A MODEL OF ONLINE IMPULSE BUYING:

AN EMPIRICAL STUDY

By

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Like any large undertaking, this research project was the culmination of the work of a large team of people and I would like to take the opportunity to thank them for their valuable help and support in the achievement of this milestone in my career.

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A MODEL OF ONLINE IMPULSE BUYING:

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Abstract

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Impulse buying is a phenomenon that has received considerable attention from marketing researchers and has been studied extensively in an offline setting. There is preliminary evidence that this behavior is rampant in an online setting. With the proliferation of electronic commerce, there is both a need and opportunity to examine impulse buying in an online setting. This paper proposes a theoretical model that explains this behavior in an electronic commerce setting.

A research study was administered to validate the model. The results of this study suggest that two conditions enhance online impulse purchase behavior. First, any negative cognitive reactions should be minimized by ensuring that the website is secure and easy to navigate. Second, the emotional reactions to the interface should be maximized by using an innovative and creative interface design. The results of this study not only benefit the electronic commerce literature and the general human-computer interaction (HCI) domain, but also make a significant to the reference disciplines which include consumer behavior and environmental psychology.

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CHAPTER 1

INTRODUCTION AND RESEARCH QUESTIONS

This chapter provides an introduction of the dissertation by broadly explaining the phenomenon under study – online impulse buying. In the first section, a general background of the topic is provided along with justification for the need of this research endeavor and two specific research questions. The following section covers the importance of this research both from a theoretical and practical standpoint. Finally, the general outline of the dissertation is presented.

1.1 Introduction

Impulse buying is a ubiquitous and unique aspect of consumers' lifestyle. Retailers realize the importance of this phenomenon, and through store layouts, product packaging, and in-store promotions, they have tried to get consumers to be impulsive in stores (Dholakia 2000). Over the years, impulse buying has also been made easier by innovations, such as credit cards, telemarketing, and home shopping networks (Rook 1987). Consequently, impulse buying accounts for a large volume of product sales every year (Hausman 2000). Because of its prevalence, researchers from different disciplines, such as consumer behavior and psychology, have shown interest in studying this behavior. A review of this body of knowledge indicates that impulse buying has been mainly studied in a traditional commerce setting.

In the last decade, rapid developments in information technology have substantially changed the landscape of consumer behavior. The availability of 24-hour retailing through the Internet has brought about an increase in online retailing and inevitably, an increase in impulse

buying. With the Internet, consumers' buying opportunities have expanded through an increased accessibility to products and services and the increased ease to make purchases. Moreover, this new mode of shopping often eliminates the constraints of time and space that are often experienced by shoppers in a traditional commerce context (Eroglu et al. 2001).

As a consequence, Internet shoppers can be more impulsive than traditional shoppers (Donthu and Garcia 1999). Indeed, there is preliminary evidence that indicates that impulse buying is rampant in an online context (Greenfield 1999; Li et al. 2000). The distinct characteristic of an electronic commerce (e-commerce) context, in contrast to a traditional commerce setting, is that information technology (IT) mediates the relationship between the online consumer and the online retailer. Based on the preliminary evidence that this behavior is prevalent in an online context, an opportunity exists to identify the characteristics of the web interface that influence impulse buying.

To date, few researchers have studied online impulse purchase behavior. For example, LaRose (2001) identified the features that influence unregulated buying behavior at popular websites, but provided no empirical evidence for his propositions. Similarly, Koufaris and colleagues (2001-2002) and Koufaris (2002) examined unplanned purchases on the Internet, but their results were not conclusive. More recently, Dutta and colleagues (2003) examined how implementation characteristics of online payment processes affect impulsive buying behavior, but their findings were limited because of a small sample size.

A common theme emerging from these studies is a call for future research to understand the online impulse purchase behavior. For instance, Koufaris and colleagues (2001-2002) call for

further research to "understand how on-line environments can be best designed to increase unplanned purchases" (p. 131). The current research tries to shed some light on this behavior. As a first step in a program of research, this research is intended to focus on the phenomenon of online impulse buying. This research endeavor attempts to examine the e-commerce interface characteristics that are necessary to increase the likelihood of the occurrence of online impulse purchases.

More specifically, the proposed research endeavor is intended to address the following two research questions:

RQ_1:   *What is online impulse buying and how does it manifest itself in the online context?*

RQ_2:   *What are the different interface characteristics that need to be present on the website to enhance online impulse buying?*

Drawing from different areas of research, such as information systems, consumer behavior, and environmental psychology, a model of online impulse buying was proposed, which provides an initial foothold for observing the phenomenon in an online context. An experimental study was devised to test the research model. Furthermore, four robust and realistic interfaces were intentionally designed to emulate existing websites. The use of a laboratory experiment allows the isolation of the impact of the different interface characteristics on online impulse buying. Through the precision offered by the chosen research method, the causality of the different relationships in the research model could be successfully established. Thus, valid conclusions can be drawn about the merits of the proposed model.

In the remainder of the chapter, the implications of this research endeavor to both research and practice are presented, followed by a presentation of a general layout of the dissertation.

1.2 Implications to Research and Practice

When undertaking a research project, the aim of any researcher should be to conduct research that is both rigorous and relevant. Rigor refers to the ability to draw valid conclusions about evidence and inference based on the research (Straub 1989), whereas relevance refers to the issues that are interesting and important to the practitioners. Thus, this dissertation makes an attempt to ensure both rigor and relevance in an attempt to make significant contributions to academia and practice. In the following subsections, the theoretical and practical implications of this study are discussed.

1.2.1 Theoretical Implications

The prevalence of impulse buying in an online context has piqued the interest of several researchers recently. While these studies have provided an initial foothold in the understanding of online impulse buying, a common theme emerging from these different studies is a call for research to understand the online impulsive buying behavior. The foremost contribution of this research endeavor to academia involves a theoretically grounded and tested model to explain and predict online impulse buying. Furthermore, an integral part of this research was to provide a detailed description of the distinct web characteristics that make impulse buying in an online context significantly different from traditional impulse buying. The use of two specific sets of beliefs from the literature on technology acceptance also provides an important contribution to

the information systems field. Finally, a multi-disciplinary approach was used to develop the proposed model. Consequently, this research endeavor has the potential to make significant contribution to the chosen reference disciplines, which include consumer behavior and environmental psychology. The theoretically grounded and empirically tested model of online impulse buying provided can be used as a strong foundation to study interesting phenomena within these fields of research.

1.2.2 Practical Implications

The knowledge generated as a result of this research endeavor can also be utilized to better practice. The most obvious contribution of this study is to online retailers and website designers. These practitioners can be offered clear guidelines to aid them in designing more effective marketing strategies as well as web interfaces that will attract consumers and engage them in an impulsive behavior. However, such a contribution has social implications. The online retailers can use the findings to unscrupulously take advantage of vulnerable online consumers. Thus, to protect the online consumer, the present research endeavor can serve as a foundation to educate and inform online consumers about the potential implications of online impulse buying. Moreover, different restraint strategies that apply to the online context are suggested and these would act as an interrupt in the online impulse buying process.

1.3 Structure of the Dissertation

The dissertation includes six sequential chapters that are labeled *Introduction and Research Questions*, *Literature Review*, *Research Model and Hypotheses*, *Research Approach and Methodology*, *Analysis Techniques and Results*, and *Discussion and Conclusion*. The

dissertation also consists of several appendices, which contain the measures of impulse buying, the results of pilot studies, the experimental signup materials, screenshots of the different interfaces, experimental task sheets, experimental materials, experimental script, background questionnaire, post questionnaire, and the assessment of discriminant validity. Table 1.1 provides a summary of the dissertation structure by listing the chapters, appendices, and their associated titles. In the next paragraphs, an overview of each chapter and each appendix is provided.

