2 (19.05), and V3 (19.23). All three values were significantly different from zero ($p < .001$). Hence, the convergent validity of V1, V2, and V3 as measures of future purchase intentions (F1) was supported. The values of all *t* tests ranged from 9.11 to 23.74, which means they were significant ($p < .001$). The statistical significance of the results of the *t* tests supported the convergent validity of the indicator variables (Anderson and Gerbing 1988; Segars 1997).

It is also noteworthy to show that all indicators (V1-V14) for any given construct are highly correlated with each other, as shown in the correlation matrix on page 78. (Ignore V15, V16, and V17. V15 had been dropped from the final measurement model. V16 and V17 are indicator variables for each of the exogenous variables, which are represented as a single manifest variable.) For example, V1, V2, and V3 measured future purchase intentions, and the correlations between any of these pairs exceeded any correlation between each of them and any other indicator for other constructs. The correlation between V1 and V2 was .86; V1 and V3, .86; V2 and V3, .75. The high correlations between any pair of indicators of a given construct support convergent validity, while low correlations between them and other indicators of other constructs support discriminant validity.

Discriminant Validity Results

An approach to discriminant validation is to run confirmatory factor analysis and investigate the results of the following procedures (Chin 1998; Hatcher 1994): (1) the requirement that indicators should load more highly on their respective or corresponding

construct than on all other constructs (Chin 1998), (2) chi-square difference test (Anderson and Gerbing 1988; Bagozzi and Phillips 1982), (3) the confidence interval test (Anderson and Gerbing 1988), and (4) the average variance extracted test (Fornell and Larcker 1981). The first and fourth procedures jointly are adequate for assessing discriminant validity (Chin 1998). The latter three methods may be conducted in cases where there is a doubt regarding discriminant validation, such as having high correlations among a specific set of pairs of constructs (Hatcher 1994). In addition, a comparison of the consistency of the results of the latter three tests should be noted (Hatcher 1994).

First, to show discriminant validity, indicator variables should load highly on their respective and corresponding constructs and load low on other constructs (Chin 1998). In other words, factor loadings should be larger than cross-loadings. There should also be no complex variables, or variables loading on multiple constructs simultaneously. All indicator variables following confirmatory factor analysis loaded highly on their respective constructs and load low on all other constructs, as shown in Table 27. The results of the factor loadings of the measurement model's indicator variables support discriminant validity.

Table 27. Factor Loadings of the Indicator Variables

Latent Construct		Variable Name in Instrument	Indicator Variable	Factors and Factor Loadings F1	F2	F3	F4	F5	F6
Purchase Intentions	F1	IntBuy1	V1	.91	.16	.09	.14	.14	.12
		IntBuy2	V2	.81	.14	.10	.13	.11	.09
		IntBuy3	V3	.79	.07	.05	.15	.19	.08
Site Attitude	F2	Attitud2	V4	.06	.73	.13	.08	.16	.16
		Attitud3	V5	.07	.74	.19	.04	.09	.08
Control	F3	FlwCtrl1	V6	.11	.06	.82	.07	.04	.09
		FlwCtrl2	V7	-.02	-.02	.66	.14	-.03	.08
		FlwCtrl3	V8	.08	.07	.69	.13	.17	.16
Attention Focus	F4	FlwAttn1	V9	.12	-.03	.12	.71	.16	.04
		FlwAttn2	V10	.04	.04	.09	.77	-.06	.07
Cognitive Enjoyment	F5	FlwCEnj2	V11	.27	.17	.16	.22	.67	.17
		FlwCEnj3	V12	.24	.14	.13	.17	.60	.30
Eshopping Experience	F6	EShpExp1	V13	.09	.06	.25	.19	.20	.68
		EShpExp6	V14	.13	.12	.31	.14	-.01	.51

Before reporting the remaining three tests, it is relevant to point out that three pairs of constructs shared moderately high correlations (.60 and .70 or higher), which meant that each pair were actually the same construct, a potential violation of criteria for discriminant validity (Hatcher 1994). In essence, that may have indicated each construct's indicator variables were measuring the same concept. These pairs were the following, as shown on page 79: cognitive enjoyment (F5) and eshopping experience (F6), r = .67; future purchase intentions (F1) and cognitive enjoyment (F5), r = .61; and control (F3) and eshopping experience (F6), r = .61.These moderately high correlations were appropriate since the research model's hypotheses predicted such strong and positive relationships (Hatcher 1994): F6 to F5 (H6); F5 to F1 (P1, an additional causal link based on forthcoming analysis below); and F6 and F3 (H4). However, what was of concern was the magnitude of the correlation (Hatcher 1994). Therefore, these three pairs were especially scrutinized in the remaining discriminant validity analysis.

In conducting the second test (chi-square) and third test (confidence interval), it was important to keep track of the number of tests conducted since this affected the overall significance level for the family of tests (Stevens 1996, p. 7). This reflects the *Bonferroni Inequality*. To solve this problem, it is very important to use a small p value for each test and to conduct as few tests as necessary (Hatcher 1994). The overall significance level for a family of tests is calculated with the following formula (Stevens 1996, p. 7):

$$\alpha_0 = 1 - (1 - \alpha_i)^k$$

where

α_0 = the overall level of significance for the family of tests

α_i = the level of significance for each individual test

k = the number of tests conducted

Given α_i is .001 and k was 3, α_0 is .003, which was acceptable since it is close to the level of significance of each individual test, .001.

Second, in order to assess discriminant validity, a chi-square difference test (Anderson and Gerbing 1988; Bagozzi and Phillips 1982) was run. The procedure for

this test was (1) to establish an unconstrained measurement model where all factors covary; (2) to develop a second constrained measurement model, which is identical to the first model, but with the correlation between any given two constructs (to be tested) is constrained/fixed to unity or 1 (*i.e.* perfectly correlated); and (3) to calculate a chi-square difference test for the aforementioned models. If the chi-square value is significantly smaller for the first model, discriminant validity is achieved since the better fitting model is the one where the two constructs or traits are viewed as distinctly different or not perfectly correlated (but still correlated) (Anderson and Gerbing 1988, p. 416; Bagozzi and Phillips 1982, p. 476). The unconstrained measurement model (M_m) had a significantly lower χ^2 value (190.76) in comparison to any of the values of the other three constrained model ($p < .001$), as shown in Table 28: M_{c1} for F5 and F6; M_{c2} for F1 and F5; and M_{c3} for F3 and F6. With 1 *df*, the critical value of chi-square is 10.83 at $p = .001$. M_m provides a better fit than any of the other three models based on the chi-square difference test; this conclusion was also evident in the model's lowest value of RMSEA (.068), which is below the .08 cutoff point of acceptable fit. Therefore, the three chi-square difference tests supported the discriminant validity of F5 and F6, F1 and F5, and F3 and F6. In turn, the tests provided evidence for discriminant validity of the study's measurement model.

Table 28. Chi-Square Difference Test for Discriminant Validation

Model Characteristics					Model Comparison			
Model	**Constructs**	**χ^2**	***df***	**RMSEA**	**Comparison**	**$\Delta\chi^2$**	**Δdf**	**Signif.**
M_m		190.76	78	.068				
M_{c1}	F5 and F6	248.27	79	.083	M_{c1}-M_m	57.51	1	Yes
M_{c2}	F1 and F5	329.76	79	.101	M_{c2}-M_m	139.00	1	Yes
M_{c3}	F3 and F6	259.76	79	.086	M_{c3}-M_m	69.00	1	Yes

Note: RMSEA = root mean square error of approximation.
$p < .001$ for each individual test.
$p < .003$ for the overall significance level for the family of chi-square tests.

Third, to evaluate discriminant validity, the confidence interval test (Anderson and Gerbing 1988) was conducted. The test estimates a confidence interval between two constructs to test if the interval includes 1.0. The interval is ± 2 standard errors around the correlation between a given pair of factors of interest. If the interval does not contain 1.0, discriminant validity of the two factors is supported. This essentially means that the actual population correlation between the factors is unlikely to be 1.0 (Hatcher 1994), or being a perfect correlation. This perfect correlation means they are exactly the same construct, violating discriminant validity. None of the sets of lower and upper boundaries for the confidence intervals for any of the three pairs of constructs included 1.0, as shown in Table 29. Thus, the results of the confidence interval test demonstrate discriminant validity.

Table 29. Confidence Interval Test for Discriminant Validation

					Confidence Interval	
Constructs		**Correlation**	**S.E.**	**2 x S.E.**	**Lower Boundary**	**Upper Boundary**
F5	F6	.67	.05	.10	.57	.77
F1	F5	.61	.04	.08	.53	.69
F3	F6	.61	.05	.11	.50	.72

Note: S.E. = standard error.

Average variance extracted (AVE), or variance extracted estimate, is an index which reflects the degree of variance that is accounted for by an underlying factor in relation to the amount of variance due to measurement error (Fornell and Larcker 1981). In other words, AVE is a measure of the percentage of variance explained by a construct, or the variance shared between a construct and its indictors. For example, in the case of the future purchase intentions (F1) construct, 83% of the variance was captured by the construct, while 17% was due to measurement error. AVE is calculated with the following formula:

$$AVE = \frac{\sum L_i^2}{\sum L_i^2 + \sum \text{var}(E_i)}$$

where

L_i = the standardized factor loading for a given factor

$\text{var}(E_i)$ = $1 - L_i^2$ or the measurement error associated with each indicator variable

The measurement error is the error variance associated with each of the indicator variables for that given factor, and it is equivalent to $1 - R^2$. The AVE for the latent factors must be greater than .50 (Fornell and Larcker 1981; Segars 1997), which is the case as shown on page 82.

Fourth, in order to demonstrate discriminant validity, the average variance extracted test was run (Fornell and Larcker 1981). For any given pair of constructs of interest, the test requires that the AVEs for each of the two constructs should be larger than the square of the correlation between these two constructs. For example, the highest correlation between any two pairs of constructs was between cognitive enjoyment (F5) and eshopping experience (F6). The correlation between them was .67, and the square of the correlation was .45, as shown on page 79. The AVEs for both were .71 and .58, which exceeded the squared correlation of .45. The leading diagonal figures showed the AVE, which was greater than the off-diagonal figures that represented the square of the correlations among the constructs, as shown in Table 30. Therefore, the constructs shared more variance with their corresponding indicator variables than with other constructs in the model. Specifically, this was also the case with the other two pairs of constructs that show high correlations: future purchase intentions (F1) and cognitive enjoyment (F5); control (F3) and eshopping experience (F6). Hence, the average variance extracted test supported the discriminant validity of the measurement model.

Table 30. Average Variance Extracted Test for Discriminant Validation

	Purchase Intentions	Site Attitude	Control	Attention Focus	Cognitive Enjoyment	Eshopping Experience
Purchase Intentions	.83					
Site Attitude	.12	.84				
Control	.08	.12	.60			
Attention Focus	.09	.03	.09	.67		
Cognitive Enjoyment	.37	.34	.21	.18	.71	
Eshopping Experience	.19	.25	.37	.11	.45	.58

Note: The shaded leading diagonal figures represent AVE. The off-diagonal elements are the square of the correlations among the constructs.

An approach to discriminant validation is to run confirmatory factor analysis and investigate the results of the following procedures (high loadings of indicator variables on their construct than all other constructs, chi-square difference test, the confidence interval test, and the average variance extracted test). These procedures support the discriminant validity of the measurement model. All four tests showed the same consistent result.

Conclusion Regarding Reliability and Validity of the Model

Therefore, an acceptable final measurement model was reached, based on these statistical tests and properties of the reliability and validity (factorial, convergent, and discriminant). This model was used as a benchmark for all the other models of interest in terms of comparison of fit.

Future Purchase Intentions Scale's Reliability and Validity

Developed during the course of the present study, the future purchase intentions scale is a three-item scale, which measures the likelihood that a user will purchase an item or a product online while shopping. The scale appears in Table 31. This section discusses how adequately the scale met reliability and validity (factorial, convergent, and discriminant) measures, as well as manipulation validity.

Table 31. Future Purchase Intentions Scale

Indicator Variable	Variable in Instrument	Scale Item
V1	IntBuy1	I probably intend to buy an item from this site in the future.
V2	IntBuy2	I may buy merchandise from this site in the future.
V3	IntBuy3	In the future, I will likely plan to purchase from this site the item I searched for.

Reliability of the Future Purchase Intentions Scale

Reliability measures for both the entire future purchase intentions scale, as well as its individual items were assessed. Both Cronbach's (1951) alpha and composite factor reliability (Werts et al. 1974) were consistently high and above the .70 cutoff point for the entire scale. For individual scale items, item-total correlations, as well as indicator reliability (Bollen 1989, p. 221; Long 1983, p. 72) were assessed. Values for both measures were moderate to high, ranging from .64 to .72 for item-total correlations and from .75 to .98 for indicator reliability. Reliability measures for the future purchase intentions scale are obtained from page 83 and summarized in Table 32 for reference.

Table 32. Summary of Reliability Measures for Future Purchase Intentions Scale

	Entire Scale		Individual Items	
Construct and Indicators	Cronbach's Alpha	Composite Factor Reliability[1]	Item-Total Correlation[2]	Indicator Reliability[3]
Purchase Intentions	.91	.94		
V1			.72	.98
V2			.64	.75
V3			.67	.76

Note: $N = 310$.

[1] Composite factor reliability = $(\Sigma L_i)^2 / ((\Sigma L_i)^2 + \Sigma var(E_i))$, where L_i is the standardized factor loading for a given factor, $var(E_i) = 1 - L_i^2$ is the measurement error or the error variance associated with the individual indicator variable(s) for that given factor (Werts et al. 1974).

[2] Item-total correlation is the correlation between the individual scores for a scale item and the total score on the questionnaire (Black 1999, p. 280).

[3] Indicator reliability is the square of the standardized factor loading (Bollen 1989, p. 221; Long 1983, p. 72).

In addition, the pilot study ($N = 105$) showed results that were consistent with the reliability findings of the final study, giving more credence to the reliability of the scale. Cronbach's alpha for the pilot study for the future purchase intentions scale was .94. This comparison of the values of Cronbach's alpha for the two studies is a crude way of establishing a measure of stability, *test-retest reliability*, whereby a comparison is made across time of the results of an instrument given to the *same* (or similar in this case) sample (Straub et al. 2004).

Based on the confirmatory factor analysis results and assessment of reliability and validity of the final measurement model, the future purchase intentions scale has satisfied several reliability and validity criteria.

Factorial Validity of the Future Purchase Intentions Scale

Results of factor analysis supported the factorial validity of the scale. All scale items (IntBuy1, IntBuy2, and IntBuy3) or their corresponding indicator variables (V1, V2, and V3, respectively) loaded highly on one factor (.91, .81, and .79, respectively), interpretable as future purchase intentions based on exploratory factor analysis, as shown on pages 73 and 88. Confirmatory factor analysis revealed the same result: the items loaded cleanly and only on future purchase intentions without any cross-loadings on other constructs. Hence, none of the three indicators were dropped from the measurement model. The standardized factor loadings had the values .99, .87, and .87 for V1, V1, and V3, respectively, as shown on page 82. Factorial validity reflects both convergent and discriminant validity (Straub et al. 2004).

Convergent Validity of the Future Purchase Intentions Scale

Regarding convergent validity, the absolute values of the *t* tests for each of the factor loadings for V1, V2, and V3 exceeded 3.29 and hence were significant ($p < .001$), as shown on page 82. The statistical significance of the results of the *t* tests supported the convergent validity of the indicator variables (Anderson and Gerbing 1988; Segars 1997). The AVE value for future purchase intentions was .83, which indicated that 83%

of the variance was captured by the construct, leaving 17% due to measurement error. In other words, V1, V3, and V3 explained 83% of variability in future purchase intentions.

It is also noteworthy to mention that the indicators were highly correlated with each other, as shown in the correlation matrix on page 78. The correlations between any of these pairs exceeded any correlation between each of them and any other indicator for other constructs. The correlation between V1 and V2 was .86; V1 and V3, .86; V2 and V3, .75. The high correlations between any pair of these indicators supported convergent validity, while low correlations between them and other indicators of other constructs supported discriminant validity.

Discriminant Validity of the Future Purchase Intentions Scale

An approach to discriminant validation is to run confirmatory factor analysis and investigate the results of the following procedures: (1) requirement of having higher factor loadings of indicators on their corresponding construct than on any other construct, (2) chi-square difference test, (3) confidence interval test, and (4) average variance extracted test. The results of the four procedures supported the discriminant validity of the future purchase intentions scale with the same consistent result.

First, following confirmatory factor analysis V1, V2, and V3 loaded more highly on future purchase intentions than they did on any other construct, as shown on page 88. This supported the discriminant validity of the indicators for future purchase intentions.

The remaining tests were run on constructs that are highly correlated with future purchase intentions. This meant that the pairs were actually the same construct, a potential violation of criteria for discriminant validity (Hatcher 1994). Future purchase intentions (F1) and cognitive enjoyment (F5) had a moderately high correlation ($r = .61$), as shown on page 79. All other correlations with future purchase intentions were below .45 and hence are ignored in this analysis.

Second, the chi-square difference test, as shown on page 90, indicated that the unconstrained measurement model (M_m) had a significantly lower χ^2 value (190.76, $p <$ .001) in comparison to M_{c2} (329.76), which was the constrained model having future

purchase intentions (F1) and cognitive enjoyment (F5) constrained to 1.0. In turn, the chi-square difference test provides evidence for the discriminant validity of future purchase intentions and cognitive enjoyment.

Third, the confidence interval test between future purchase intentions (F1) and cognitive enjoyment (F5), with two standard errors around their correlation (r = .61), had a lower boundary of .53 and an upper boundary .69, as shown on page 91. This confidence interval did not contain 1.0. As a result, this showed discriminant validity of the measures.

Fourth, the average variance extracted test showed that AVEs for each of future purchase intentions and any given construct (the leading diagonal values) were larger than the square of the correlation between these two constructs (the off-diagonal values), as shown on page 93.

Manipulation Validity of the Future Purchase Intentions Scale

There was a manipulation check in the present study for future purchase intentions. As previously detailed on page 66, subjects were asked how they would respond while shopping if they were not in an artificial laboratory setting but rather in a real world scenario, "If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site." The Pearson correlation between the actual future purchase intentions and its hypothetical counterpart was low for future purchase intentions (r = .40). Hence, the subjects' future purchase intentions may differ between an experimental and a real setting.

Tests of the Model and Hypotheses

This section details the iterative process of arriving at the final structural model, as well as the tests of the research hypotheses.

Structural Model

The structural model is the portion of the full model that accounts for the causal relationships among the latent constructs themselves (Anderson and Gerbing 1988). This section discusses the iterative process of arriving at the final model of the study.

The standardized path coefficients of the various theoretical models mentioned below are shown in Table 33 (Hatcher 1994). The *theoretical model* mentioned in the table was the initial one. Values of the *t* test greater than 1.960 are significant at $p < .05$; 2.576, $p < .01$; and 3.291, $p < .001$.

Table 33. Standardized Path Coefficients (Hatcher 1994)

Dependent Variable/ Independent Variable	Theoretical Model	Revised Model 1	Revised Model 2	Revised Model 3	Revised Model 4
Future Purchase Intentions (F1)					
Control (F3)[1]	.27***	-.02			
Attention focus (F4)	.27***	.09	.09	.11	.10
Cognitive enjoyment (F5)[2]		.58***	.57***	.55***	.55***
Site attitude (F2)					
Cognitive enjoyment (F5)	.59***	.59***	.59***	.58***	.58***
Control (F3)					
Eshopping experience (F6)	.63***	.62***	.62***	.65***	.68***
Interactivity level (V17)[3]					-.18**
Attention focus (F4)					
Eshopping experience (F6)	.46***	.43***	.43***	.44***	.44***
Cognitive enjoyment (F5)					
Eshopping experience (F6)	.75***	.75***	.74***	.69***	.70***
Interactivity level (V17)[4]				.32***	.28***
Eshopping experience (F6)					
Eshopping behavior (V16)	-.13*	-.13*	-.13*	-.14*	-.14*
Interactivity level (V17)	.21***	.20**	.20**	.10	.15*

Note: $N = 310$.
[1] Control (F3) → future purchase intentions (F1) path dropped for revised model 2.
[2] Cognitive enjoyment (F5) → future purchase intentions (F1) path added for revised model 1.
[3] Interactivity level (V17) → control (F3) path added for revised model 4.
[4] Interactivity level (V17) → cognitive enjoyment (F5) path added for revised model 3.
Nonsignificant paths are shaded in gray.
The values of the *t* tests were significant at * $p < .05$; ** $p < .01$; *** $p < .001$.

Initial Theoretical Model

The initial theoretical model (M_t) appears on page 77, with the exception that V15, an indicator variable for eshopping behavior (F6), had been dropped from the model, as a modification to arrive at the final measurement model (M_m). The χ^2/df ratio of 3.65 was unacceptable since it was greater than 3. The RMSEA of .093 was high, which was larger than .08. The NNFI value was .88 which was below .90. These indices indicated poor fit.

More importantly, a chi-square difference test between M_t and M_m resulted in a significant difference of 353.73 – 190.75 = 162.98 > tabulated $\chi^2(19) = 43.82$ ($p < .001$), with a difference of 97 – 78 = 19 degrees of freedom. This showed that M_t provided a significantly worse fit than M_m. Despite these concerns, the paths between any two given constructs were significant, as shown on page 98.

Since M_t provided a poor fit of the data, modifications through a specification search was warranted to reach a more satisfactory model, revised model 1.

Iterative Process of Arriving at the Final Model

This section details the iterative process of arriving at the final model of the study, after the initial theoretical model had been established. Four steps or modifications to the initial theoretical model were undertaken to attain the study's final model.

Step 1: Revised Model 1

In arriving at revised model 1 (M_{r1}), modifications to M_t required looking at the Wald tests (Bentler 1989) to drop any paths without significantly increasing the chi-square value of the model, or the Lagrange multiplier tests (Bentler 1989) to add new paths that would significantly decrease the chi-square value of the model. Wald tests did not reveal any potential paths that could be dropped without affecting the model fit. Alternatively, the Lagrange multiplier test estimated a drop of 63.04 in the chi-square value of M_t if a causal path was added from cognitive enjoyment (F5) to future purchase

intentions (F1). The addition of this causal path was supported with theory and literature, as discussed on page 109. Consequently, this new path was added to create M_{r1}.

The χ^2/df ratio was 2.93, which was barely below the 3:1 desirable fit threshold, but it still provided a better fit over the ratio of M_t of 3.65. The RMSEA was .079, which was slightly less than the .08 acceptable threshold, but it was an improvement over M_t value of .093. M_{r1} showed values for NNFI (.91) and CFI (.93) that were greater than .90 and greater than the M_t values of .88 and .90, respectively. All paths between any two constructs were significant, except for two paths, as shown on page 98: control (F3) and future purchase intentions (F1); attention focus (F4) and future purchase intentions (F1).

The addition of the new path from cognitive enjoyment (F5) to future purchase intentions (F1) was warranted if it did significantly increase the chi-square value of the model. Two chi-square difference tests were conducted to test the model fit. First, a chi-square difference test between M_t and M_{r1} resulted in a significant difference of 353.73 – 281.29 = 72.44 > tabulated $\chi^2(1)$= 10.83 ($p < .001$), with a difference of 97 – 96 = 1 degree of freedom. This showed that M_{r1} with the addition of the new path had a better fit over M_t. The more important test was the second chi-square difference test between M_{r1} and M_m. The difference was 281.29 – 190.75 = 90.54 > tabulated $\chi^2(18) = 42.31$ ($p < .001$), with a difference of 96 – 78 = 18 degrees of freedom. This significant difference indicated that M_{r1} is not adequately accounting for the relationships between the constructs that make-up the structural portion of the model. M_{r1} provided a significantly worse fit than M_m.

Since M_{r1} failed to provide an acceptable fit in comparison to M_m, potential modifications were investigated to arrive at revised model 2.

Step 2: Revised Model 2

A Wald test showed that there was path to delete from M_{r1} to create revised model 2 (M_{r2}), without decreasing the model fit. The resulting nonsignificant increase in chi-square was estimated to be .08. This path was between control (F3) and future purchase intentions (F1). Consequently, this path was deleted to create M_{r2}.

M_{r2} had a χ^2/df ratio of 2.90, which was below 3, but it was slightly better than the ratio of M_{r1} of 2.93. The RMSEA was .078, which was slightly less than the .08 acceptable threshold, but it was barely an improvement over the value of the M_{r1} of .079. Both values for NNFI (.91) and CFI (.93) were greater than .90 and almost matched the values for M_{r1}. All these close values should did not come as a surprise, since both M_{r1} and M_{r2} were not significantly different in terms of fit. All paths between the constructs were significant, except for the path between attention focus (F4) and future purchase intentions (F1), as shown on page 98.

Deleting the path between control (F3) and future purchase intentions (F1) was satisfactory as long as it did not significantly increase the chi-square value of the model. A significant increase meant that M_{r2} had a worse fit than M_{r1}, and the deleted path decreased the model fit since it was an important path. A chi-square difference test between M_{r2} and M_{r1} showed a nonsignificant difference in value of 281.37 – 281.29 = .08 < tabulated $\chi^2(1) = 10.83$ ($p < .001$), with a difference of 97 – 96 = 1 degree of freedom. This reflected that M_{r2} did not provide a worse fit over M_{r1}. This was the desired result in this instance (regarding the deletion of a path). Hence, deleting the control-future purchase intentions path did not decrease the model fit.

A second chi-square difference test between M_{r2} and M_m showed a difference of 281.37 – 190.75 = 90.62 > tabulated $\chi^2(19) = 43.82$ ($p < .001$), with a difference of 97 – 78 = 19 degrees of freedom. This significant difference showed that M_{r2} was not sufficiently accounting for the links between the constructs that constitute the structural portion of the model. Therefore, M_m provided a better fit in comparison with M_{r2}.

Consequently, a specification search entailing modifications to M_{r2} was necessary to reach a better fitting model, revised model 3.

Step 3: Revised Model 3

Since the Wald test showed that there were no potential paths to delete from M_{r2} to create a revised model 3 (M_{r3}), the only alternative was to see the Lagrange multiplier test for additional paths. The Lagrange multiplier test showed that adding a path from

interactivity level (V17) to cognitive enjoyment (F5) resulted in an estimated drop in the chi-square of the model by 38.48. The addition of this causal path was supported by theory and literature, as discussed on page 109. As a result, this new path was added to create M_{r3}.

M_{r3} had a χ^2/df ratio of 2.51, which was below 3, and the ratio was an improvement over the ratio for M_{r2} of 2.90. The RMSEA was .070, which was less than the cutoff point of .08, but it was slightly better than the value of M_{r2} of .078. Both values for NNFI (.93) and CFI (.95) were greater than .90 and exceeded the values for M_{r2}, .91 and .93, respectively. In addition, these same indices outperformed M_{r1} in terms of fit. All paths between the constructs were significant, except for two paths between the following pairs of constructs, as shown on page 98: attention focus (F4) and future purchase intentions (F1), and interactivity level (V17) and eshopping experience (V6).

A chi-square difference test between M_{r3} and M_{r2} showed a significant difference in value of 281.37 – 240.87 = 40.50 > tabulated $\chi^2(1) = 10.83$ ($p < .001$), with a difference of 97 – 95 = 1 degree of freedom. This reflected that M_{r3} provided a better fit over M_{r2}.

A second chi-square difference test between M_{r3} and M_m showed a difference of 240.87 – 190.75 = 50.12 > tabulated $\chi^2(18) = 42.31$ ($p < .001$), with a difference of 96 – 78 = 18 degrees of freedom. This significant difference showed that M_{r3} was not sufficiently accounting for the links between the constructs that constitute the structural portion of the model. Therefore, M_m provided a better fit in comparison to M_{r3}.

Consequently, a specification search entailing modifications to M_{r3} was necessary to reach a better fitting model, revised model 4.

Step 4: Revised Model 4

A Lagrange multiplier test for additional paths was used to modify M_{r3} to create revised model 4 (M_{r4}) since the Wald tests did not show any significant paths to delete from M_{r3} without decreasing the model fit. The Lagrange multiplier test showed that adding a path from interactivity level (V17) to control (F3) dropped the chi-square value

in the model by an estimated 9.55. The addition of this causal path was supported by theory and literature, as discussed on page 109. In turn, this new path was added to create M_{r4}.

For M_{r4}, the χ^2/df ratio was 2.43, which was below 3, and it showed a slightly better fit over M_{r3} with a ratio of 2.51. The RMSEA was .068, which was less than the .08 acceptable threshold, but it was an improvement over the value for M_{r3} of .070. Both values for NNFI (.93) and CFI (.95) were greater than .90 and slightly exceeded the values for M_{r2}. In addition, these same indices outperformed all other previous revised models in terms of fit. All paths between the constructs were significant, except for the path between attention focus (F4) and future purchase intentions (F1), as shown on page 98.

A chi-square difference test between M_{r4} and M_{r3} showed a nonsignificant difference in value of 240.87 – 230.97 = 9.9 < tabulated $\chi^2(1) = 10.83$ ($p < .001$), with a difference of 96 – 95 = 1 degree of freedom. This reflected that M_{r4} did not provide a better fit over M_{r3}. This was not a desired result at the moment; however, the more important test was the result of the second chi-square test.

A second chi-square difference test between M_{r4} and M_m showed a difference of 230.97 – 190.75 = 40.22 < tabulated $\chi^2(17) = 40.79$ ($p < .001$), with a difference of 95 – 78 = 17 degrees of freedom. This nonsignificant difference showed that M_{r4} adequately accounted for the relationships between the constructs that comprised the structural portion of the model. Therefore, M_{r4} had a fit that was not significantly worse than that of M_m. Even though the fit between M_{r4} and M_{r3} was nonsignificant, M_{r3} (unlike M_{r4}) was not acceptable since it provided a significantly worse fit than M_m.