Table 1.1: Structure of the Dissertation

Chapter/Appendix	Title
Chapter 1	Introduction and Research Questions
Chapter 2	Literature Review
Chapter 3	Research Model and Hypotheses
Chapter 4	Research Approach and Methodology
Chapter 5	Analysis Techniques and Results
Chapter 6	Discussion and Conclusion
Appendix A	Impulse Buying Measures
Appendix B	Pilot Study Results
Appendix C	Experimental Signup Materials
Appendix D	Screenshots of Interfaces
Appendix E	Experimental Task Sheets
Appendix F	Experimental Materials
Appendix G	Experimental Script
Appendix H	Background Questionnaire
Appendix I	Post Questionnaire
Appendix J	Assessing Discriminant Validity

Chapter 1, *Introduction and Research Questions*, provides an introduction of the dissertation by broadly explaining the phenomenon under study. A general background of the

topic is provided along with justification for the need of this research endeavor and two specific research questions. The importance of this research both from a theoretical and practical standpoint is also provided.

Chapter 2, *Literature Review*, covers the relevant literature across different research disciplines, including information systems, consumer behavior, and environmental psychology. The reviewed literature is integrated to explain and predict the online impulsive buying behavior.

Chapter 3, *Research Model and Hypotheses*, introduces the proposed framework based on the relevant literature drawn from different research disciplines, such as information systems, consumer behavior, and environmental psychology. The specific hypotheses that are derived to empirically test the proposed theoretical model are presented along with the logic leading to each hypothesis.

Chapter 4, *Research Approach and Methodology*, provides the justification for the proposed research methodology as well as the description of a study that was used to test the proposed hypotheses. A comprehensive description of the chosen research method is provided, including information about the research design used, the sample, the interfaces used, the task performed, the variables used, and the procedure.

Chapter 5, *Analysis Techniques and Results*, provides a detailed description of the data analysis techniques used to test the hypotheses and the results. A comprehensive description is provided about the manipulation checks, a preliminary data analysis, and the chosen data analysis techniques. The chapter concludes with the results of hypothesis testing.

Chapter 6, *Discussion and Conclusion,* discusses the findings, limitations, implications,

and future work that extends the present research endeavor. The first section of the chapter

provides a detailed explanation of the results obtained in this study. The limitations of the

conducted study are then covered, followed by a discussion of the theoretical and practical

implications of this research. Additional areas of study are identified. Finally, the conclusions

drawn from this research study and the dissertation process are presented.

Appendix A, *Impulse Buying Measures*, provides the different measures that are available

to measure impulse buying. The items related to six different measures are provided.

Appendix B, *Pilot Study Results*, discusses the results obtained from two pilot studies.

The aim of the first study is to determine how online consumers prioritize e-commerce interface

characteristics. The objectives of the second study are to ensure the manipulation was salient, to

refine the experimental procedures, to conduct a preliminary construct validation process, and to

perform a preliminary test of the proposed hypotheses.

Appendix C, *Experimental Signup Materials*, includes all the materials that were used to

recruit students for the experimental study. It includes signup materials, the confirmation email

sent, the reminder email, and the number of experimental sessions conducted.

Appendix D, *Screenshots of Interfaces*, provides screen shots of different pages of the

four different websites used in the experiment. The availability or unavailability of the different

cues is explained with reference to the different interfaces. Screen shots from the different

interfaces are also provided in a table format to allow easy comparison.

Appendix E, *Experimental Task Sheets*, includes the different task sheets that the subjects

used to assess the different interfaces. Since different features were available on different

websites, four different versions of the task sheet are created to match the available features.

Appendix F, *Experimental Materials*, presents a document used in the study, which consists of the uniform resource locator (URL) for a short background questionnaire, the scenario, the URL for the experimental stimulus (depending on the group the subject was assigned to), the task list, and the URL for the post-experimental questionnaire

Appendix G, *Experimental Script*, contains the formal, written script that was used as control variables to ensure that the experimental sessions and procedures remained consistent across the different experimental groups.

Appendix H, *Background Questionnaire*, presents a short questionnaire, which captured the subject's age and gender as well as an average of the number of online purchases he or she has made so far. This information was used to determine whether there were any significant differences between the different experimental groups.

Appendix I, *Post Questionnaire*, presents the post-experimental questionnaire, which consisted of the independent variables, the dependent variables, and the measures for the manipulation check.

Appendix J, *Assessing Discriminant Validity*, depicts the different measurement models that were assessed to determine the discriminant validity of the four dependent variables used in this study.

1.4 Summary

This chapter introduced the dissertation by broadly explaining the phenomenon of online impulse buying. A general background of the topic is provided. There has been a call for future

research to understand the online impulse purchase behavior and the current research tries to shed some light on this behavior. Two specific research questions were proposed. The importance of this research both from a theoretical and practical standpoint was provided. Finally, the general outline of the dissertation was presented.

This next chapter provides a review of the prior literature which is relevant to the study of online impulse buying. The major theoretical underpinnings were drawn from consumer behavior, environmental psychology, and information systems disciplines. An extensive literature base is presented to provide a richer foundation for understanding the psychology and behavior in the context of online impulse buying.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of prior literature which is relevant to the study of online impulse buying. Since the impulse buying behavior has received interest from various researchers from different fields of research, an extensive literature base is presented to provide a richer foundation for understanding the psychology and behavior in the context of online impulse buying. The major theoretical underpinnings were drawn from consumer behavior, environmental psychology, and information systems disciplines.

This chapter is organized as follows. The first section covers the relevant impulse buying literature in the traditional shopping context. It also provides a review of the studies that have investigated impulse buying in an online context. A framework that has been drawn from environmental psychology and has been extensively used in the study of impulse buying is covered in the second section. Finally, a review of the technology acceptance model is provided, with a focus on a study that has extended the model to explain the acceptance of hedonic information systems.

2.1 Impulse Buying

Consumer decision-making has been studied extensively. The basic assumption underlying this body of knowledge is that consumers' choices can be explained from a rational perspective, where a choice is made after carefully considering the different options from a set of alternatives (Tversky and Kahneman 1974). However, in some cases, consumers violate these requirements of rationality. In such instances, choices are made without careful consideration of

the available alternatives, with insufficient information about the product of interest, or without prior intent of purchase (Tversky and Kahneman 1981). One such instance is impulse buying.

Impulse buying is a ubiquitous and unique aspect of consumers. Retailers realize the importance of this phenomenon, and through store layouts, product packaging, and in-store promotions, they have tried to get consumers to be impulsive in stores (Dholakia 2000). Over the years, impulse buying has also been made easier by innovations, such as credit cards, telemarketing, home shopping networks, and 24-hours retailing with the Internet (Rook 1987). Consequently, impulse purchasing accounts for a large volume of product sales every year (Hausman 2000). Because of its prevalence, researchers from different disciplines, such as consumer behavior and psychology, have shown interest in studying the impulse buying behavior. A review of this body of knowledge indicates that impulse buying has been mainly studied in a traditional commerce setting.

In the last decade, rapid developments in information technology have substantially changed the landscape of consumer behavior. The availability of 24-hour retailing through the Internet has brought about an increase in online retailing and inevitably, an increase in impulse buying. With the Internet, consumers' buying opportunities have expanded through an increased accessibility to products and services and the increased ease to make purchases. Moreover, this new mode of shopping often eliminates the constraints of time and space that are often experienced by shoppers in a traditional commerce context (Eroglu et al. 2001).

As a consequence, Internet shoppers can be more impulsive than traditional shoppers (Donthu and Garcia 1999). Indeed, there is preliminary evidence that indicates that impulse

buying is rampant in an online context (Greenfield 1999; Li et al. 2000). The distinct characteristic of an electronic commerce (e-commerce) context, in contrast to a traditional commerce setting, is that information technology (IT) mediates the relationship between the online consumer and the online retailer. Based on the preliminary evidence that this behavior is prevalent in an online context, an opportunity exists to identify the characteristics of the web interface that lead to impulse buying.

The primary purpose of the present research is to expand the concept of impulse buying to accurately encompass this behavior in an online context. To do so, the impulse buying literature is first reviewed. In the following section, previous research on impulse buying in a traditional shopping context is summarized. Next, studies that investigate impulse buying in an online context will be reviewed. The limitations of these studies that justify the need for the present research will also be discussed.