R-square values showed that the respective, *direct* antecedent constructs in the model accounted for 35% in the variance of future purchase intentions (F1); 34% in site attitude (F2); 45% in control (F3); 19% in attention focus (F4); 63% in cognitive enjoyment (F5); and 4% in eshopping experience (F6). For example, both eshopping experience (F6) and interactivity level (V17) directly affected cognitive enjoyment (F5). Both accounted for 63% of the variance in cognitive enjoyment (F6).

James et al.'s (1982) parsimony ratio (PR) is a measure of parsimony of the full model, while James et al.'s (1982) parsimonious normed-fit index (PNFI) is a measure that reflects both fit and parsimony of the full model. PR and PNFI values are used for relative comparisons of models of interest, with higher values being more desirable, for example, in excess of .6 (Netemeyer et al. 1990). Even though the PR values for M_{r4} (.78) was slightly lower than the values for M_{r3} (.80) or any of the values of the other theoretical models, M_{r4} provided a better fit over all these models since the other four models had significantly worse fit than M_m. M_{r4} was not obviously as parsimonious as these other models since it had an additional path over M_{r3} and additional path(s) over any of the other models.

Looking at the fit and parsimony of the structural portion of the model without considering the measurement model requires the evaluation of the following indices: RNFI, RPR, and RPFI. Mulaik et al.'s (1989) relative normed-fit index (RNFI) is a measure of fit; relative parsimony ratio (RPR) is an indicator of parsimony; and relative parsimonious-fit index (RPFI) is a measure of both fit and parsimony. Higher values of the indices are more desirable. Reflecting a better fit in the structural model, M_{r4} had a higher RNFI value (.95) in comparison to the values of M_{r3} (.93) or any of the values of the other three models. In other words, in comparison to the other four models, the structural portion of M_{r4} demonstrated the best fit and was best in explaining the relationships among the constructs. However, since M_{r4} was not as parsimonious as the other models, its RPR (1.13) and RPFI (1.08) values were lower than the values for M_{r3} or any of the values of the other models.

In conclusion, M_{r4} provided the best fit in comparison to any of the other theoretical models. It was selected as the study's final model. M_{r4}, the final model of the study, is shown in Figure 9. As mentioned in Figure 9, the correlation between the two exogenous standardized variables is their covariance. Covariance between two standardized variables is their correlation (Kerlinger and Lee 2000, p. 121).

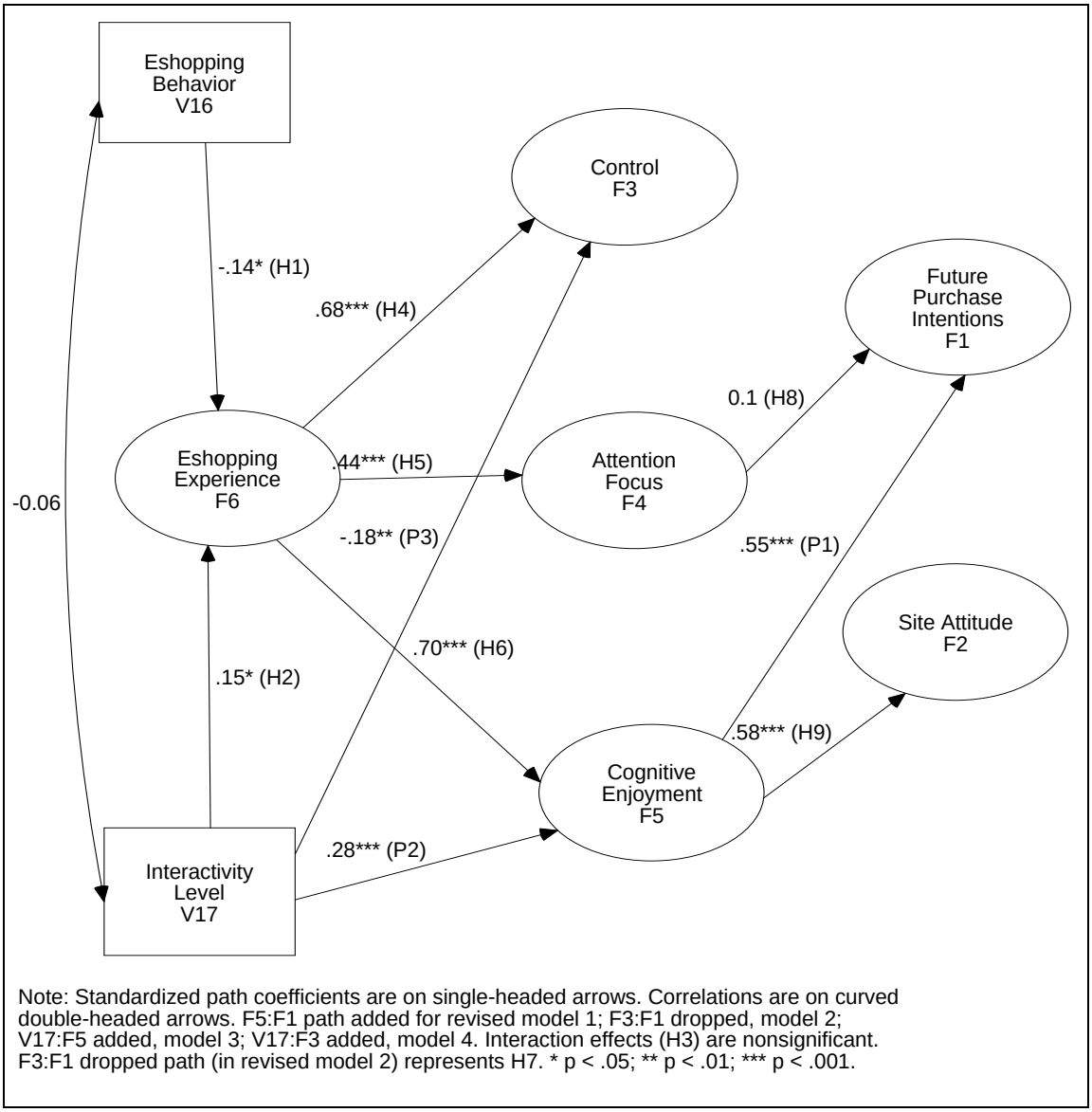

Figure 9. Final Model of the Present Study

Summary of the Various Models and Their Indices

The discussion of the structural equation modeling analysis examined an initial measurement model that is later revised to a final measurement model (M_m). Combining M_m and an initial structural model, an initial theoretical model (M_t) was tested. Consequently, M_t was revised with the addition of one path resulting in revised model 1 (M_{r1}). Revised model 2 (M_{r2}) emerged as a result of M_{r1}, after deleting another causal path. Revised model 3 (M_{r3}) resulted from adding one more path to M_{r2}. Finally, revised model 4 (M_{r4}) was the final model with the addition of one final path to M_{r3}. The iterative changes in the measurement and structural models, leading to the final model of the study M_{r4}, are shown in Table 34.

Table 34. Summary of Iterative Changes in the Full Model

Model		Change from Previous Model
Measurement		
Initial		
Final	M_m	Dropped indicator variable V15 from eshopping experience (F6)
Structural		
Initial theoretical	M_t	
Revised model 1	M_{r1}	Added cognitive enjoyment (F5) → future purchase intentions (F1) path
Revised model 2	M_{r2}	Dropped control (F3) → future purchase intentions (F1) path
Revised model 3	M_{r3}	Added interactivity level (V17) → cognitive enjoyment (F5) path
Revised model 4	M_{r4}	Added interactivity level (V17) → control (F3) path

Care was taken to follow a process of specification search (or a search for modifications that will enhance the fit of the model) that favors locating a path to drop first without affecting the model fit before adding a new path (Bentler and Chou 1987). This sequential process of adding (or dropping) only *one* path at a time in every succeeding revised model minimized data-driven modifications and lack of generalizability of the final model (MacCallum et al. 1992). Each path added was supported from the literature, since any changes made must be theoretically sound and

meaningful (MacCallum et al. 1992). Therefore, this may have minimized the possibility of affecting external validity in the process.

The goodness of fit and parsimony indices for the initial theoretical model and the subsequent, revised four models, along with other relevant, various models, are summarized in Table 35 (adapted from Hatcher 1994). The chi-square and degrees of freedom of the null model and uncorrelated factors model were needed in order to calculate the various indices in the table. The null model contained no relationships among any of the variables, and consequently all covariances and paths among all the variables were deleted. The uncorrelated factors model was the same as the measurement model, except that none of the F variables were allowed to covary (*i.e.* none of the latent F variables are linked to any other latent variable via either a covariance or a path).

Table 35. Fit and Parsimony Indices for the Models (Adapted from Hatcher 1994)

	Full Model								Structural Model		
Model	χ^2	*df*	χ^2/df	RMSEA	NNFI	CFI	PR	PNFI	RNFI	RPR	RPFI
Null model	2762.30	120									
Uncorrelated	655.11	93	7.04	.140	.726	.787	.775	.591	.000	1.000	.000
Theoretical	353.73	97	3.65	.093	.880	.903	.808	.705	.677	1.267	.857
Revised 1	281.29	96	2.93	.079	.912	.930	.800	.719	.837	1.200	1.005
Revised 2	281.37	97	2.90	.078	.914	.930	.808	.726	.839	1.267	1.063
Revised 3	240.87	96	2.51	.070	.932	.945	.800	.730	.928	1.200	1.114
Revised 4	230.97	95	2.43	.068	.935	.949	.792	.725	.948	1.133	1.075
Measurement	190.75	78	2.45	.068	.934	.957	.650	.605	1.000	.000	.000

Note: $N = 310$. $\chi^2/df = \chi^2$/degrees of freedom; RMSEA = root mean square error of approximation; NNFI = non-normed-fit index; CFI = comparative fit index; PR = parsimony ratio; PNFI = parsimonious normed-fit index; RNFI = relative normed-fit index; RPR = relative parsimony ratio; RPFI = relative parsimonious-fit index.

Tests of the Hypotheses

This section discusses any possible gender effects and the additional causal links resulting from the structural equation modeling analysis, along with an examination of the tests of the hypotheses of the model. The section concludes with an analysis of the results of the experimental factors in the study.

MANOVA showed there was a significant multivariate effect for eshopping behavior, Wilks' lambda = .86, $F(12, 598) = 4.00$, $p < .0001$. Interactivity level had a significant multivariate effect, Wilks' lambda = .88, $F(6, 299) = 6.83$, $p < .0001$. MANOVA was run for blocked design, with eshopping behavior as the blocking factor. The dependent variables were all the endogenous variables: eshopping experience, control, attention focus, cognitive enjoyment, future purchase intentions, and site attitude. For a given dependent variable of interest, the results for its univariate *F* statistic was reported where appropriate in the discussion below, as well as on page 115. Means and standard deviations for all the variables in the model by factor levels for each independent variable are shown in Table 36.

Table 36. Descriptive Statistics for the Variables by Factor Level

Factor Levels	Eshopping Experience		Control		Attention Focus		Cognitive Enjoyment		Purchase Intentions		Site Attitude	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Exp.	5.04	.88	5.54	.79	3.75	1.26	4.80	.99	4.07	1.39	5.00	1.14
Util.	4.29	1.24	5.11	1.00	3.25	1.27	3.63	1.26	3.32	1.49	4.17	1.33
Mix.	4.58	1.06	5.34	.81	3.72	1.22	4.23	1.11	3.72	1.36	4.75	1.14
Low	4.50	1.03	5.39	.72	3.55	1.13	3.85	1.06	3.62	1.31	4.53	1.10
High	4.75	1.10	5.25	1.02	3.66	1.37	4.62	1.19	3.79	1.50	4.81	1.29

Note: The independent variables are represented by their corresponding factor levels: eshopping behavior (exp. = experiential, util. = utilitarian, and mix. = mixed) and interactivity level (low and high).

The results of the research hypotheses are shown in Table 37. The standardized path coefficients appear in the last column of the table. A graphical representation of the paths is shown on page 105. The absolute values of the magnitudes of the causal relationships between the constructs can be interpreted as *small* or *weak* effects for values less than .10; around .30, *medium* or *moderate*; and greater than .50, *large* or *strong* (Kline 1998).

Table 37. Summary of Hypotheses Results for the Final Model

No.	Path	Hypothesis			Signif.	Support
H1	V16→F6	Eshopping behavior	→	Eshopping experience	-.14*	No
H1a		Mixed > Experiential				
H1b		Exper. > Utilitarian				
H2	V17→F6	Interactivity level	→	Eshopping experience	.15*	Yes
		High > Low				
H3	Interaction	Behavior X Interactivity	→	Eshopping experience	ns[1]	No
H3a		Mixed and high				
H3b		Experiential and high				
H3c		Utilitarian and low				
H4	F6→F3	Eshopping experience	→	Control	.68***	Yes
H5	F6→F4	Eshopping experience	→	Attention focus	.44***	Yes
H6	F6→F5	Eshopping experience	→	Cognitive enjoyment	.70***	Yes
H7	F3→F1	Control	→	Purchase intentions	Drop[2]	No
H8	F4→F1	Attention focus	→	Purchase intentions	.10	No
H9	F5→F2	Cognitive enjoyment	→	Site attitude	.58***	Yes
		Additional Causal Links				
P1[3]	F5→F1	Cognitive enjoyment	→	Purchase intentions	.55***	Yes
P2[4]	V17→F5	Interactivity level	→	Cognitive enjoyment	.28***	Yes
		High > Low				
P3[5]	V17→F3	Interactivity level	→	Control	-.18**	Yes

Note: All effects are based on structural equation modeling, except for the effects of the factor levels of the exogenous or independent variables (e.g. interactivity level: low versus high). The effects of these factor levels are based on Tukey's HSD test, which is appropriate to interpret given that both the multivariate effect of the independent variable and univariate effect for a given dependent variable are both significant (Hatcher and Stepanski 1994, pp. 286-287; Stevens 1996, pp. 196-198, 203).

[1] The multivariate interaction effects were nonsignificant based on MANOVA, as detailed on page 115.
[2] Control (F3) → future purchase intentions (F1) dropped for revised model 2 and was nonsignificant.
[3] Cognitive enjoyment (F5) → future purchase intentions (F1) added for revised model 1.
[4] Interactivity level (V17) → cognitive enjoyment (F5) added for revised model 3.
[5] Interactivity level (V17) → control (F3) added for revised model 4.
Nonsignificant (ns) paths are shaded in gray
The values of the *t* tests were significant at * $p < .05$; ** $p < .01$; *** $p < .001$.

Gender Effects

Out of 310 subjects, female subjects represented 195 or 63% of the entire sample, while male participants represented 115 or 37% of the sample. Given there are more female than male subjects, gender have been concern on the effects in the model. Hence, it was necessary to examine its effect in the model. Based on MANOVA, gender effects

are displayed in Table 38, which showed the results for the study's model, with gender added as an independent variable. The dependent variables were all the endogenous variables: eshopping experience, control, attention focus, cognitive enjoyment, future purchase intentions, and site attitude. There was no significant multivariate effect for gender in the model, Wilks' lambda = .98, $F(6, 293) = .76$, $p = .61$. Therefore, the gender gap or size discrepancy should not affect the results of the study.