2.1.1 Impulse Buying in a Traditional Commerce Setting

The need to understand impulse buying in retail stores was first identified in the marketing literature over fifty years ago (Clover 1950). Ever since, many researchers from different areas of research, such as consumer behavior, economics, marketing, and psychology, have shown interest in studying this interesting and complex behavior in a traditional commerce context. These researchers have made significant contributions to our understanding of impulse buying. A review of this body of knowledge indicates that research on impulse buying in a traditional setting can be categorized in three general trends: definition, explanation, and extension. At first, researchers were primarily interested in *defining* the phenomenon. Second,

models were proposed to *explain* the impulse buying phenomenon. Finally, the focus has been to *extend* impulse buying research by identifying the various factors that increase or decrease impulse buying. In the next sections, each of these general trends is reviewed.

2.1.1.1 Defining Impulse Buying

In the beginning, researchers were primarily interested in understanding impulse buying. Researchers have invested considerable effort toward defining this interesting and complex phenomenon. The understanding of impulse buying has also been greatly improved through the identification of the different types of this behavior. Moreover, a distinction has been made between impulse buying and other forms of unregulated buying to gain a more in-depth understanding of this phenomenon. The focus of early studies was also on providing measures which can be used to capture this interesting behavior. In the next sections, a review of existing impulse buying literature is provided for a better understanding of the phenomenon.

2.1.1.1.1 Conceptual Definition of Impulse Buying

Several researchers have proposed varying conceptual definitions of impulse buying (e.g., Rook 1987; Rook and Hoch 1985; Weinberg and Gottwald 1982). Rook (1987), for example, defined it as an unplanned purchase which occurs when a consumer experiences positive affect when exposed to a stimulus. Piron (1991) conducted a review of these definitions and concluded that none of them fully described this interesting and complex phenomenon. He identified thirteen dimensions which were common across these various definitions of impulse buying proposed by different researchers. These thirteen dimensions are summarized in Table 2.1.

Table 2.1: The Thirteen Dimensions of Impulse Buying

Dimensions	Studies
Unplanned purchase	Davidson 1966; Engel and Blackwell 1982; McNeal 1973; Runyon 1977; Stern 1962
Response to stimulus	Stern 1962
Deliberately planned to benefit from offers	Day 1970; Loudon and Della Bitta 1984
Thrill seeking	Stern 1962
Decision made on the spur of the moment	Davidson 1966
Result of a deliberation process	McNeal 1973
Not a response to a previous problem	Engel and Blackwell 1982; Cobb and Hoyer 1986
No prior buying intentions	Engel and Blackwell 1982; Cobb and Hoyer 1986
Sudden and spontaneous desire to act	Rook 1987; Rook and Hoch 1985
State of psychological disequilibrium	Rook and Hoch 1985
Psychological conflict and struggle	Rook 1987; Rook and Hoch 1985
Reduction of cognitive evaluation	Rook and Hoch 1985
No evaluation of consequences	Rook 1987; Rook and Hoch 1985

Piron (1991) integrated these dimensions and proposed a comprehensive definition of impulse buying, which is as follows:

"Impulse buying is a purchase that is unplanned, the result of an exposure to a stimulus, and decided on-the-spot. After the purchase, the customer experiences emotional and/or cognitive reactions" (p. 512)

From this definition, the first characteristic of an impulse buying is that it is an *unplanned purchase*. The consumer decides to purchase the object on the spur of the moment, not in response to a previously recognized problem or an intention that was formed prior to being in the shopping environment (Piron 1991). The second characteristic of impulse buying is the *exposure to the stimulus*. According to the Merriam-Webster online dictionary, a stimulus is "something that rouses or incites to activity" or "an agent (as an environmental change) that directly influences the activity of a living organism or one of its parts" (Merriam-Webster OnLine). Thus, the stimulus can be considered as the catalyst which makes the consumer be impulsive. The

stimulus can be a piece of clothing, jewelry, or candy. Store atmospherics, which can be considered as an important factor in predicting impulse buying, allows the marketer to position products in an enticing way to increase impulse buying (Dholakia 2000). The third characteristic of impulse buying is the *immediate* nature of the behavior. The consumer makes a decision on the spur of the moment without any evaluation of the consequences of making such a purchase (Piron 1991). Finally, the consumer experiences *emotional and/or cognitive reactions*, which can include guilt or disregard for future consequences.

Weinberg and Gottwald (1982) have combined these characteristics into three important determinants of the impulsive buying process, which include the reactive component, the affective component, and the cognitive component. One of the characteristics of the impulse buying process is the exposure to the stimulus. Therefore, impulsive buying is a *reactive* behavior, in that the consumer shows certain responses when exposed to the stimulus in the purchase situation (Weinberg and Gottwald 1982). Another important characteristic is the immediate nature of the behavior. When exposed to the stimulus, the consumer feels an irresistible urge to buy the product of interest (Rook 1987). At this point, he or she is driven by emotional forces, such that the impulsive behavior is considered as being highly *affective*. Finally, because this behavior is reactive and highly affective, the consumer has very low intellectual control over the buying decision (Weinberg and Gottwald 1982). The consumer does not act consciously, but rather reacts to the presence of the stimulus, such that *cognitive* processes are kept to a minimum (Weinberg and Gottwald 1982).

2.1.1.1.2 Different Types of Impulse Buying

The understanding of impulse purchase was also greatly improved through the identification of the different types of impulse purchase by Stern (1962). According to him, there are four distinct types of impulse purchases, namely pure, reminder, suggestion, and planned impulse buying. *Pure impulse buying* occurs when consumers purchase products impulsively as defined above. This type of impulse purchase is a "novelty or escape purchase which breaks a normal buying pattern" (Stern 1962, p. 59). A *reminder impulse purchase* occurs when the consumer is reminded of the need to buy a product when he or she sees it (Stern 1962). The consumer may remember that he or she is running out of that product or may recall an advertisement about the item of interest, which sparks the impulse purchase. *Suggestion impulse purchase* is when a consumer sees a product and visualizes a need for it (Stern 1962). Finally, *planned impulse buying* is when consumers do not plan for their purchases, but search for and take advantage of promotions in the market (Nesbitt 1959).

The common link across these different types of impulse purchase is that the purchase is a result of an exposure to the stimulus (Piron 1991). To summarize these different types of impulse purchases, a continuum of impulse buying is presented, with planned impulse purchases on one extreme and pure impulse purchases on the other (see Figure 2.1).

The difference between these two extremes is the emotional appeal of the behavior. In the case of planned impulse buying, the consumer searches for and takes advantage of promotions, even though he or she did not have any intention to buy the product before entering the store (Nesbitt 1959). Nesbitt (1959) termed this form of impulse buying as "intelligent shopping" in

that the customer will only buy the product if there is a good promotion. The emotional appeal of this type of impulse buying is not high as the consumer only makes the purchase to increase his or her buying power (Nesbitt 1959).

Figure 2.1: The Different Types of Impulse Buying

Level of Emotional Appeal

→

| Planned Impulse Buying | Reminder Impulse Buying | Suggestive Impulse Buying | Pure Impulse Buying |
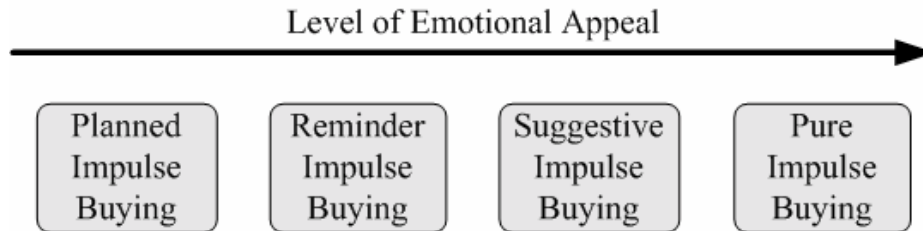
In contrast, in the case of a pure impulse purchase, the consumer feels the strong urge to buy the product, which breaks a normal buying pattern (Piron 1991). This type of behavior, thus, has strong emotional appeal. The distinction between suggestion and reminder impulse purchase is that, in the case of suggestion impulse buying, the consumer did not have prior knowledge of the product to assist in the purchase (Stern 1962). Therefore, suggestion impulse buying is considered to have more emotional appeal than reminder impulse buying. In this current research, the focus will be on pure impulse buying behavior in an online context.

2.1.1.1.3 Impulse Buying and Other Forms of Unregulated Buying

A distinction has been made between impulse buying and other forms of unregulated; namely compulsive buying and addictive buying. There is no clear distinction between compulsive and addictive buying, and the two terms are sometimes used interchangeably (Hirschman 1992). These types of buying lie on a continuum of unregulated purchase behavior, with impulse buying on one extreme and addictive or compulsive buying on the other end

(LaRose 2001). The difference between these two extremes lies in the level of control the consumer has over the behavior. In the case of impulse buying, the purchase is made only when the consumer is exposed to the stimulus (Rook 1987), which means that the individual has some control over the behavior. For instance, to regulate the number of impulse purchases, the consumer can stay away from a shopping environment. In contrast, compulsive buying behavior has been defined as "chronic, repetitive purchasing that becomes a primary response to negative feelings or events", and such behavior "becomes very difficult to stop and ultimately results in harmful consequences" (O'Guinn and Faber 1989). The consumer does not have much control over this behavior, always craving for the sense of relief that such a behavior brings.

2.1.1.1.4 Measuring Impulse Buying

An area of research on impulse buying has focused on conceptualizing and measuring impulse buying. A list of the most common measures used is provided in Table 2.2.

Table 2.2: Common Impulse Buying Measures

Construct	Source	Description
Impulsive Purchase Behavior	Rook and Fisher 1995	Degree to which a subject will make an impulsive purchase decision based on a scenario.
Buying Impulsiveness Scale	Rook and Fisher 1995	A consumer's tendency to buy spontaneously, unreflectively, immediately, and kinetically.
Buying Impulsiveness Scale	Donthu and Gilliland 1996	Degree to which a person not only indicates that he or she engages in unplanned consumer choice, but likes to purchase in that way.
Impulse Tendency Scale	Mick 1996	Extent to which a consumer is likely to make unplanned, immediate, and unreflective purchases.
Consumer Impulsiveness Scale	Puri 1996	Provides a measure of "people chronic values towards impulsiveness." (p. 89)
Impulse Buying Tendency	Weun et al. 1997	"Degree to which an individual is likely to make unintended, immediate, and unreflective purchases." (p. 306)

The assumption behind these various measures is that some individuals tend to be more impulsive than others. Therefore, the aim of these measures has been to capture the consumer's tendency to be impulsive. Consequently, these individuals who are impulsive will most likely be the ones engaging in an impulsive buying behavior. The different items within the different measures are available in Appendix A.

2.1.1.2 Explaining Impulse Buying

Researchers from economics and psychology have proposed theoretical models or frameworks to explain the impulse buying behavior. The next sections provide a review of the most common models. The six theoretical models or frameworks that will be reviewed include the reference point model proposed by Hoch and Loewenstein (1991), a model of impulse buying proposed by Dittmar, Beattie, and Friese (1995), a theoretical model of impulse buying proposed by Dittmar and colleagues (1996), the two-factor cost-benefit accessibility framework proposed by Puri (1996), a model of environment-shopper relationships proposed by McGoldrick and colleagues (1999), and Dholakia's (2000) integrated model of consumption impulse formation and enactment.

2.1.1.2.1 The Reference Point Model

Hoch and Loewenstein (1991) proposed the reference point model that explains how and why consumers are impulsive. The authors explain the concept of the reference point, whereby "people are less concerned with absolute attainments than with attainments relative to some psychologically relevant comparison point" (p. 494). In other words, when exposed to the stimulus, the consumer feels the urge to own it (Rook 1987). Consequently, there is a shift in the

consumer's reference point in that he or she already imagines owning the product. Not acquiring the product is considered as a loss and the consumer purchases the product to minimize the loss (Hoch and Loewenstein 1991). At that point in time, the benefits of immediate gratification outweigh any future considerations, such as monetary issues (Dittmar and Drury 2000).

There are several situations that can cause shifts in the consumer's reference point, and as a consequence, promote his or her impulsivity. In most of these situations, the consumer's proximity to the product is promoted in one way or the other. These different situations include physical proximity, temporal proximity, and social comparison (Hoch and Loewenstein 1991). The product of interest is the catalyst in the impulse buying process and the *physical proximity* increases the desire to acquire it. Indeed, store atmospherics has been found to be an important factor in predicting impulse purchase (Dholakia 2000). Placing an object in view or in an attractive setting has been found to lead to a reference shift (Mischel and Grusec 1967). *Temporal proximity* to the product also leads to a reference point shift. In other words, in addition to the physical proximity to the product, the possibility of immediate gratification or an immediate "reward" increases the desire to own the product. Finally, *social comparison* can also cause a shift in the consumer's reference point. The effect of social comparison on impulsivity is evident (Dittmar et al. 1995). Individuals compare themselves with their peers who are slightly better off than them and consequently, want to possess what their peers already have.

This model is crucial to understanding the impulsive buying behavior. More specifically, it emphasizes the importance of understanding the consumer's perceptions of the product as well as the shift in the consumer's reference point when predicting impulse buying. However, while

the model explains why consumers buy impulsively, it has a major limitation in that it does not explain why certain product categories are bought impulsively, while others are not.

2.1.1.2.2 A Model of Impulse Buying

Dittmar and colleagues (1995) proposed a model of impulse buying to address the limitation of the previous model. Drawing from the social constructionist perspective and the psychology of material possessions, the model addresses the meaning dimensions in impulse purchases (see Figure 2.2). The main assumption of this model is that consumers no longer buy products only for their functional benefits, but also for their symbolic meanings. Products are consumed for their symbolic meaning in that they give an indication of the social standing, wealth, and social status of an individual.

Figure 2.2: Meaning Dimensions in Impulse Purchases

(from Dittmar et al. 1995)
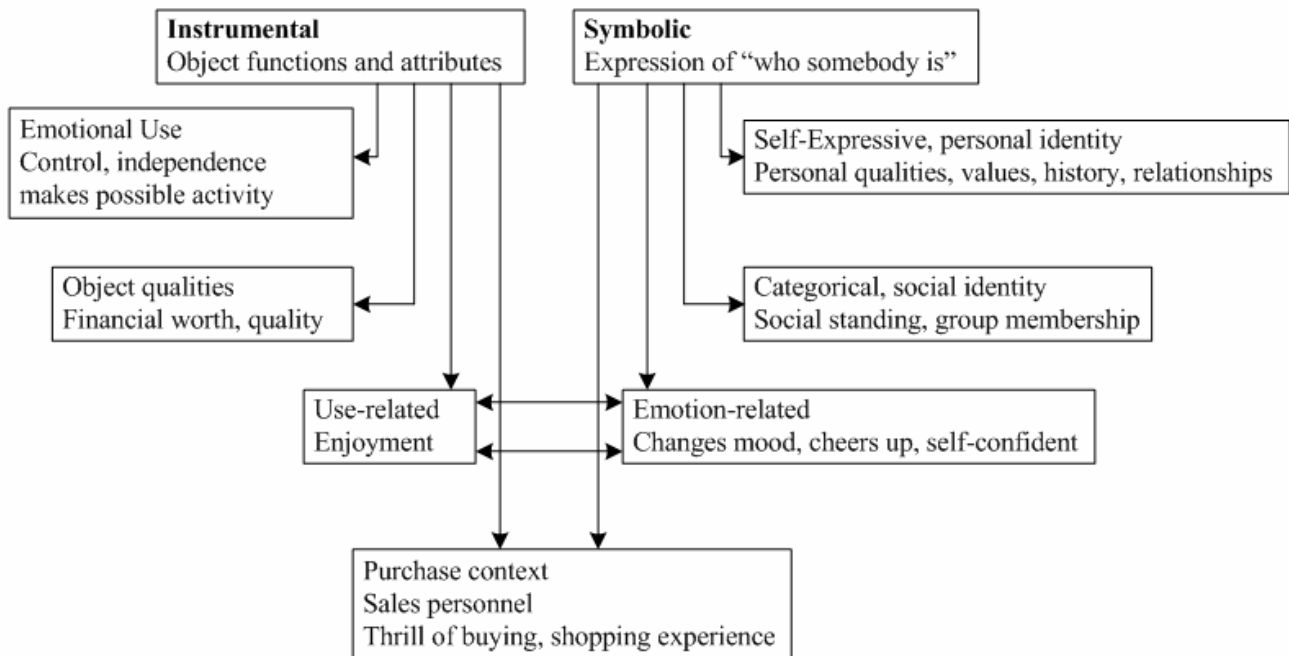
This model distinguishes between the functional uses of products and their meanings as symbols of identity. The authors provide a validation of this model through individual interviews of a mature student population and also tested how men's and women's impulse buys differ along this continuum. The main finding was that the primary difference between products that are bought impulsively and those that are not is that these products are better expressions of the individual's identity. It was also found that women who are impulsive buyers tend to purchase products that express their emotional and appearance concerns, while men who are impulsive buyers tend to buy products that are more functional.