Table 38. MANOVA Summary Table for Gender Effects

Source	Wilks' Lambda	df_{num} [1]	df_{den}	*F*
Eshopping Behavior (A)	.88	12	586	3.08*
Interactivity Level (B)	.90	6	293	5.57*
A X B Interaction	.94	12	586	1.53
Gender (C)	**.98**	**6**	**293**	**.76**
A X C Interaction	.95	12	586	1.38
B X C Interaction	.98	6	293	1.22
A X B X C Interaction	.96	12	586	.42

Note: $N = 310$.
[1] *df* = degrees of freedom for multivariate *F* derived from Wilks' lambda (for the numerator and denominator, respectively).
* $p < .001$.

Additional Causal Links

Three causal links were added as a result of the structural equation modeling analysis and results. The new paths can be explained using flow theory, supporting literature, and other relevant or competing theories.

The first causal path added was between cognitive enjoyment and future purchase intentions. Cognitive enjoyment is a flow dimension comprised of curiosity and intrinsic interest (Webster et al. 1993). Intrinsic interest is doing an act for its own sake as its own reward. When users are in a flow state, changes in attitudes and behaviors result (Csikszentmihalyi 1990, 2000; Trevino and Webster 1992). As users are navigating a site, they experience feelings of enjoyment in this flow state (Childers et al.

2001). Consequently, they may intend to purchase an item from a site in the future. This occurs since feelings of shopping enjoyment and concentration (important attributes of a flow experience) lead to increased likelihood of return visits to a web site and changes in behavior, such as purchase intentions (Koufaris 2002). Cognitive enjoyment had a significant and strong positive effect (coefficient = .55, $p < .001$) on future purchase intentions, as shown on page 109. This supporting literature and structural equation modeling analysis suggested the following proposition for the additional causal link:

> P1: The cognitive enjoyment dimension of flow increases the likelihood of users' future purchase intentions of a product online.

A second new path was introduced. A relationship between interactivity level and cognitive enjoyment was added as a result of the analysis. Sensory stimulation through interaction with the environment results in elevated levels of cognition and emotions (Csikszentmihalyi 1990, 2000; Webster et al. 1993). In the context of eshopping, this interaction manifests itself when users utilize a system's interface and the interactive features of a web site. This interactivity is an important determinant of flow (Novak et al. 2000). Interactivity as facilitated by a web site directly contributes to flow's enjoyment dimension, as evidence in a study examining an online tourism site (Skadberg and Kimmel 2004). Furthermore, interactivity has a consistently significant impact on curiosity and intrinsic interest, which jointly are called cognitive enjoyment by Webster et al. (1993), based on survey administered to users working in or studying information management (Huang 2003). The relationship between interactivity level and cognitive enjoyment was statistically significant, moderate, and positive (coefficient = .28, $p < .001$), as shown on page 109. Furthermore, given the significant multivariate effect of interactivity level and the significant univariate effect for cognitive enjoyment, $F(1, 304) = 30.46$; $p < .0001$, Tukey's HSD test was interpretable and showed that users of high interactivity level web sites ($M = 4.62$) significantly increased their cognitive enjoyment than users in the low interactivity level sites ($M = 3.85$) did ($p < .05$), since high interactivity level sites are more stimulating. Thus, the following proposition for the

additional causal path was examined, based on flow theory and the structural equation modeling analysis:

> P2: High interactivity level web sites increase the cognitive enjoyment component of flow more than low interactivity level websites do.

A third newly created path was added as a result of the analysis between interactivity level and control. As users use the interactive features of a web site, they are controlling the interface via the mouse and screen objects, such as buttons, toolbars, menus, etc. Coupled with heightened concentration and focus on their eshopping task, they may achieve a state of flow as a result of their control over this interaction with the site and feedback from the system via search query results or site navigation. Interactivity has a consistently significant impact on flow's control dimension, based on survey administered to users working in or studying information management (Huang 2003). An important determinant of flow is interactivity (Novak et al. 2000). This interactivity level to control path was statistically significant and a weak *negative* one (coefficient = -.18, $p < .01$), as shown on page 109. This weak and negative effect was explained using cognitive load theory (Sweller 1988), limited capacity information processing theory (Lang 1995, 2000), and information processing theory (Miller 1956), as discussed in the section, which begins on page 118. Based on the literature and the structural equation modeling analysis, the following proposition for the additional causal link was posited:

> P3: Interactivity level *decreases* the control element of flow.

Therefore, interactivity level negatively influenced (decreased) the sense of control over the interaction. It is noteworthy to mention though that the magnitude of this negative relationship was weak (coefficient = -.18, $p < .01$). It was not appropriate to interpret the effects of the factor levels (low or high) of interactivity level since the value of the univariate F statistic for the effect of interactivity level on control was nonsignificant, $F(1, 304) = .78$, $p = .38$.

Results of Eshopping Behavior and Interactivity Level Effects

It was predicted that eshopping behavior increased eshopping experience (H1), with mixed behavior having the highest levels (H1a) followed by experiential behavior (H1b) over utilitarian. Surprisingly, eshopping behavior had a significant and weak *negative* effect (coefficient = -.14, $p < .05$) on eshopping experience, as shown on page 109. Given the significant multivariate effect of eshopping behavior and the significant univariate effect on eshopping experience, $F(2, 304) = 9.04$, $p = .0002$, Tukey's HSD test was interpretable and indicated that experiential users ($M = 5.04$) achieved significantly more *negative* levels of eshopping experience than utilitarian ($M = 4.29$) and mixed ($M = 4.58$) users did ($p < .05$). There was no significant difference between utilitarian and mixed users in terms of eshopping experience ($p > .05$). These results did not support H1, H1a, and H1b.

It was proposed that interactivity level enhanced eshopping experience, with high interactivity level exceeding low interactivity level (H2). The relationship between interactivity level and eshopping experience was statistically significant, weak, and positive (coefficient = .15, $p < .05$), as shown on page 109. Given the significant multivariate effect of interactivity level and the significant univariate effect for eshopping experience, $F(1, 304) = 5.43$, $p = .02$, Tukey's HSD test was interpretable and showed that high interactivity level web sites ($M = 4.75$) increased eshopping experience more in comparison to low interactivity level web sites ($M = 4.50$) ($p < .05$). These results supported H2.

Results of Eshopping Experience Effects on Flow Experience

It was hypothesized that eshopping experience increased control (H4), attention focus (H5), and cognitive enjoyment (H6) of the flow experience, respectively. The paths were statistically significant, strong, and positive for each of control (coefficient = .68, $p < .001$) and cognitive achievement (coefficient = .70, $p < .001$), while moderate in magnitude of effect in relation to attention focus (coefficient = .44, $p < .001$), as shown on page 109. Hence H4, H5, and H6 were supported.

Results of Flow Effects on Consequences of Eshopping

It was predicted that control increased future purchase intentions (H7). This relationship was dropped as a result of iteratively creating the final model. This path was nonsignificant (coefficient = -.28, $p > .05$), as shown on page 109. Since H7 was dropped (and has a nonsignificant effect), the hypothesis was not supported.

It was proposed that attention focus increased future purchase intentions (H8). The relationship between attention focus and future purchase intentions was statistically nonsignificant (coefficient = .10, $p > .05$), as shown on page 109. H8 was not supported.

The effect of cognitive enjoyment on site attitude was tested in H9. This cognitive enjoyment to site attitude path was a statistically significant and strong positive one (coefficient = .58, $p < .001$), as shown on page 109. Combining the results of the additional causal link and the original hypothesis, cognitive enjoyment had a positive effect on site attitude (H9) and future purchase intentions (P1). P1 had been discussed in detail in the section, which begins on page 109.

Analysis of Experimental Factors

MANOVA results are shown in Table 39. There was no significant multivariate (eshopping behavior X interactivity level) interaction effect, Wilks' lambda = .94, $F(12, 598) = 1.59$, $p = .09$. Since there was no interaction multivariate effect, there was no support for H3, H3a, H3b, and H3c. In addition, when there is no interaction effect, it is appropriate to interpret the main effects of the independent variables. MANOVA also showed that in the model there was a significant multivariate effect for eshopping behavior, Wilks' lambda = .86, $F(12, 598) = 4.00$, $p < .0001$. Interactivity level had a significant multivariate effect, Wilks' lambda = .88, $F(6, 299) = 6.83$, $p < .0001$. MANOVA is run for blocked design, with eshopping behavior as the blocking factor. The dependent variables were all the endogenous variables: eshopping experience, control, attention focus, cognitive enjoyment, future purchase intentions, and site attitude. The means and standard deviations of the variables in the model were shown previously by factor level or condition for the independent variables on page 108.

Table 39. MANOVA Summary Table for the Overall Effects in the Model

Source	Wilks' Lambda	df_{num} [1]	df_{den}	*F*
Eshopping Behavior (A)	.86	12	598	4.00*
Interactivity Level (B)	.88	6	299	6.83*
A X B Interaction	.94	12	598	1.59

Note: $N = 310$.
[1] *df* = degrees of freedom for multivariate *F* derived from Wilks' lambda (for the numerator and denominator, respectively).
* $p < .001$.

Since the independent variables had shown a significant multivariate effect, it was reasonable to observe the univariate statistics (Hatcher and Stepanski 1994, p. 286), like separate ANOVAs run on composite average scores of the scale items, given the univariate effects are also significant. Separate ANOVAs were run, and the results of the effects of having eshopping behavior and interactivity level as independent variables, when all other variables in the model are treated each and separately as dependent variables are shown in Table 40.

Table 40. Results of Running Separate ANOVAs on Each Variable

Independent Variables Source	*F* of the Dependent Variables					
	Eshopping Experience	Control	Attention Focus	Cognitive Enjoyment	Purchase Intentions	Site Attitude
Eshopping Behavior (A)	9.04***	4.56**	4.10*	19.44***	5.20**	10.81***
Interactivity Level (B)	5.43*	.78	1.34	30.46***	.91	5.10*
A X B Interaction	1.84	.79	2.57	1.72	.41	1.77

Note: $N = 310$.
The table shows the results of running separate ANOVAs on each variable in the model separately as a dependent variable with eshopping behavior and interactivity level as independent variables.
Hypothesized effects in the model (corresponding to the hypotheses: H1, H2, and H3; and the additional causal links: P2 and P3) are shaded in gray.
* $p < .05$; ** $p < .01$; *** $p < .001$.

The results of effects under both ANOVA (taken from page 115) and structural equation modeling (reported on page 109) are shown in Table 41. The relationships that

could be compared were only the hypothesized, direct relationships from the exogenous variables (eshopping behavior and interactivity level) to all other variables, without mediating effects since ANOVA will not test mediating relationships. Results under both statistical techniques were consistent, except for one additional causal link, P3, between interactivity level and control. Under both procedures, the results of the other hypotheses (H1, H2, and additional causal link P2) showed significant effects ($p < .05$), and H3 showed a nonsignificant effect ($p < .05$). A simple explanation for the only discrepancy in result (P3) is the scope of the techniques and number of variables and relationships in their respective models. Regarding scope, ANOVA is a univariate technique, while SEM is a multivariate method. Unlike ANOVA, the SEM model of the present study was much more complex and took into account more variables and relationships, unlike ANOVA which was testing the relationships of only two independent variables (eshopping behavior and interactivity level) on only one dependent variable (control) for H3. Furthermore, ANOVA did not take into account the effects of mediating variables, like SEM does, which included eshopping experience as a mediator between the interactivity level and control for P3.

Table 41. Comparison of Hypothesized Effects in ANOVA and SEM

No.	Path	Hypotheses			Significant Under? ANOVA	SEM
H1	V16→F6	Eshopping behavior (A)	→	Eshopping experience	Yes***	Yes*
H2	V17→F6	Interactivity level (B)	→	Eshopping experience	Yes*	Yes*
H3	Interaction	A X B	→	Eshopping experience	ns	ns
Additional Causal Links						
P2	V17→F5	Interactivity level	→	Cognitive enjoyment	Yes***	Yes***
P3	V17→F3	Interactivity level	→	Control	ns	Yes**

Note: Nonsignificant (ns) paths are shaded in gray.
* $p < .05$; ** $p < .01$; *** $p < .001$.

CHAPTER VI

CONCLUSION

This chapter concludes the dissertation with a discussion of the results, limitations of the study, contributions of the research, and recommendations for future research.

Discussion of the Results

The causal relationships in the model showed that eshopping behavior had a weak negative effect, and interactivity level had a weak positive effect, on eshopping experience. Experiential eshopping behavior decreased eshopping experience more than mixed or utilitarian eshopping behavior did. The latter two behaviors were not significantly different from each other in terms of eshopping experience. High interactivity level web sites increased eshopping experience more than low interactivity level sites did. Interactivity level had a weak negative effect on flow's control dimension and a moderate positive effect on flow's cognitive enjoyment component. High interactivity level sites moderately increased cognitive enjoyment more than low interactivity level sites did. There were no interaction effects of eshopping behavior and interactivity level on eshopping experience. Eshopping experience strongly and positively influenced flow experience in terms of control and cognitive enjoyment, and moderately impacted attention focus. Cognitive enjoyment had a strong positive effect on site attitude and future purchase intentions. However, control and attention focus did not significantly affect future purchase intentions. The study found an indirect effect of eshopping behavior on site attitude, instead of the traditional effect of attitude on behavior based on the theory of reasoned action and technology acceptance model.

Eshopping Behavior and Interactivity Level Effects

The effects of the exogenous variables, eshopping behavior and interactivity level, on the variables in the model are examined in this section.

Eshopping Behavior Effects on Eshopping Experience

The results did not support H1, H1a, and H1b. In other words, eshopping behavior had a significant and weak *negative* effect (coefficient = -.14, $p < .05$) on eshopping experience, with experiential users ($M = 5.04$) achieving significantly more negative levels of eshopping experience than utilitarian ($M = 4.29$) and mixed ($M = 4.58$) users did ($p < .05$). There was no significant difference between utilitarian and mixed users in terms of eshopping experience ($p > .05$). An explanation for the negative effect for H1 may be that the study is examining the indirect effect of eshopping behavior on site attitude (as partially mediated by eshopping experience), a reverse relationship to the traditional attitude-behavior effect in the theory of reasoned action or technology acceptance model. A detailed analysis of this reverse relationship is discussed in the section, which starts on page 121. Regarding the unsupported result of H1a and H1b, it is possible that experiential users had a more negative eshopping experience due to the fact they tend to spend much more time in exploratory behavior. They may feel unfulfilled since they are not achieving a specific task or a goal like mixed users (H1a) or utilitarian users (H1b).

Interactivity Level Effects in the Model

Interactivity level enhances eshopping experience, with high interactivity level exceeding low interactivity level (H2). The relationship between interactivity level and eshopping experience was statistically significant, weak, and positive (coefficient = .15, $p < .05$). High interactivity level web sites ($M = 4.75$) had a significantly more positive eshopping experience in comparison to low interactivity level web sites ($M = 4.50$) ($p < .05$). These results are consistent with previous literature. Highly interactive features in a web site (versus low interactive features) induce users to experience a site in a more positive way (Schmitt 1999, 2003). For example, visual stimulation in 3D images results in more enjoyable eshopping (Li et al. 2001). Increased levels of interactive features in a web site create a positive experience and attitude towards a web site (Coyle and Thorson 2001; Teo et al. 2003).

Two additional causal links were added that pertain to interactivity level. The first path was to cognitive enjoyment (P2) and the second was to control (P3). The relationship (P2) between interactivity level and cognitive enjoyment was statistically significant, moderate, and positive (coefficient = .28, $p < .001$). Users of high interactivity level web sites ($M = 4.62$) reported significantly greater levels of cognitive enjoyment than users in the low interactivity level sites ($M = 3.85$) did ($p < .05$). This is likely because high interactivity level sites were more stimulating. Interactivity is an important determinant of flow (Novak et al. 2000). Interactivity as facilitated by a web site directly contributes to flow's enjoyment dimension, as evidenced in a study examining an online tourism site (Skadberg and Kimmel 2004). Furthermore, interactivity has a consistently significant impact on curiosity and intrinsic interest, which jointly are called cognitive enjoyment by Webster et al. (1993), based on a survey administered to users working in or studying information management (Huang 2003). Consequently, the direction of P2 is in the expected direction (positive).

For the second additional causal path (P3) involving interactivity level, the direction of P3 was not in the expected direction. The result of P3 is that interactivity level *decreased* the control element of flow. This interactivity level to control path was statistically significant and a weak *negative* one (coefficient = -.18, $p < .01$). This weak and negative effect can be explained using cognitive load theory (Sweller 1988), limited capacity information processing theory (Lang 1995, 2000), and information processing theory (Miller 1956).

Cognitive load theory (Sweller 1988) defines cognitive load as the amount of working memory needed to solve a problem. Working memory is short-term memory that stores current information being processed, comparable in function to random access memory (RAM) in computers. According to the theory, whenever individuals learn something new, they build schemata (singular schema), or combinations of elements that combine several elements into a holistic experience. This becomes essentially a knowledge-base from which to draw information. For example, experts are better than novices in solving problems because they have a schema bank over a lifetime

of learning that allows them to recognize familiar patterns in problems and solve them quickly. This process of learning can be disrupted if working memory is overloaded failing to digest the new information for proper schema acquisition. Likewise, limited capacity information processing theory (Lang 1995, 2000) proposes that proper processing of information is necessary for encoding, storing, and ultimately retrieving this information. However, processing is disrupted either when the recipient allocates fewer resources to the message than necessary, or the message demands more resources than the recipient has to designate to the task. Both theories draw from a seminal and foundational theory in cognitive psychology, information processing theory (Miller 1956), which handles *chunking* and short-term memory capacity. According to the theory, short-term memory can handle only seven (or five to nine) pieces of information or *chunks* at one time. A chunk is a meaningful unit or single element.

In the context of the additional causal link (P3) between interactivity level and control, users carry out a problem-solving task or eshopping task, which stipulates finding a suitable item of clothing within a set time frame to potentially create an outfit, using interface features from landsend.com. These interactive dimensions are media vividness (*My Virtual Model*), customization (*Lands' End Custom Clothing*), and personalization (*My Personal Shopper*), as well as textual elements (product descriptions) and graphical elements (images of products). The combination of all these many features may have overwhelmed the users since the features demand high cognitive load (cognitive load theory). Consequently, the users may not have felt in control of the interaction with landsend.com. Using these interactive features either required more resources, or the users did not give enough cognitive resources to carry out the eshopping task using these highly interactive and potentially overwhelming features (limited capacity information processing theory and information processing theory). Specifically in the context of flow theory, the users may feel anxiety if the site features are too challenging, or the interface is too confusing that it exceeds the users' online skills (Csikszentmihalyi 1975, 2000) or patience. Therefore, interactivity level negatively influenced (decreased) the sense of control over the interaction. It is

noteworthy to mention though that the magnitude of this negative relationship was weak (coefficient = -.18, p < .01). It is not appropriate to interpret the effects of the factor levels (low or high) of interactivity level since the value of the univariate *F* statistic for the effect of interactivity level on control was nonsignificant, $F(1, 304) = .78$, $p = .38$.

Combining the results of the additional causal links and the original hypotheses, interactivity level positively affected eshopping experience (H2), positively influenced cognitive enjoyment (P2), and negatively impacted control (P3). In both H2 and P2, high interactivity level achieved higher levels of eshopping experience and cognitive enjoyment more over low interactivity level, respectively.

Eshopping Experience Effects on Flow Experience

Second-order confirmatory factor analysis revealed that eshopping experience was actually a unidimensional first-order factor and not a multidimensional one with three separate dimensions of sensory, affective, and cognitive eshopping experiences, based on the present study's analysis of the Schmitt (1999) eshopping experience scale.

Eshopping experience increased control (H4), attention focus (H5), and cognitive enjoyment (H6) dimensions of the flow experience. The paths were statistically significant, strong, and positive for each of control (coefficient = .68, $p < .001$) and cognitive achievement (coefficient = .70, $p < .001$), while moderate in magnitude of effect in relation to attention focus (coefficient = .44, $p < .001$). Hence H4, H5, and H6 were supported. Computer interactions resulting from exploratory behavior or experiences can lead to flow, in terms of control, attention focus, and cognitive engagement (Webster et al. 1994). These experiences of computer or online users, either for eshopping or fun, are heightened in a state of flow (Agarwal and Karahanna 2001; Novak et al. 2000).

Flow Experience Effects on Consequences of Eshopping

The first hypothesized relationship between a dimension of flow experience (control) and a consequence of eshopping (future purchase intentions) was dropped as a result of iteratively creating the final model. This path was nonsignificant (coefficient = -

.28, $p > .05$). Hence, control over the user interface of a site, like landsend.com, does not lead to future purchase intentions of a product from the site. Since H7 was dropped (and has a nonsignificant effect), the hypothesis was not supported.

Likewise, attention focus did not significantly increase future purchase intentions (H8). The relationship between attention focus and future purchase intentions was statistically nonsignificant (coefficient = .10, $p > .05$). Being focused on and immersed in the shopping task at hand or navigation of the site does not lead to future purchase intentions. Hence, H8 was not supported.

Cognitive enjoyment had two effects in the model corresponding to H9 and P1. The effect of cognitive enjoyment on site attitude was tested in H9. This cognitive enjoyment to site attitude path was a statistically significant and strong positive one (coefficient = .58, $p < .001$). In addition a new causal path between cognitive enjoyment and future purchase intentions was added (P1), and cognitive enjoyment had a significant and strong positive effect (coefficient = .55, $p < .001$) on future purchase intentions. Combining the results of the effects pertaining to the original hypothesis and the additional causal link and the, cognitive enjoyment had a positive effect on site attitude (H9) and future purchase intentions (P1), respectively.

The results for the effects of cognitive enjoyment on site attitude (H9) and future purchase intentions (P1) are consistent with the literature. Users while shopping may formulate a positive attitude towards the site or intend to purchase an item from a site in the future. This occurs since feelings of shopping enjoyment and concentration (important attributes of a flow experience) lead to increased likelihood of return visits to a web site and changes in behavior, such as purchase intentions (Koufaris 2002). While users are in this flow state, they are more likely to learn about the content of the site, and this learning results in changes in attitudes and behaviors, such as positive site attitudes and revisits (Skadberg and Kimmel 2004). (Cognitive) enjoyment is a significantly positive predictor of attitude toward online shopping (Childers et al. 2001). Cognitive absorption, a construct based on flow dimensions such as control, curiosity, attention,

and heightened enjoyment among others, is a significant predictor of attitudes (perceived usefulness and perceived ease of use of a technology) (Agrawal and Karahanna 2001).

The results of H7, H8, H9, and P1 require further analysis. Two effects of flow on consequences of eshopping were nonsignificant (H7 and H8), and two effects were significant (H9 and P1). Both nonsignificant effects dealt with future purchase intentions, while both significant effects dealt with the effect of cognitive enjoyment on site attitude (H9) and future purchase intentions (P1). An explanation for why future purchase intentions were nonsignificant under control and attention focus may had to do with the lack of realism in the laboratory environment.

Subjects were asked about how they would respond while shopping if they were not in an artificial laboratory setting but rather in a real world scenario, as previously discussed in the section, which starts on page 66. The Pearson correlations between the actual consequences of eshopping and their hypothetical counterparts were low for future purchase intentions (r = .40) and high for site attitude (r = .71). The subjects' future purchase intentions may differ between an experimental and a real setting. On the other hand, the attitudes they form towards the site seem likely to be similar regardless of whether they are participating in a research study or shopping in a real environment.

H8 showed there was a nonsignificant effect between attention focus and future purchase intentions. The indicator variables for attention focus failed to achieve at least the neutral value of 4.0 on the Likert scale, V9 (M = 3.55, SD = 1.49) and V10 (M = 3.66, SD = 1.37).The nonsignificant effect may be due to the fact that some distractions occurred during the laboratory session, such as subjects arriving late, asking questions during the session, or simply causing noise as they leave the session. As previously discussed in the section (which starts on page 118), cognitive load theory (Sweller 1988), limited capacity information processing theory (Lang 1995, 2000), and information processing theory (Miller 1956) shed light on this nonsignificant relationship. The various interactive features of landsend.com may result demand a high cognitive load on the subjects, and consequently the subjects are not able to concentrate or achieve attention focus to actually decide to intend to purchase an item in the future.

H9 and P1 showed that cognitive enjoyment led to positive site attitude and increased likelihood of future purchase intentions, respectively. This positive site attitude may or may not lead to future purchase intentions, which was not a relationship investigated in the current study. However, analysis warrants further examination since this attitude-intention link, coupled with the indirect effect of behavior (eshopping behavior is an exogenous variable with indirect, separate effects on both site attitude and future purchase intentions) is a foundational relationship in the theory of reasoned action or TRA (Fishbein 1967; Fishbein and Ajzen 1975) and the technology acceptance model or TAM (Davis 1989; Davis et al. 1989).

A post-hoc analysis that posited a path between site attitude to future purchase intentions showed the path was nonsignificant (coefficient = -.0003, $p > .05$). First the nonsignificance of this investigated relationship is explained, followed by a discussion for its negative direction.

One explanation for having a positive site attitude but not necessarily intending to have future purchases can be explained using TRA. TRA proposes that it is not the attitude towards the object or product but towards the behavior that counts. Users may have favorable site attitudes towards landsend.com and its products but unfavorable site attitudes towards the purchase of those items (behavior) due to price (Assael 1998). With a median household income of over $60,000 and an age range of mostly between 35-54 years old, two-thirds of Lands' End's target consumers are in professional or managerial occupations (Kay 2004). Hence, the items sold on landsend.com may have been overpriced to the study's sample of subjects, who are predominantly college students in their early twenties and with lower incomes. This demographic gap may also explain why very few of the subjects visited landsend.com before their experimental session. Eighty-eight percent of the sample or 274 subjects had never visited the site before the experiment, while 12% or 36 subjects did. However, this lack of prior visit is useful in measuring the impact of interactivity level, since the participants (especially in the low interactivity level treatment) have not been previously exposed to the site and subsequently its highly interactive features. However, in response to the implication of

the profile of Lands' End target consumer, college students purchase brand name apparel and may not be outside the price range of Lands' End. Furthermore, the aforementioned target consumer profile pertains primarily to Lands' End and not necessarily to landsend.com.

Another pertinent aspect of the relationships of TRA's or TAM's attitude-intention-behavior versus the present study's model is the negative direction of the relationships. The negative direction of the link associated with H1 (from eshopping behavior to eshopping experience), and the investigated, post-hoc negative relationship (between site attitude and future purchase intentions) warrant further discussion. The former link can be examined in the overall model as the indirect effect of eshopping behavior on the consequences of eshopping (site attitude and future purchase intentions) as mediated by eshopping experience and flow experience. However, since behavior precedes (site) attitude and intention (to purchase or buy), the relationship is a reverse one, and consequently this may help explain the negative direction of (H1), and subsequent, negative direction of the investigated, post-hoc relationship between site attitude and future purchase intentions. Furthermore, the correlations between eshopping behavior and each of the consequences of eshopping were negative, as shown on page 79: future purchase intentions, -.06; and site attitude, -.04.

In essence, the research model postulated the indirect effect of eshopping behavior on site attitude, a reverse relationship in contrast to the traditional attitude-behavior relationship, addressed by studies implementing theories such TRA (Fishbein 1967; Fishbein and Ajzen 1975) or TAM (Davis 1989; Davis et al. 1989). Explaining this reverse relationship, Assael (1998) cites three theories of how behavior can affect subsequent attitude postpurchase: cognitive dissonance theory (Festinger 1957), Sherif's social judgment theory (Sherif et al. 1965), and Krugman's theory (1965) of passive learning. In addition, Bem's (1967, 1972) self-perception theory can be used to explain this reverse relationship.

First, the theory of cognitive dissonance is an example of how behaviors can influence attitudes (Assael 1998). According to cognitive dissonance theory (Festinger

1957), a conflict occurs when an individual's attitudes and behaviors are not congruent. The individual tries to reduce this conflict by changing one's opinion to conform to the outcome of one's behavior. For example, if consumers buy an Apple Macintosh computer instead of a PC, they may later have doubts about the purchase when they reevaluate the alternative platform. To reduce this dissonance in cognition or postpurchase conflict, they may extensively highlight the attributes of their current platform to reduce this discrepancy in belief or opinion. Hence, the behavior (purchase) is reinforced and results in more positive feelings (attitude) postpurchase about the chosen decision.

Second, Sherif's social judgment theory (Sherif et al. 1965) can explain how behavior can impact attitude (Assael 1998). A recipient's judgment on a persuasive message depends on one's position on the topic. There are three categories of positions: latitude of acceptance (range of acceptable positions), latitude of rejection (range of objectionable positions), and latitude of noncommitment (range of neutral positions). An assimilation effect occurs when recipients of a message exaggerate the degree of agreement between their beliefs and the message, since they agree with the message. However, a contrast effect occurs when the recipients of a message overstate the difference between their beliefs and the message, since they disagree with the message. Small to moderate discrepancies between the recipient's beliefs and the message's position (within the latitude of acceptance and noncommitment) will cause changes in attitude, but large discrepancies (within the latitude of rejection) will not. Simply put, individuals filter in and out messages they agree with or disagree with, respectively, and they will view a message they agree with more positively than it really is, and vice versa.

For example, when expectations regarding a decision or behavior are not met, dissatisfaction (or disconfirmation of expectations) regarding the behavior occurs (Assael 1998). According to social judgment theory, when users of a web site are dissatisfied somewhat with relatively infrequent but long download times, their attitudes will change slightly (attitude) to accommodate the new expectations (assimilation effect), since they still feel they made the right decision initially by visiting the site

(behavior). This occurs since users are accepting and assimilating of the outcome. This only occurs with minor disappointments or changes in expectations. If the users are extremely disappointed for waiting a long time to access the site, a negative attitude forms, and it is likely they overstate this negative change in attitude (contrast effect). Therefore, behavior (visiting the site) results in a change in attitude (negatively, if site visitors are extremely annoyed).

Third, Krugman's theory (1965) of passive learning sheds light on how behavior can affect attitude (Assael 1998). Krugman (1965) realizes that television is a low-involvement, passive medium of learning and advertising since individuals do not actively participate in the communication process. TV viewers have high brand recall but change little in terms of brand attitude. In a low-involvement situation, changes in attitudes may not result in modifications to behavior (Assael 1998). This is the case with low-involvement products, or items that require little search and decision making on part of the consumer, such as toilet paper. Most TV viewers may actually rate their purchases (behavior) favorably after postpurchase, resulting in more favorable opinions (attitudes) towards the purchase decision or brand.