2.1.1.2.3 A Theoretical Model of Impulse Buying

Building on their findings from the study mentioned in the previous section, Dittmar and colleagues (1996) provided a more comprehensive theoretical model of impulse buying, which also addresses the limitation of the reference point model proposed by Hoch and Loewenstein (1991) (see Figure 2.3). This model draws from the symbolic self-completion theory (Wicklund and Gollwitzer 1982), the notion of materialism proposed by Richins and Dawson (1992), and Higgins' (1987) concept of self-discrepancies.

The main premise of the concept of self-discrepancies is that there are discrepancies between how an individual sees his or her self (the actual self) and how he or she would ideally wish to be (the ideal self) (Higgins 1987). According to the self-completion theory, individuals compensate for these discrepancies or shortcomings in the perception of one's self in various ways (Wicklund and Gollwitzer 1982). These compensating strategies include acquiring and using material symbols that are relevant to those aspects of the self that are perceived as being

missing. The notion of materialism provides evidence that individuals use product acquisition as

a self-completion strategy (Richins and Dawson 1992). Indeed, the acquisition of material goods

is now a central goal in many individuals' life and is also considered as being a prime indicator

of success and key to happiness.

Figure 2.3: The Theoretical Model of Impulse Buying

(from Dittmar et al. 1996)
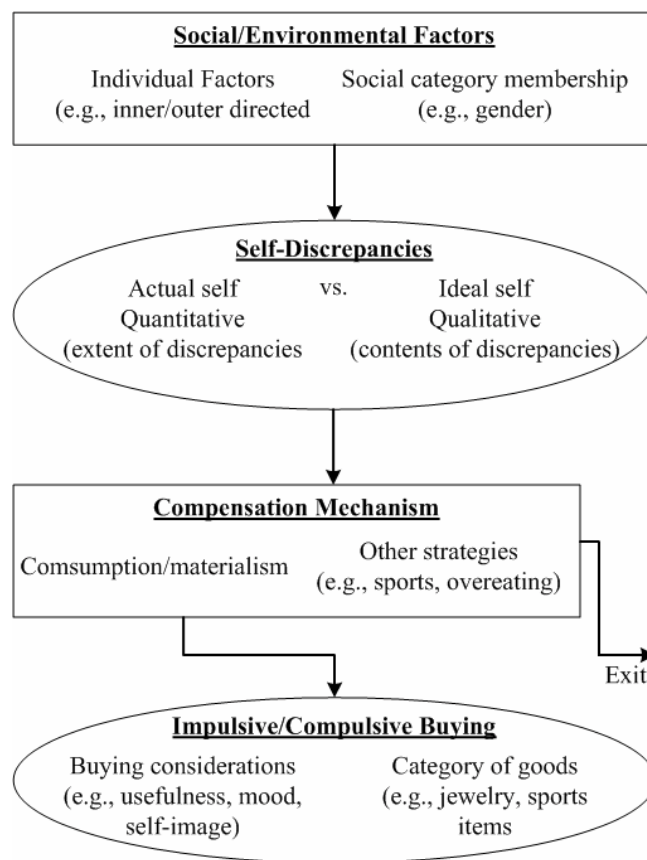
The theoretical model of impulse buying uses these different concepts, the basic premise

being that consumers differ in the goods that they buy impulsively along the lines of the social

categories in which they belong. Such social categories are powerful determinants of a person's

sense of self. More specifically, an individual who perceives that there is a discrepancy between

his or her actual self and his or her ideal self and who is prone to use material goods as a strategy to compensate for this discrepancy should have excessive impulse buying tendencies. The model predicts that variables such as an individual's materialism, degree of self-discrepancies, gender, and compulsive shopping tendencies will help to predict what types of products this individual would typically buy as well as the reasons for the purchase.

The main premise of both models proposed by Dittmar and colleagues (1995; 1996) is that consumers purchase products impulsively because of the perceived self-discrepancies. In both cases, the authors specify that they do not consider this motivation to be the only reason for impulsive buying (Dittmar 2001). The authors believe that the conjunction of self-discrepancies and materialism together explain the impulse buying behavior. While both of these model address the limitations of the reference point model proposed by Hoch and Loewenstein (1991), one limitation of these models is that they only consider why individuals buy impulsively, but fail to consider the aspects of the situation in which the individuals are impulsive.

2.1.1.2.4 The Two-Factor Cost-Benefit Accessibility Framework

Puri (1996) proposed a two-factor cost-benefit accessibility framework which addresses this limitation. The model draws from research on impulsiveness, self-control, and time-inconsistent preferences and builds on a hedonic framework, according to which an individual feels an irresistible urge to buy a product when he or she is exposed to it. According to the concept of time-inconsistent preferences, when the consumer is exposed to the stimulus, the benefits of immediate gratification outweigh any future considerations, such as monetary issues (Dittmar and Drury 2000).

The basic premise of this model is that impulsivity depends on the degree to which the situation emphasizes the negative costs of impulsiveness, the benefits of acquiring the product or both, and the propensity of an individual to be impulsive (see Figure 2.4). In situations in which the benefits outweigh the costs, the temptation to succumb to the felt urge is high and is the compelling force of impulsiveness. In contrast, when the costs of impulsiveness are more salient than the benefits, the individual resists the urge, which decreases the likelihood of any impulsive behavior.