Fourth, Bem's (1967, 1972) self-perception theory can be used to explain the reverse relationship of behavior on attitude. It is viewed as an alternative to cognitive dissonance theory. One does not have to experience dissonance to have an attitude change. Instead, individuals have knowledge of their emotions and internal states and reach a certain attitude based on their own overt behavior and the situations in which these behaviors take place just as an outside observer or another person would. In essence, individuals develop their own attitude by observing themselves act in various circumstances. This is especially the case when internal cues are weak or ambiguous that the individual is like an outside observer, relying on external signals to infer an internal state.

Furthermore in terms of the study's reverse indirect relationship to attitude and behavior, one minor difference between TAM and the present study is context or application. TAM is designed (initially) to apply at the workplace or at an organizational

level (Davis 1989; Davis et al. 1989), while the present study applies at a more individual level to users shopping at home (or possibly at work).

Limitations of the Study

The limitations of the study are related to the following aspects: laboratory or experimental setting, web site/product category, the subject sample, unidimensionality of one of the constructs, and addition of causal paths.

An experiment conducted in a laboratory or experimental setting lacks real world realism since the environment is artificial (Benbasat 1989). However, such conditions provide for tighter control and greater objectivity and hence increase internal validity (Benbasat 1989). Also, a web site environment still involves users sitting in front of a computer, which mimics what users do anyway when they access the web via a computer at home or work. Hence, the impact of a laboratory setting will most likely not deteriorate the eshopping experience of users and their interaction with the system. In addition, as a check for manipulation validity, correlations between the consequences of eshopping in the model and their hypothetical counterparts were high for site attitude. Hence, the subjects may have the same attitude towards the site regardless whether they were shopping in an experimental versus real setting.

In the study, the web site/product category introduces some limitations. There is only one web site (landsend.com) and only one product category (retail clothing). Landsend.com and its product category selected for the study may or may not meet all user requirements of what they expect in a web site. Some users may prefer a variety of merchandise and product categories (product breadth) in a site. The lack of variety in site selection and product breadth may adversely influence the eshopping experience of users and may have potentially affected the results of the study. However, since there is one site and it sells one main product category (apparel), this homogeneity may affect external (ecological) validity and hence generalizability of the results.

Characteristics of the sample pose further limitations. The users share common demographics and educational backgrounds. This may impact the external (population)

validity and generalizability of the study. However, college students are representative of many young eshoppers and web users in the real world. Also, despite the fact that homogeneity of the sample may affect external (population) validity, it also increases statistical power (Sawyer and Ball 1981) and in turn statistical conclusion validity (Cook and Campbell 1979). In addition, homogenous samples and laboratory environments (such as those using student samples) may produce better tests of theory in comparison with heterogeneous samples and settings (Calder et al. 1981).

The unidimensionality of one of the constructs, eshopping experience, poses somewhat of a limitation on the results of the study. Schmitt (1999) reports eshopping experience as a multidimensional construct with three, separate dimensions of sensory, affective, and cognitive eshopping experiences. However, second-order confirmatory factor analysis revealed that eshopping experience was actually a unidimensional first-order factor and not a multidimensional one with three separate elements, based on the present study's analysis of the Schmitt (1999) eshopping experience scale. It is a concern that out of the nine items in Schmitt's (1999) scale, only two items were usable in the present study. This leads to questioning the instrument's applicability in online experience settings. The multidimensionality of the construct would have facilitated a richer analysis of the separate components of eshopping experience and their direct effect on flow and indirect effect on the consequences of eshopping, as well the investigation of the impact of eshopping behavior and interactivity level on each of the eshopping experience dimensions. However, it is still useful to examine the overall or composite effect of eshopping experience in aggregate. This relationship still yields significant and valuable effects in the study. Using other instruments is a possible, future alternative to overcome this shortcoming.

The addition of three causal paths to arrive at the final model of the study poses another limitation. These paths were from cognitive enjoyment to future purchase intentions, and from interactivity level to both cognitive enjoyment and control. Even though the paths were empirically and theoretically plausible, they were not initially considered in the initial theoretical model. The concern regarding these paths is if these

paths only hold for the study's sample, and therefore cannot be generalized or applied to other settings, affecting external validity.

Contributions of the Study

The study provides several contributions to theory and practice in ecommerce and online consumer behavior fields.

Theoretical Implications for Research

The present study provided several contributions to research. First, the study attempted to add to the small base of existing studies that examine eshopping experience and flow theory in online environments in an ecommerce setting (Novak et al. 2003; Skadberg and Kimmel 2004). This contributed to the online consumer behavior and human-computer interaction literature by utilizing flow theory and investigating the mediating effects of eshopping experience and flow experience on the consequences of eshopping. Information systems scholars can look at eshopping behavior and interactivity level and benefit from the underlying relationships between these two variables, as well as eshopping experience, flow experience, and consequences of eshopping. These relationships can link the research findings to create new avenues for future research in web site design. A section below is dedicated to recommendations for future research.

Second, the present study's model posited the indirect effect of eshopping behavior on site attitude, instead of the traditional effect of attitude on behavior based on the theory of reasoned action and technology acceptance model. Implications for this reverse relationship based on cognitive dissonance theory, social judgment theory, and theory of passive learning were used to explain this indirect, reverse relationship (Assael 1998), as well as self-perception theory.

Third, the current investigation complemented the business-to-consumer ecommerce research by defining one of the constructs, an exogenous variable in the model, in more complex and comprehensive ways. Eshopping behavior was categorized along a ternary classification instead of the traditional binary one in the literature. With

the inclusion of mixed behavior, the three-level classification portrayed a more realistic representation of the complex consumer behavior over the simpler, polarized, and dichotomous grouping of experiential versus utilitarian behavior.

Fourth, the present study provided a research methodology contribution through the development of an future purchase intentions scale, a three-item scale measuring the likelihood that a user will purchase a product online while shopping.

Contributions to Practice

Regarding practical significance of the study, the findings should help inform web site design, facilitating the creation of sites which are more responsive to users by providing interactive features and understanding eshopping behaviors users exhibit.

By outlining the different factors that affect interface design over the Internet, such as eshopping behavior and interactivity level, developers will have potential guidelines to follow as they design and create applications. Web site designers and managers need to consider integrating these two factors to make eshopping experiences more enjoyable. In turn, this will potentially increase purchase intentions, traffic, and repeat visits on the site (Koufaris 2002), resulting in positive site attitudes and more frequent or longer visits, known as site *stickiness*. Consequences of eshopping (future purchase intentions and site attitude) affect online retailers' profits and hence are important to ecommerce companies and site developers. Since interactively level was found to be significant in terms of eshopping experience, site developers also need to underscore rich content for the interface for experiential users, and they should create very accessible and more user friendly interfaces for product information for utilitarian eshoppers (Wolfinbarger and Gilly 2001).

Furthermore, flow allows for greater user learning (Skadberg and Kimmel 2004), as well as eshopping experience. When an interface takes into account the effects of eshopping behavior and interactivity level, the user interface would be more user-friendly and easier to learn for users, who in the end are the ultimate consumers and beneficiaries of research, such as the findings from the current investigation.

Recommendations for Future Research

A suitable topic for future research is the investigation of a multitude of other product categories and services. The present study examined products and not services. Users may be interested in health insurance or financial services online. There are two types of products: low-involvement and high-involvement. Low-involvement products usually require less research and decision-making, as they tend to be inexpensive, such as napkins. On the other hand, high-involvement products require more research and decision-making, as they are usually more expensive, such as cars, homes, etc. It would be informative to replicate the research model of the study with services or high-involvement products and compare the results of each to the findings of the current study.

Another future research endeavor can investigate the causal paths that were added as result of arriving at the final model of the study. The propositions resulting from these paths can serve as hypotheses for future research. The three paths were empirically and theoretically plausible and presented interesting findings regarding interactivity level, flow (control and cognitive enjoyment), and future purchase intentions. These three relationships may be suitable for a future study to investigate these effects in depth and test if the results of the present study can be replicated. Replicating the results and arriving at the same findings regarding the new causal paths would bolster the reliability of the study and further support the justification of adding the causal links in the first place.

A recommendation for future research is to examine other dimensions of eshopping experience and consequences of eshopping. During the course of data analysis of Schmitt's (1999) scale, second-order factor analysis indicates eshopping experience is a unidimensional first-order factor. It would be very pertinent to examine the three eshopping dimensions separately: sensory, affective, and cognitive. Relational eshopping experience may also be considered in studies involving networked environments. A new instrument may be necessary to guarantee that the four dimensions are treated as separate constructs. Notable consequences of eshopping include site

recommendation to others, site revisits, attitude towards the vendor, and unplanned purchases. The exploration and study of these additional variables will shed worthwhile contributions on eshopping experience.

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APPENDIX A

LABORATORY PROCEDURES

This appendix includes the following: consent form, steps for the session, questionnaire and eshopping task instructions. Each subject was given a session packet containing all the aforementioned items. Once the subjects completed the required eshopping task, they completed and handed in their session packet.

During a typical session, subjects received this session task packet consisting of a consent form and instructions. Once they had signed the consent form, the instructions directed them to the online questionnaire where they filled out the personal shopping value scale (Babin et al. 1994) to determine if their eshopping behavior was experiential, utilitarian, or mixed. They were then directed to a randomly assigned treatment web site (low or high interactivity level) and asked to navigate the web site and carry out the eshopping task. Finally, they filled out a follow-up questionnaire about their eshopping experience. Camtasia Recorder (techsmith.com) generated an avi file (Windows video file format), which recorded all movements on the screen, such as mouse clicks. Each session lasted for approximately one hour.

Consent Form

Interactive Eshopping Experience: An Empirical Investigation

I have been asked to participate in a research study that examines eshopping experience. I was selected to be a possible participant because I signed up voluntarily on a sign-up sheet that was passed around in my INFO 209 (Mr. John Norton's) class. A total of 200 undergraduate classmates have been asked to participate.

The purpose of this study is to examine the effects of eshopping behavior and interactive features in a web site on eshopping experience. This study is part of the principal investigator's (Mr. Ahmed Y. Mahfouz') Ph.D. dissertation requirements. If I agree to be in this study, I will be asked to navigate a commercial retail clothing web site and search for one item of clothing. I will then fill out a questionnaire regarding my eshopping and interaction with the web site. I will neither be videotaped nor audio taped. However, a computer program will capture all my mouse clicks to make sure I am following the experimental task steps. This study will take only one session with one hour duration. The risks associated with this study are minimal, and it is very unlikely any harm or discomfort will happen to me.

The benefits of participation for me are 15 points of extra credit added to my final grade out of a possible 750 points total for the entire course. I will receive no monetary compensation for this study. If I do not follow the experimental task instructions and consequently be asked to leave, or if I do not participate in or decide to withdraw from the study, I will then be able to carry out an equivalent homework task for extra credit that takes the same time and effort and awards the same 15 points of extra credit. The alternative homework will entail I do a one page write-up that requires searching the Internet to locate an article in a trade journal in the information systems field that discusses a new emerging technology.

This study is confidential. This consent form and my data will be kept in a safe place. My data will be coded with an ID number, and my name will be removed right after the coding process is done. My name (on this consent form) and data will be stored separately. Hence, the records of this study will be kept private. No identifiers linking me to the study will be included in any sort of report that might be published. Research records will be stored securely and only Mr. Mahfouz and his advisors Dr. M. Scott Poole and Dr. Joobin Choobineh will have access to the records. Their contact information is listed next.

My decision whether or not to participate will not affect my current or future relations with Texas A&M University. If I decide to participate, I am free to refuse to answer any of the questions that may make me uncomfortable. I can withdraw at any time with out my relations with the university, job, benefits, etc., being affected. I can contact Mr. Mahfouz at 979-764-6936 (amahfouz@tamu.edu), Dr. Scott Poole at 979-845-9541 (mspoole@tamu.edu), and Dr. Choobineh at 979-845-4048 (jchoobineh@cgsb.tamu.edu) with any questions about this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Research Compliance, Office of Vice President for Research at (979) 458-4067 (mwbuckley@tamu.edu).

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. By signing below, I am indicating my willingness to participate in this study. I have been given a copy of this consent form.

Name (print): _____ Email: _____

Signature: _____ Date: _____

Signature of Investigator: _____ Date: _____

Ahmed Y. Mahfouz

Ph.D. Candidate, Information and Operations Management Department

Steps for the Session

The steps for the session include start-up, task execution and site navigation, and conclusion. The time for the entire session is one hour.

Start-up (15 minutes)

1. Give out the session task instructions.
2. Give out the CD-RW and pens, etc.
3. Ask subjects to read and sign the consent forms.
4. Log in with a username and password.
5. Instruct subjects to fill out the personal shopping value scale to determine their eshopping behavior (experiential versus utilitarian).
6. Answer questions if necessary.

Task Execution and Site Navigation (30 minutes)

7. Ask subjects to complete the eshopping task requirements.
8. Answer questions if necessary.
9. Instruct subjects to navigate the web site and carry out the eshopping task.

Conclusion (15 minutes)

10. Ask participants to fill out the follow-up questionnaire.
11. Ask subjects to burn the file that captured their mouse clicks on a CD-RW. The filename should match the number they are assigned on the first page of session task instructions.
12. Gather session task instructions, CD-RWs, and or any other items given out.
13. Explain the time frame when the extra credit will be posted.
14. Ask the subjects not to speak to others about the experiment or what it entails so that new subjects would not have prior knowledge of the study.
15. Thank and release the subjects.
16. The experiment concludes.

Instrument and Eshopping Task Instructions Given to Subjects

Below is a copy of the actual instrument with randomized questions and eshopping task instructions, given to subjects, for both the low and high interactivity level treatments.

Low Interactivity Level Treatment

SUBJECT # _____

INSTRUCTIONS FOR THE SESSION

1. Go to any computer (the black Dell ones) in the first two rows of the room only.
2. Please turn off your cell phone.
3. **Please read this entire page first before proceeding to carry out its steps.**
4. After reading this entire page, you may begin carrying out the next step.
5. When the appropriate time comes, you will be provided with a login username and password.
6. When the right time comes, you will be asked to insert your CD-RW.
7. You will find a single page called ***Consent Form***.
8. Please read, sign, and take it with you when you leave.
9. Read and sign the following page (duplicate copy of the Consent Form).
10. Please print your name legibly on the bottom of the form, as this form will be used to record your extra credit.
11. Log in with
    a. username:
    b. password:
12. Launch Internet Explorer.
    a. There is a short cut on the desktop (on the left).
    b. Go the web site the lab attendant gives you to fill out the questionnaire.

13. You should have received this session instruction sheet, a CD-RW, and a pen.
14. **It is very important that you follow all the directions please**.
15. Jot down the following information:
    a. Computer number _____ (if available)
    (The number is written on the monitor and has the form like UGL-10.)
    b. CD-RW number: _____.

16. **Fill out the following questionnaire**.