Figure 2.4: The Two-Factor Cost-Benefit Accessibility Framework

(from Puri 1996)
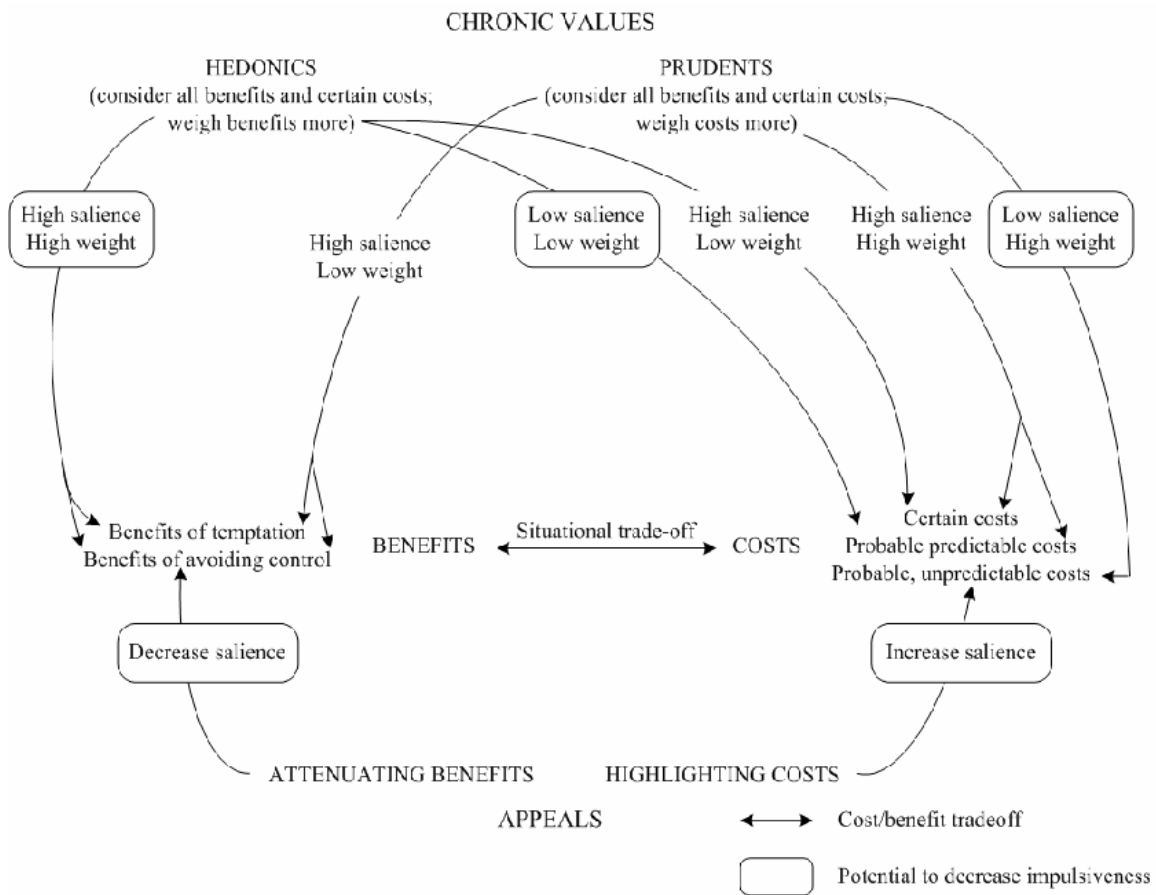
Whether a person focuses on the benefits or the costs of impulsiveness depends on the consumer's chronic values. Certain individuals have more hedonic values and therefore, are more naturally inclined to mainly focus on the benefits of impulsiveness, rather than considering the costs. Puri (1996) refers to those individuals as "hedonics". In contrast, other individuals may be more prudent and only consider the costs of impulsiveness. These individuals are known as the "prudents". Because hedonics only consider the benefits of impulsiveness, they tend to be impulsive, while the prudents do not generally behave impulsively. The interplay between the situational factors and the consumer's propensity to be impulsive determines the likelihood of impulsiveness.

2.1.1.2.5 A Model of Environment-Shopper Relationships

Bitner (1992) has proposed that consumers produce cognitive responses when exposed to environmental cues and based on these responses, they exhibit either an approach or an avoidance behavior. McGoldrick and colleagues (1999) follow this premise to propose a model of environment-shopper relationships, which is based on the causal flow from perception through beliefs to behavior that is key in social attitude theories, such as the theory of reasoned action (Fishbein and Azjen 1975). The authors examine the influence of various moderators on these different paths (see Figure 2.5) and validate the proposed model in the context of seasonal sales.

According to the model, there are two moderators of the relationship between the environment and the customer response, namely the customer's socio-demographic characteristics and his or her cognitive characteristics. A consumer's socio-demographic status determines his or her response to the environment, and consequently the likelihood of an impulse

purchase. Indeed, it has been found that gender (Dittmar and Drury 2000; Dittmar et al. 1995) and age (Bellenger et al. 1978) are determinants of the propensity of an individual to be impulsive. Similarly, an important factor in the impulse buying process is the amount of money the consumer possesses (Beatty and Ferrell 1998). The customer's response also depends on his or her beliefs and images about the environment. For instance, in the case of seasonal sales, some consumers will be looking forward to the savings they can make, while other consumers will only think about the inconveniences of shopping in the sales, such as long lines and the crowd.

Figure 2.5: A Conceptual Model of Environment-Shopper Relationships
(from McGoldrick et al. 1999)
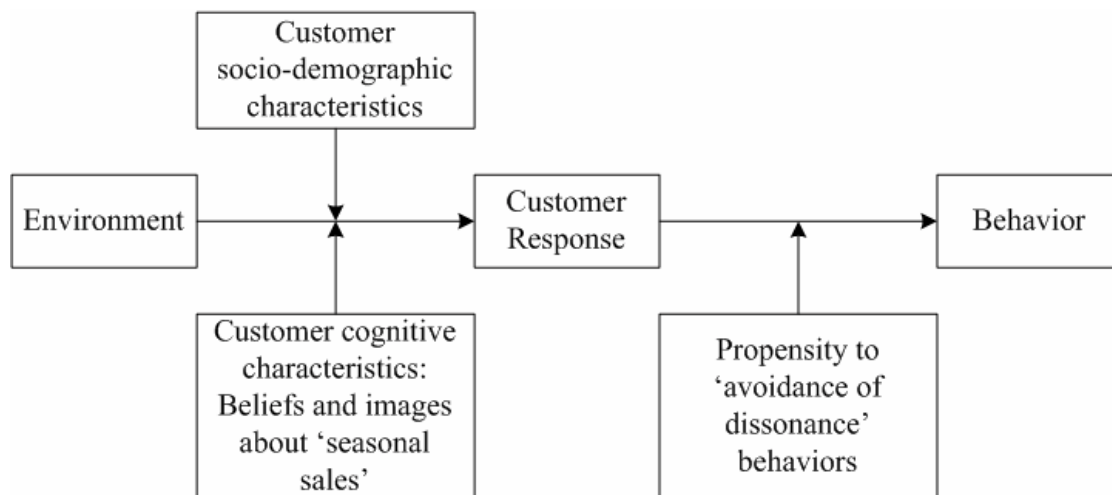
The propensity to 'avoidance of dissonance' behaviors moderates the relationship between the consumer's response to the environment and the resulting behavior. One of the consequences of an impulse purchase is regret when the consumer incurs the costs of impulsiveness after the purchase. This dissonance expectation causes the consumer to feel pressured since he or she has to defend or justify the decision made. As indicated by Piron (1991), one of the characteristics of the impulse buying process is that the consumer does not

evaluate the consequences of the impulsive behavior. In a similar way, at the point of purchase, the consumer may avoid to consider the post-purchase dissonance. This can be done by only considering any information that is congruent with the decision, such as the savings from a sale.

Since impulse buying is a behavior that results from an exposure to a stimulus, research from environmental psychology can be used to understand this interesting behavior. This model builds on this premise and provides an interesting explanation of the impulse buying. However, the study proposed by McGoldrick and colleagues (1999) have one serious limitation in that the proposed model only applied to seasonal sales, which limits the generalizability of the findings.

2.1.1.2.6 An Integrated Model of Consumption Impulse Formation and Enactment

Dholakia (2000) has proposed one of the most detailed theoretical frameworks that explains the impulse buying process. The main premise of this framework is that the impulsive behavior consists of a series of behaviors that involve motivational, volitional, and cognitive psychological processes. The model explains the role of these psychological mechanisms in the impulse buying process, as shown in Figure 2.6.

Three antecedents of the impulse buying behavior are identified, namely the marketing stimuli, the impulsivity trait, and situational factors. One of the vital factors in the impulse buying process is the exposure to the *marketing stimulus* (Rook 1987). Indeed, marketers increase the likelihood of impulse purchases by manipulating store atmospherics (Dholakia 2000). Moreover, physical and temporal proximity to the product also increases the consumer's impulsiveness (Hoch and Loewenstein 1991). *Situational factors* refer to both environmental and personal factors that are present when the consumer makes the impulse purchase. For instance,

the amount of money the consumer owns, which is an example of an environmental factor, will

increase likelihood of an impulse purchase (Beatty and Ferrell 1998). An example of a personal

factor is the mood of the consumer, which has been found to be an important determinant of the

impulse buying process (Beatty and Ferrell 1998). Finally, the *impulsivity trait* refers to a

consumer's propensity of being impulsive (Rook and Fisher 1995) and this factor has been found

to be an important determinant in the impulsive buying process. The presence of one or more of

these three factors is sufficient to bring about the urge to buy spontaneously.

Figure 2.6: The Integrated Model of Consumption Impulse Formation and Enactment (from Dholakia 2000)
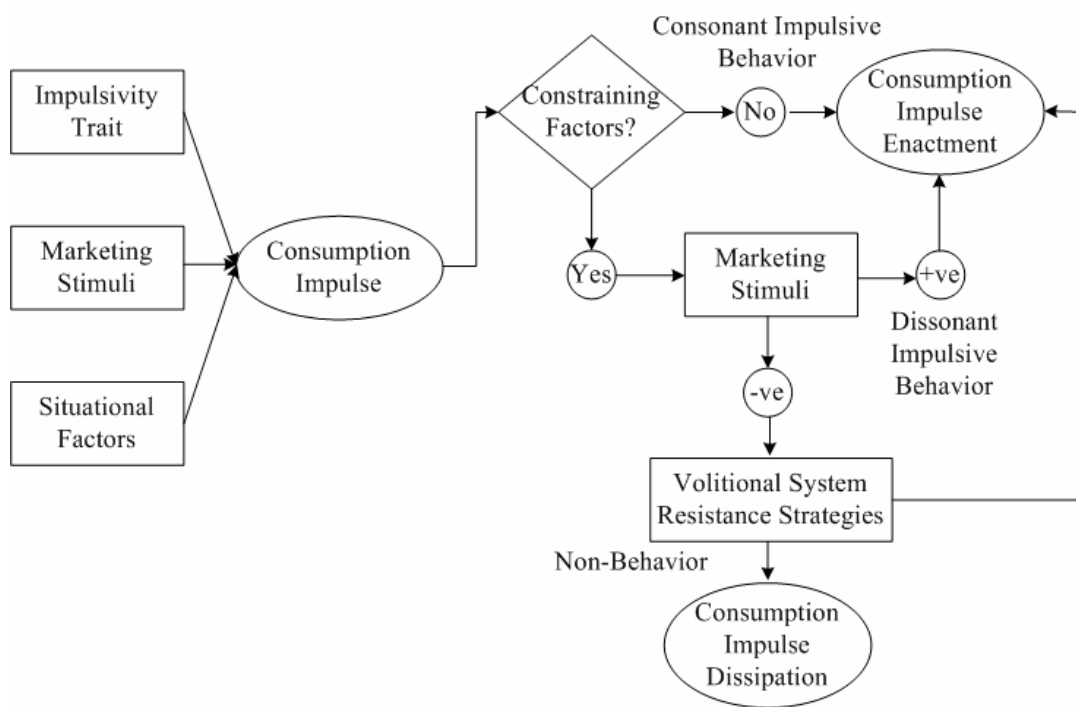
When the consumer experiences the urge to buy spontaneously, certain mental responses

are automatically triggered to determine the presence of any factors that will constrain the

impulsive behavior. Three constraining factors have been identified, which include current

impediments, consideration of long-term deleterious consequences, and anticipatory emotions. In the case of *current impediments*, certain situational factors, such as the availability of money or time, can disrupt the smooth and rapid flow of the impulse buying process (Beatty and Ferrell 1998). The *consideration of long-term consequences* can bring the consumer to think of the serious costs of impulsiveness, which will cause him or her to deter the purchase. Finally, the *anticipatory emotions* in the form of negative emotions, such as regret, can cause the consumer to resist the felt urge to buy spontaneously. If these restraining factors are present, the consumer will experience conflict. In contrast, if there are no identified restraining constraints, the consumer will respond to the urge and buy the product "on-the-spot" (Rook 1987).

In the presence of restraining factors, the consumer will consider the pros and cons of purchasing the product. This is a quick process, which may result in a positive or negative evaluation. If the evaluation of the pros and cons of being impulsive is positive, the consumer will still purchase the product, since the benefits of such a behavior are higher than the costs that will be incurred. In the event of a negative evaluation, the consumer uses different resistance strategies to deter the purchase of the product. By using these strategies, the consumer can regulate his or her mental state, through self-control or avoidance of the stimulus.

2.1.1.3 Extending Impulse Buying Research

Consumer behavior and marketing researchers have mainly focused on identifying the general factors that increase impulse buying. These factors can be classified in four general categories, namely the consumer's characteristics, the store characteristics, situational factors, and product characteristics. Each of these general categories is next explained in this section.

2.1.1.3.1 Consumer Characteristics

Consumer's characteristics include any individual characteristic or trait that increases the consumer's propensity to be impulsive. These characteristics include the consumer's age, gender, culture, mood, materialism, shopping enjoyment, impulsive buying tendency, and the perceived degree of self-discrepancies. Table 2.3 provides a list of the different authors who have studied these consumer's characteristics.

Age has been found to be an important determinant in predicting impulse buying in that younger people face fewer risks when spending money (Bellenger et al. 1978). Several researchers have studied the effect of *gender* on impulse buying and the main finding of these studies is that women tend to be more impulsive than men (e.g., Dittmar et al. 1995).

Culture has an influence on impulse buying both at the regional and individual levels (Kacen and Lee 2002). An individual's affective state or mood has been found to be an important determinant of impulse buying, in that if an individual is in a good *mood*, he or she tends to reward himself or herself more generously and therefore, tend to be more impulsive (Beatty and Ferrell 1998). The notion of *materialism* indicates that individuals who use product acquisition as a self-completion strategy tend to be more impulsive (Richins and Dawson 1992).

Various individual difference variables have shown to affect impulse buying. The first one of them is *shopping enjoyment*, whereby individuals consider shopping as a form of recreation (Bellenger and Korgaonkar 1980). These individuals do not stick to a buying list, and therefore, tend to make many impulsive purchases (Beatty and Ferrell 1998).

Table 2.3: Consumer Characteristics and Impulse Buying

	1	2	3	4	5	6	7	8
Bellenger et al. 1978	x							
Bellenger and Korgaonkar 1980						x		
Hirschman 1980						x		
Donovan and Rossiter 1982				x				
Weinberg and Gottwald 1982				x				
Rook 1987				x		x	x	
Gardner and Rook 1988				x				
Richins and Dawson 1992					x			
Rook and Gardner 1993				x				
Dittmar et al. 1995		x						x
Rook and Fisher 1995							x	
Burroughs 1996								x
Dittmar et al. 1996		x		x	x		x	x
Puri 1996							x	
Weun et al. 1997							x	
Beatty and Ferrell 1998				x		x	x	
McGoldrick et al. 1999	x							
Dholakia 2000				x			x	
Dittmar and Drury 2000		x		x				
Hausman 2000						x		x
Youn and Faber 2000				x				
Dittmar 2001		x		x	x		x	x
Giraud 2001		x		x				
Kacen and Lee 2002			x					
Crawford and Melewar 2003						x	x	
Jones et al. 2003							x	
Mai et al. 2003	x		x					
Luo 2004								x
Sharma and Sivakumaran 2004						x		
1: Age				2: Gender				
3. Culture				4: Mood				
5: Materialism				6: Shopping Enjoyment				
7: Impulse Buying Tendency				8: Degree of Self-Discrepancies				

Another important individual variable is a consumer's *impulse buying tendency*, which determines an individual's propensity to buy impulsively (Rook 1987). Several researchers have tested and found support for the relationship between this consumer trait and impulse buying

(e.g., Beatty and Ferrell 1998). The premise of the concept of *self-discrepancy* is that there are discrepancies between how an individual sees his or her self (the actual self) and how he or she would ideally wish to be (the ideal self) (Higgins 1987). Therefore, an individual who perceives that there is a discrepancy between his or her actual self and his or her ideal self and who is prone to use material goods to compensate for this discrepancy should have excessive buying tendencies (Dittmar et al. 1996).