Circle your appropriate response to the following statements and questions.

1. I am a _____.
   a) Male b) Female

2. While shopping online, I find just the item(s) I am looking for.

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

3. Have you ever visited landsend.com before this session?
   a) Yes b) No

4. I enjoy being immersed in exciting new products.

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

5. Online shopping is not a nice time out.

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

6. I continue to shop online, not because I have to, but because I want to.

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

7. I am _____ years old.
   a) 18 & under b) 19-21 c) 22-24 d) 25-27 e) 28+

8. Compared to other things I could be doing, the time spent shopping online is truly enjoyable.

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

9. While shopping online, I feel a sense of adventure.

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

10. I am currently working on my _____ degree.
    a) High school b) Associate c) Bachelor's d) Master's e) Ph.D.

11. I enjoy shopping online for its sake, not just for the items I may have purchased.

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

12. Shopping online is truly a joy.

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

13. I am disappointed because I have to go to another store(s) to complete my online shopping.

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

14. I accomplish just what I want to while shopping online.

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

15. I use the Internet mainly for _____.
    a) School b) Shopping c) Games d) News e) Other

16. Online shopping truly feels like an escape.

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

17. While shopping online, I am able to forget my problems.

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

18. The time I spend online weekly is _____ hours.
    a) 9 & under b) 10-19 c) 20-29 d) 30-39 e) 40+

19. I have a good time because I am able to act on the "spur-of-the-moment."

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

20. During shopping online, I feel the excitement of the hunt.

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

21. I cannot buy what I really need.

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

22. Insert the CD-RW in the top most drive/bay of your computer.
    a. Wait a few (10 or so) seconds.
    b. If any windows open after inserting the CD-RW (e.g. *directCD format utility*), simply close this/those window(s).
23. Launch Camtasia Recorder.
    a. Go to Start button | Programs | Camtasia Studio 2 | Applications | Camtasia Recorder
    b. Click on the Finish button.
    c. Go to the Capture menu | Input | Screen *(select Screen, if not already selected)*
    d. Go to the Capture menu | Output | File *(select File, if not already selected)*
    e. Go to the Tools menu | Capture tab: Performance Options
        i. Make sure "Disable display acceleration during capture" is checked. If not, check it, click Okay, and then click Okay.
    f. **Press F9 to start recording**. The screen will go blank for a moment.
24. In Internet Explorer,
    a. Go to the File menu | New | Window
    b. http://www.landsend.com should come on automatically.

25. Find one item of clothing that is of interest to you.
26. You may **not** use any of the following features: *my model (My Virtual Model), Lands' End Custom Clothing, and Personal Shopper (My Personal Shopper),* or any other feature other than product images (pictures of clothes) and word descriptions of products. You have a maximum of 30 minutes to search for an item of clothing that is of interest to you.
    a. Keep in mind that all your mouse clicks are captured by Camtasia. This is important to ensure that you follow all the steps and consequently to ensure the validity of the results of the experiment.
27. Once you have found the item of clothing that is of interest to you, stop navigating the web site.
28. **Press F10 to stop recording**. The screen will be blank for a moment.
    a. When a "Save Movie File As" window appears, select the following:
        i. *Save in* (at the top): *Volume_x* (E:) (x will automatically show the number of your CD-RW)
        ii. *File name*:

1. The filename should match the number you are assigned on the right hand corner of the first page of this session task packet, such as 2, so only type that number only.

b. Click on the Save button. The Camtasia window may go blank (with a white background) for a minute or so. Proceed with the next step in the meantime.

29. Please fill out the remainder of your questionnaire (the following last few pages).

Circle your appropriate response to the following statements and questions.

1. When using the site, I was totally absorbed in what I was doing.

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

2. The site tries to put me in a certain mood.

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

3. Using the site excited my curiosity.

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

4. The site tries to engage my senses.

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

5. Using the site bored me.

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

6. The site does not try to appeal to feelings.

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

7. When using the web site, I felt in control.

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

8. I may buy merchandise from this site in the future.

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

9. When using the site, I was aware of distractions.

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

10. The site lacks sensory appeal for me.

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

11. I felt that I had no control over my interaction with the site.

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

12. Using the site aroused my imagination.

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

13. The site tries to intrigue me.

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

14. When using the site, I thought about other things.

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

15. The site does not try to appeal to my creative thinking.

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

16. Using the site was intrinsically interesting.

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

17. I probably intend to buy an item from this site in the future.

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

18. The site was fun for me to use.

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

19. The site makes me respond in an emotional manner.

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

20. The site stimulates my curiosity.

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

21. In the future, I will likely plan to purchase from this site the item I searched for.

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

22. Interacting with the site made me curious.

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

23. The site is perceptually interesting.

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

24. The site allowed me to control the computer interaction.

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

25. This web site enables me to order products that are tailor-made for me.

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

26. This site is interesting.

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

27. If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site.

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

28. If I were not in a research study but was actually shopping for an item online, I would have a positive attitude towards this site.

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

29. If I were not in a research study but was actually shopping for an item online, I would recommend this site to a friend.

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

30. I like this site.

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

31. I feel that this is a very engaging web site.

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

32. This web site makes purchase recommendations that match my needs.

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

33. If I were not in a research study but was actually shopping for an item online, I may visit this site again.

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

34. I believe that this web site is customized to my needs.

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

35. This site is enjoyable.

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

36. Please rate the site on the following criteria: provides significant interaction.

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

37. This web site makes me feel that I am a unique customer.

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

38. Please rate the site on the following criteria: offers customization.

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

39. Eject the CD-RW and place it in the little plastic bag you were given.
    a. Close the CD-RW drive door.
40. Close ALL open windows or programs (Internet Explorer, Camtasia, etc.).
41. **Logoff.**

42. Please do not speak to others about the experiment or what it entails so that new subjects would not have prior knowledge of the study. This includes not mentioning what web site you visited. Otherwise, the integrity of the whole project would be comprised. I thank and trust you based on the Honor Code.
43. Your instructor will announce when the extra credit has been recorded so please do not ask him when the extra credit is added to your grade till you hear his announcement on the class Announcements page. He will not get the scores from me till at least several days after the conclusion of all the sessions.
44. Before leave the lab, turn in this instruction session packet, the CD-RW, and the pen you were given.
45. Thank you for your participation.

High Interactivity Level Treatment

SUBJECT # _____

INSTRUCTIONS FOR THE SESSION

1. Go to any computer (the black Dell ones) in the first two rows of the room only.
2. Please turn off your cell phone.
3. **Please read this entire page first before proceeding to carry out its steps.**
4. After reading this entire page, you may begin carrying out the next step.
5. When the appropriate time comes, you will be provided with a login username and password.
6. When the right time comes, you will be asked to insert your CD-RW.
7. You will find a single page called ***Consent Form***.
8. Please read, sign, and take it with you when you leave.
9. Read and sign the following page (duplicate copy of the Consent Form).
10. Please print your name legibly on the bottom of the form, as this form will be used to record your extra credit.
11. Log in with
    a. username:
    b. password:
12. Launch Internet Explorer.
    a. There is a short cut on the desktop (on the left).
    b. Go the web site the lab attendant gives you to fill out the questionnaire.

13. You should have received this session instruction sheet, a CD-RW, and a pen.
14. **It is very important that you follow all the directions please**.
15. Jot down the following information:
    a. Computer number _____ (if available)
       (The number is written on the monitor and has the form like UGL-10.)
    b. CD-RW number: _____.

16. **Fill out the following questionnaire**.

Circle your appropriate response to the following statements and questions.

1. I am a _____.
   a) Male b) Female

2. While shopping online, I find just the item(s) I am looking for.

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

3. Have you ever visited landsend.com before this session?
   a) Yes b) No

4. I enjoy being immersed in exciting new products.

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

5. Online shopping is not a nice time out.

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

6. I continue to shop online, not because I have to, but because I want to.

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

7. I am _____ years old.
   a) 18 & under b) 19-21 c) 22-24 d) 25-27 e) 28+

8. Compared to other things I could be doing, the time spent shopping online is truly enjoyable.

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

9. While shopping online, I feel a sense of adventure.

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

10. I am currently working on my _____ degree.
    a) High school b) Associate c) Bachelor's d) Master's e) Ph.D.

11. I enjoy shopping online for its sake, not just for the items I may have purchased.

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

12. Shopping online is truly a joy.

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

13. I am disappointed because I have to go to another store(s) to complete my online shopping.

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

14. I accomplish just what I want to while shopping online.

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

15. I use the Internet mainly for _____.
    a) School b) Shopping c) Games d) News e) Other

16. Online shopping truly feels like an escape.

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

17. While shopping online, I am able to forget my problems.

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

18. The time I spend online weekly is _____ hours.
    a) 9 & under b) 10-19 c) 20-29 d) 30-39 e) 40+

19. I have a good time because I am able to act on the "spur-of-the-moment."

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

20. During shopping online, I feel the excitement of the hunt.

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

21. I cannot buy what I really need.

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

22. Insert the CD-RW in the top most drive/bay of your computer.
    a. Wait a few (10 or so) seconds.
    b. If any windows open after inserting the CD-RW (e.g. *directCD format utility*), simply close this/those window(s).
23. Launch Camtasia Recorder.
    a. Go to Start button | Programs | Camtasia Studio 2 | Applications | Camtasia Recorder
    b. Click on the Finish button.
    c. Go to the Capture menu | Input | Screen *(select Screen, if not already selected)*
    d. Go to the Capture menu | Output | File *(select File, if not already selected)*
    e. Go to the Tools menu | Capture tab: Performance Options
        iii. Make sure "Disable display acceleration during capture" is checked. If not, check it, click Okay, and then click Okay.
    f. **Press F9 to start recording**. The screen will go blank for a moment.
24. In Internet Explorer,
    a. Go to the File menu | New | Window
    b. http://www.landsend.com should come on automatically.

25. You will be familiarizing yourself with the site, its product offerings and features. Find one item of clothing that is of interest to you. You will be using THREE features in this process (as outlined in the next step).
    a. Keep in mind that all your mouse clicks are captured by Camtasia. This is important to ensure that you follow all the steps and consequently to ensure the validity of the results of the experiment.
26. Include ALL of the following features in your shopping: *my model (My Virtual Model), Lands' End Custom Clothing*, and *My Personal Shopper (Personal Shopper)*. You will have approximately a maximum of **10 minutes** to use each of the three features (or 30 minutes total). Please, do not use any other feature. The *Site Map* is the easiest way to access any feature:
    a. On the left hand side (the blue frame), scroll down and go to the last link *Site Map* and click on it.
    b. Scroll down to the heading *Shopping Tools* and click on any of these three aforementioned features that you many find.

c. *Also, below are specific instructions to find these features if you still need help.*
   i. **my model** (10 minutes)
      1. Go back to landsend.com's homepage (by clicking on the company logo in the top left-hand corner).
      2. Go to the top left hand portion of the screen. Click on *my model*.
         1. Follow the instructions on the screen to create your own virtual model.
         2. If you like to save your profile, it may take a minute or so.
   ii. **Lands' End Custom Clothing** (10 minutes)
      1. Go back to landsend.com's homepage (by clicking on the company logo in the top left-hand corner).
      2. Click on *Special Collections* at the top portion of the screen and slightly to the right.
      3. Look for and click on the *Men* or *Women* link (about center page), whichever is appropriate for you.
      4. Click on any product image of a clothing item you like.
         1. Follow the steps on the screen to custom-make an item for yourself.
         2. When done, do *not* click on the *Confirm* button at the bottom.
         3. Proceed to the next step.
   iii. **my personal shopper** (10 minutes)
      1. Go back to landsend.com's homepage (by clicking on the company logo in the top left-hand corner).
      2. On the left hand side (the blue frame), scroll down and go to the last link *Site Map* and click on it.
      3. Scroll down to the heading *Shopping Tools* and click on *Personal Shopper*.
      4. Follow the instructions on the screen.

27. Once you have used all of the three features listed above to find one item of clothing that is of interest to you, stop navigating the web site.
28. **Press F10 to stop recording**. The screen will be blank for a moment.
    a. When a "Save Movie File As" window appears, select the following:
       i. *Save in* (at the top): *Volume_x* (E:) (x will automatically show the number of your CD-RW)
       ii. *File name*:
          1. The filename should match the number you are assigned on the right hand corner of the first page of this session task packet, such as 2, so only type that number only.
    b. Click on the Save button. The Camtasia window may go blank (with a white background) for a minute or so. Proceed with the next step in the meantime.

29. Please fill out the remainder of your questionnaire (the following last few pages).

Circle your appropriate response to the following statements and questions.

1. When using the site, I was totally absorbed in what I was doing.

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

2. The site tries to put me in a certain mood.

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

3. Using the site excited my curiosity.

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

4. The site tries to engage my senses.

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

5. Using the site bored me.

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

6. The site does not try to appeal to feelings.

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

7. When using the web site, I felt in control.

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

8. I may buy merchandise from this site in the future.

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

9. When using the site, I was aware of distractions.

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

10. The site lacks sensory appeal for me.

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

11. I felt that I had no control over my interaction with the site.

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

12. Using the site aroused my imagination.

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

13. The site tries to intrigue me.

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

14. When using the site, I thought about other things.

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

15. The site does not try to appeal to my creative thinking.

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

16. Using the site was intrinsically interesting.

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

17. I probably intend to buy an item from this site in the future.

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

18. The site was fun for me to use.

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

19. The site makes me respond in an emotional manner.

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

20. The site stimulates my curiosity.

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

21. In the future, I will likely plan to purchase from this site the item I searched for.

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

22. Interacting with the site made me curious.

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

23. The site is perceptually interesting.

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

24. The site allowed me to control the computer interaction.

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

25. This web site enables me to order products that are tailor-made for me.

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

26. This site is interesting.

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

27. If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site.

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

28. If I were not in a research study but was actually shopping for an item online, I would have a positive attitude towards this site.

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

29. If I were not in a research study but was actually shopping for an item online, I would recommend this site to a friend.

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

30. I like this site.

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

31. I feel that this is a very engaging web site.

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

32. This web site makes purchase recommendations that match my needs.

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

33. If I were not in a research study but was actually shopping for an item online, I may visit this site again.

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

34. I believe that this web site is customized to my needs.

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

35. This site is enjoyable.

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

36. Please rate the site on the following criteria: provides significant interaction.

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

37. This web site makes me feel that I am a unique customer.

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

38. Please rate the site on the following criteria: offers customization.

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

39. Eject the CD-RW and place it in the little plastic bag you were given.
    a. Close the CD-RW drive door.
40. Close ALL open windows or programs (Internet Explorer, Camtasia, etc.).
41. **Logoff.**

42. Please do not speak to others about the experiment or what it entails so that new subjects would not have prior knowledge of the study. This includes not mentioning what web site you visited. Otherwise, the integrity of the whole project would be comprised. I thank and trust you based on the Honor Code.
43. Your instructor will announce when the extra credit has been recorded so please do not ask him when the extra credit is added to your grade till you hear his announcement on the class

Announcements page. He will not get the scores from me till at least several days after the conclusion of all the sessions.

44. Before leave the lab, turn in this instruction session packet, the CD-RW, and the pen you were given.
45. Thank you for your participation.

APPENDIX B

INSTRUMENT USED IN THE PRESENT STUDY

This appendix contains the instrument used in the present study with its various scales. A copy of the actual instrument with randomized questions and eshopping task instructions, given to subjects, appears in Appendix A on page 146.

An asterisk (*) indicates an item is reverse-coded, as stated in the original scale. To reverse-code an item, add one to the highest value in the scale and subtract two from the result. For example, if the subject selects 2 on a scale of 7, the reverse-coded response is 6, or (7+1) - 2.

Subject Demographics Scale

1. DemoGen. I am a _____.
   a) Male b)Female
2. DemoAge. I am _____ years old.
   a) 18 & under b) 19-21 c) 22-24 d) 25-27 e) 28+
3. DemoEduc. I am currently working on my _____ degree.
   a) High school b) Associate c) Bachelor's d) Master's e) Ph.D.
4. DemoIUse. I use the Internet mainly for _____.
   a) School b) Shopping c) Games d) News e) Other
5. DemoITim. The time I spend online weekly is _____ hours.
   a) 9 & under b) 10-19 c) 20-29 d) 30-39 e) 40+
6. DemoVist. Have you ever visited landsend.com before this session?
   a) Yes b) No

For the following questions, each item has a seven-point Likert scale:

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

Personal Shopping Value Scales

(Present tense is used instead of past tense. Furthermore, since the present study deals with online shopping, the words "shopping online" take place of the terms "shopping trips" in the original scale. Also, the word "online" is added to the word "shopping.")

Experiential (Hedonic)

Cronbach's alpha = .93 (Babin et al. 1994)

7. Exp1. Shopping online is truly a joy.

8. Exp2. I continue to shop online, not because I have to, but because I want to.
9. Exp3. Online shopping truly feels like an escape.
10. Exp4. Compared to other things I could be doing, the time spent shopping online is truly enjoyable.
11. Exp5. I enjoy being immersed in exciting new products
12. Exp6. I enjoy shopping online for its sake, not just for the items I may have purchased.
13. Exp7. I have a good time because I am able to act on the "spur-of-the-moment."
14. Exp8. During shopping online, I feel the excitement of the hunt.
15. Exp9. While shopping online, I am able to forget my problems.
16. Exp10. While shopping online, I feel a sense of adventure.
17. Exp11. Online shopping is not a nice time out.*

Utilitarian

Cronbach's alpha = .80 (Babin et al. 1994)

18. Util1. I accomplish just what I want to while shopping online.
19. Util2. I cannot buy what I really need.*
20. Util3. While shopping online, I find just the item(s) I am looking for.
21. Util4. I am disappointed because I have to go to another store(s) to complete my online shopping.*

Eshopping Experience Scales

Cronbach's alpha = .85 (Schmitt 1999)

Sensory

22. EShpExp1. The site tries to engage my senses.
23. EShpExp2. The site is perceptually interesting.
24. EShpExp3. The site lacks sensory appeal for me.*

Affective

25. EShpExp4. The site tries to put me in a certain mood.
26. EShpExp5. The site makes me respond in an emotional manner.
27. EShpExp6. The site does not try to appeal to feelings.*

Cognitive

28. EShpExp7. The site tries to intrigue me.
29. EShpExp8. The site stimulates my curiosity.
30. EShpExp9. The site does not try to appeal to my creative thinking.*

Flow Experience Scales

Cronbach's alpha = .82 (Webster et al. 1993)

Control

31. FlwCtrl1. When using the web site, I felt in control.
32. FlwCtrl2. I felt that I had no control over my interaction with the site.*
33. FlwCtrl3. The site allowed me to control the computer interaction.

Attention Focus

34. FlwAttn1. When using the site, I thought about other things.*
35. FlwAttn2. When using the site, I was aware of distractions.*
36. FlwAttn3. When using the site, I was totally absorbed in what I was doing.

Cognitive Enjoyment

37. FlwCEnj1. Using the site excited my curiosity.
38. FlwCEnj2. Interacting with the site made me curious.
39. FlwCEnj3. Using the site aroused my imagination.
40. FlwCEnj4. Using the site bored me.*
41. FlwCEnj5. Using the site was intrinsically interesting.
42. FlwCEnj6. The site was fun for me to use.

Consequences of Eshopping Scales

The future purchase intentions scale is developed during the course of the present study.

Future Purchase Intentions

Cronbach's alpha = .91

43. IntBuy1. I probably intend to buy an item from this site in the future.
44. IntBuy2. I may buy merchandise from this site in the future.
45. IntBuy3. In the future, I will likely plan to purchase from this site the item I searched for.

Site Attitude

Cronbach's alpha = .92 (Teo et al. 2003)

46. Attitud1. This site is interesting.
47. Attitud2. This site is enjoyable.
48. Attitud3. I like this site.

Manipulation Checks Scales

There are manipulation checks for interactivity level and the consequences of eshopping.

Interactivity Scale

Cronbach's alpha = .83 (Palmer 2002)

49. InterP1. Please rate the site on the following criteria: offers customization.
50. InterP2. Please rate the site on the following criteria: provides significant interaction.

Cronbach's alpha = .80 (Srinivasan et al. 2002)

51. InterS1. This web site makes purchase recommendations that match my needs.
52. InterS2. This web site enables me to order products that are tailor-made for me.
53. InterS3. This web site makes me feel that I am a unique customer.
54. InterS4. I believe that this web site is customized to my needs.
55. InterS5. I feel that this is a very engaging web site.

Checks for the Consequences of Eshopping

56. Questn1. If I were not in a research study but was actually shopping for an item online, I would probably intend to buy an item from the site.
57. Questn2. If I were not in a research study but was actually shopping for an item online, I may visit this site again.
58. Questn3. If I were not in a research study but was actually shopping for an item online, I would recommend this site to a friend.
59. Questn4. If I were not in a research study but was actually shopping for an item online, I would have a positive attitude towards this site.

An asterisk (*) indicates an item is reverse-coded, as stated in the original scale.

APPENDIX C

SEM TESTS, INDICES, AND CATEGORICAL VARIABLES

Since the analysis of the study's model required the use of the chi-square goodness of fit test; chi-square difference test; and various indices of fit, parsimony, and both fit and parsimony, a brief discussion is introduced below. In addition, a discussion of the preprocessing of categorical exogenous variables concludes this section.

Chi-Square Goodness of Fit Test and Chi-Square Difference Test

The data analysis required the use of the chi-square goodness of fit test and chi-square difference test. The chi-square goodness of fit test is a statistic of a test of the null hypothesis (H_0) that a given model provides an acceptable fit of the data (Bentler and Bonett 1980; Hatcher 1994, p. 189). It is desirable to obtain a relatively small chi-square and a nonsignificant chi-square value with a large p value (to fail to reject the null hypothesis). However, in applied behavioral research, common practice supports a model with a relatively small chi-square value over a nonsignificant chi-square, which may be more difficult to obtain, given the model is acceptable otherwise by meeting other criteria, such as acceptable goodness of fit indices, etc. (Hatcher 1994, pp. 289-191; Jöreskog and Sörbom 1996a, p. 28). The chi-square statistic is sensitive to sample size and departures from multivariate normality, and it may result in rejection of an acceptable model of fit (Hatcher 1994, p. 415; Jöreskog and Sörbom 1996a, pp. 28-29). Hence, it should be used as a general index of fit.

The chi-square difference test is a test of the null hypothesis (H_0) that the parameters of two models of interest are equal (Bentler and Bonett 1980). For example, in comparing two competing models (a revised model 2 or Mr2 with revised model 1 or Mr1) after adding a new path to Mr1 to arrive at Mr2, a significant chi-square difference value indicates a significant improvement, and hence Mr2 provides a better fit over Mr1. (However, if a path is dropped from Mr1 to arrive at Mr2, the desired result is actually a non-significant chi-square difference value between the two models, which indicates that dropping a given path does not decrease the model fit). On the other hand, in comparing a theoretical model of interest to the measurement model, a nonsignificant chi-square difference value should be obtained (Hatcher 1994, p. 393). In other words, there is no significant difference in fit between the final theoretical and measurement model, which is the desired outcome.

Indices of Fit, Parsimony, and Both Fit and Parsimony

Path analysis with latent variables for the model required the use of various measures: indices of fit, parsimony, and both fit and parsimony for both the full model and structural portion of the model (Hatcher 1994). Given two models having a good fit, the better model is the most parsimonious or simpler, following the scientific parsimony principle of Occam's razor. Whenever, the term relative is attached to the beginning of an index, it means it pertains to the structural portion of the model (Hatcher 1994).

There were several indices of fit for the full model in the present study. One index is Jöreskog and Sörbom (1979) $\chi 2$/df ratio of the chi-square to its degrees of freedom, which

should be less than 3:1 for an acceptable fit (Chin and Todd 1995). Comparing the fit of the model to the population covariance matrix, another index of fit is Steiger and Lind (1980) root mean square error of approximation (RMSEA). Covariance is a measure of association between two variables, and the covariance between standardized variables is called their correlation, with values ranging from -1 to +1 (Kerlinger and Lee 2000, p .121). Taking into account the error of approximation in the population, RMSEA measures the discrepancy (as expressed per degree of freedom) in fit between the model of interest and the population covariance matrix if it were available (Browne and Cudeck 1993). RMSEA values of about .05 or less indicate a good fit, while values of about .08 or less indicate a reasonable fit (Browne and Cudeck 1993); values between .08 and .10 indicate mediocre fit, and those in excess of .10 show poor fit (Browne and Cudeck 1993; MacCallum et al. 1996). In addition, Bentler and Bonett's (1980) normed-fit index (NFI) and non-normed-fit index (NNFI), as well as Bentler's (1989) comparative fit index (CFI), are indices for fit for the full model. NFI, NNFI, and CFI values greater than .9 indicate an acceptable fit of the model to the data.

James et al.'s (1982) parsimony ratio (PR) is a measure of parsimony of the full model, while James et al.'s (1982) parsimonious normed-fit index (PNFI) is a measure that reflects both fit and parsimony of the full model. PR and PNFI values are used for relative comparisons of models of interest, with higher values being more desirable, for example, in excess of .6 (Netemeyer et al. 1990).

For the structural portion of the model, Mulaik et al.'s (1989) relative normed-fit index (RNFI) is a measure of fit; relative parsimony ratio (RPR) is an indicator of parsimony; and relative parsimonious-fit index (RPFI) is a measure of both fit and parsimony. Higher values of the indices are more desirable. Indices of fit, parsimony, and both fit and parsimony for both the full model and structural portion of the model are shown in Table 42 (adapted from Hatcher 1994).

Table 42. Indices of Fit, Parsimony, and Both Fit and Parsimony (Adapted from Hatcher 1994)

	Full Model								Structural Model		
Type of Index	χ^2	χ^2/df	RMSEA	NFI	NNFI	CFI	PR	PNFI	RNFI	RPR	RPFI
Fit											
Parsimony											
Fit and Parsimony											

Note: $\chi^2/df = \chi^2$/degrees of freedom; RMSEA = root mean square error of approximation; NFI = normed-fit index; NNFI = non-normed-fit index; CFI = comparative fit index; PR = parsimony ratio; PNFI = parsimonious normed-fit index; RNFI = relative normed-fit index; RPR = relative parsimony ratio; RPFI = relative parsimonious-fit index.

Preprocessing of Categorical Exogenous Variables

One of the necessary conditions for classical structural equation modeling is that the variables are continuous or based on an interval or ratio scales (Hatcher 1994). Since the two exogenous variables in the study's model were categorical, special handling of those variables was required. Furthermore, all the endogenous variables in the model were measured using Likert scales. All Likert scales are actually ordinal scales; and in the present study, they had seven levels (with anchors ranging from 1 = strongly disagree to 7 = strongly agree). Technically, these ordinal scales pose the same problem regarding continuous variables. However, categorical variables with four or more categories can be analyzed using continuous methods (Bentler and Chou 1987, p. 88), and hence the major concern in the present study was the handling of the exogenous variables. However, erring on the most conservative side, special handling of all variables (and not just the exogenous ones) was conducted in the present study. There are several recommended methods of handling categorical exogenous variables, as well as methods to manage interaction effects in structural equation modeling, as summarized in Table 43.

Table 43. Procedures for Categorical Exogenous Variables or Interactions

Issue/Recommended Procedure	References in the Literature
Categorical Exogenous Variables	
Preprocessing in a software package (e.g. PRELIS)	Byrne 1998; Jöreskog and Sörbom 1996a, 1996b
Dummy-coding of variables	Hatcher 1994; Tabachnick and Fidell 1996
Multiple group analysis	Tabachnick and Fidell 1996
Interaction Effects	
Multiple group analysis	Gefen et al. 2000; Jöreskog and Sörbom 1989
Creation of a new interaction variable	Bollen 1989; Chin et al. 1996

First, preprocessing in software packages, such as PRELIS (included with LISREL), creates the required polychoric (including tetrachoric for dichotomous variables) correlation matrices (Byrne 1998; Jöreskog and Sörbom 1996a, 1996b).

Second, even though endogenous variables must be continuous, exogenous variables may be categorical, if they are dummy-coded in packages, such as SAS, AMOS, etc. (Hatcher 1994, p. 148; Tabachnick and Fidell 1996, p. 764). Cohen et al. (2003, p. 304) and Neter et al. (1990, p. 465) illustrate how to dummy-code variables, especially variables with more than two classes (polychotomous), such as eshopping behavior which has three levels.

Third, categorical variables can be treated using multiple group analysis, where one model is tested for each different level of the variable (Tabachnick and Fidell 1996, p. 764). AMOS can run multiple group analysis easily, and Byrne (2001) shows examples for this type of analysis. However, multiple group analysis requires a large sample size (Tabachnick and Fidell 1996). Multiple group analysis can facilitate the analysis of interaction effects (Gefen et al. 2000, p. 38; Jöreskog and Sörbom 1989), which is advantageous since one of the assumptions of path

analysis is that the variables have linear and additive (not curvilinear or interactive) relationships (Hatcher 1994). Interaction effects can also be modeled by adding a term or variable for the interaction term that is a combination of the two or more variables (Bollen 1989, p. 128; Chin et al. 1996). Traditionally, if interaction or simple effects do exist in a model, then orthogonal contrasts (Cohen et al. 2003, p. 336) along with rank-ordering of these contrasts (in terms of effect) may also be run.

Given all the above alternative ways of handling categorical exogenous variables, the method used in study's analysis was preprocessing in PRELIS to create polychoric (including tetrachoric) correlations. Using an interaction variable, the interaction was also examined in MANOVA for a multivariate effect. Subsequently in the analysis, a multiple comparison procedure was used to assess how pairs of multiple groups are statistically different from each other. Specifically, Tukey's HSD test was appropriate to interpret for a multivariate technique, specifically MANOVA, given that two conditions are met in the following sequence (Hatcher and Stepanski 1994, pp. 286-287; Stevens 1996, pp. 196-198, 203): (1) the multivariate F statistic derived from Wilks' lambda is significant, which indicates an overall multivariate effect of a given predictor (independent) variable; and (2) the specific univariate F statistic for a given criterion (dependent) variable of interest (for which Tukey's HSD test will be interpreted) is significant.

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