2.1.1.3.2 Store Characteristics

Several properties of the store environment promote impulse buying. These include the store layout, the store atmospherics, the store type, and the presence of a salesperson. Table 2.4 provides a list of the studies that have investigated the effect of these store properties on impulse buying.

The store layout has been found to be an important determinant of unplanned purchases (e.g., Iyer 1989). In general, marketers should promote a good *store layout* to maximize the convenience of the consumer (Crawford and Melewar 2003). Related to this notion of the store layout, the presence of a salesperson has been found to help in the impulse buying process (e.g., (Crawford and Melewar 2003). A *well-trained salesperson* can decrease frustration by guiding and aiding the consumer in the purchase process. Another technique which is available to the marketer to increase impulse purchases is the manipulation of *store atmospherics*. The stimulus is presented to the consumer in an enticing way, which may trigger the impulse buying process. Finally, consumers tend to be impulsive in *different stores*. For example, it has been shown that many impulse purchases result in grocery shops (Iyer and Ahlawat 1987).

Table 2.4: Store Characteristics and Impulse Buying

	1	2	3	4
Kotler 1973-1974			x	
Bellenger and Korgaonkar 1980				
Iyer and Ahlawat 1987				
Iyer 1989			x	
Abratt and Goodey 1990		x		
Piron 1991				x
Rook and Fisher 1995		x		
Puri 1996			x	
Beatty and Ferrell 1998			x	
McGoldrick et al. 1999			x	
Dholakia 2000			x	
Hausman 2000			x	
Youn and Faber 2000			x	
Crawford and Melewar 2003	x	x	x	x
Zhou and Wong 2003			x	
1: Store Layout	2: Store Atmospherics			
3: Store Type	4: Presence of Salesperson			

2.1.1.3.3 Situational Factors

Situational factors refer to both environmental and personal factors that are present when the consumer makes the impulse purchase (Dholakia 2000). These include the time available, money available, the presence of others, and in-store browsing. Table 2.5 provides a list of the studies that have investigated the effect of these situational factors on impulse buying.

The *time* a consumer has for shopping determines whether he or she will be impulsive. Time pressure has been found to have a negative effect on impulse buying as the consumer may feel frustrated due to the lack of time to shop or browse (Beatty and Ferrell 1998). The more time an individual has, the longer time he or she will spend browsing the shopping environment. *In-store browsing* has been found to be an important component of the impulse buying process

(Beatty and Ferrell 1998). Browsers usually make more unplanned purchases than non-browsers

(Jarboe and McDaniel 1987).

Table 2.5: Situational Factors and Impulse Buying

	1	2	3	4
Iyer and Ahlawat 1987	x			
Jarboe and McDaniel 1987				x
Iyer 1989	x			
Abratt and Goodey 1990		x		
Hoch and Loewenstein 1991	x	x		
Rook and Fisher 1995			x	
Beatty and Ferrell 1998	x	x		
Dholakia 2000		x		
Hausman 2000			x	
Crawford and Melewar 2003		x		x
Mai et al. 2003		x		
Luo 2004			x	
1: Time available	2: Money Available			
3: Presence of others	4: In-Store Browsing			

The *availability of money* is a facilitator in the impulse buying process (Beatty and Ferrell

1998), since it increases the purchasing power of the individual. If the individual does not have

enough money, he or she will avoid the shopping environment altogether. The *presence of others*

can increase the likelihood of an impulse purchase (Luo 2004). For example, when individuals

are in a group, they tend to eat more. On the other hand, the presence of others can have a

deterring effect on the consumer, when he or she feels that the behavior will be perceived as

being irrational (Rook and Fisher 1995). In those cases, the consumer will choose to make the

purchase when he or she is alone.

2.1.1.3.4 Product Characteristics

Certain products are bought more impulsively than others. The likelihood that a product will be purchased on an impulse depends on the product category, the product price, and the symbolic meaning associated with the product. Table 2.6 below provides a list of the studies that have investigated the effect of these product characteristics on impulse buying.

Table 2.6: Product Characteristics and Impulse Buying

	1	2	3
Kotler 1973-1974		x	
Bellenger et al. 1978	x	x	
Bellenger and Korgaonkar 1980			
Cobb and Hoyer 1986		x	
Rook 1987		x	
Abratt and Goodey 1990	x	x	
Hoch and Loewenstein 1991		x	x
Piron 1991	x		
Dittmar et al. 1995			x
Burroughs 1996			x
Dittmar et al. 1996		x	x
Beatty and Ferrell 1998			
McGoldrick et al. 1999	x		
Dittmar and Drury 2000	x		
Dittmar 2001	x	x	
Giraud 2001		x	
Crawford and Melewar 2003	x		
Jones et al. 2003		x	
Mai et al. 2003		x	
Zhou and Wong 2003	x		
1: Product Price 2: Product Line 3: Symbolic Meaning			

The marketing literature has proposed that there are two *product categories*: hedonic products or functional products. Hedonic products are mainly consumed for their hedonic benefits, while functional products are consumed for their utilitarian benefits (Babin et al. 1994). It has been found that impulse buying occurs more in the case of hedonic products. An individual

who perceives that there is a discrepancy between his or her actual self and his or her ideal self and who is prone to use material goods to compensate for this discrepancy should have excessive buying tendencies (Dittmar et al. 1996). The individual will buy these hedonic products because of the *symbolic meaning* they convey. *Product price* has also been found to be an important determinant of impulse buying (e.g., Zhou and Wong 2003). More specifically, consumers tend to be more impulsive when there are sales or product discounts.

2.1.2 Impulse Buying in on Online Context

The studies reviewed have made a significant contribution to the understanding of impulse buying in a traditional shopping context. The progression of the impulsive buying behavior to the Internet leads to a logical extension of exploring the information technology (IT) characteristics in an online context. More specifically, theoretical frameworks should be developed to understand and predict online impulse buying. Before this can be done, there is a need to understand what makes impulse buying in an online context different from traditional impulse buying. This distinction is paramount before existing impulse buying literature from the traditional context can extended to an online context. Dubin (1978) indicates that one of the features of a theory is its boundaries, within which the theory is expected to hold. If a researcher tries to apply an existing theory or concept to a new context without understanding how this new context is different from existing ones, then it is very likely that the theory will not hold.

The next subsection begins with the identification of the distinct characteristics of online impulse buying, before existing online impulse buying literature is reviewed. Then, a summary

of what is known about online impulse buying is provided, which provides justification for the current research.

2.1.2.1 Distinct Web Characteristics and Online Impulse Buying

Shopping on the Internet has offered consumers a very convenient and easy means of shopping (Szymanski and Hise 2000). There are no more lines or closing times. The web stores are available "7 days a week, 24 hours a day, and 365 days a year" (Rayport and Jaworski 2001, p. 5). Consequently, the consumer can browse the product offerings of various e-retailers at any time. Moreover, online shoppers can save time and effort since it is so easy to locate retailers, find products, and buy them in the comfort of their homes (Madhavaram and Laverie 2004). These features significantly increase the convenience and ease of shopping. For instance, at website such as Amazon.com, not only does the consumer have a wide range of products from which to choose from, but also has one-click ordering, which makes the purchasing process very easy. There is a positive relationship between the ease of buying and impulse buying (Stern 1962). Similarly, the concept of browsing has been associated with increased impulsive buying (Beatty and Ferrell 1998). These are the primary reasons why there are more unplanned purchases on the Internet than in a traditional setting.

Online merchandising has also been considered as an advantage of online shopping. Merchandising here refers to the "factors associated with selling offerings online separate from site design and shopping convenience" (Szymanski and Hise 2000, p. 312) and includes the product offerings and information about the product. In an online setting, consumers are presented with a vast assortment of products. For example, a video store would only carry few

thousands of video titles, while an online movie rental store will carry millions of titles. Moreover, the cost of finding one particular title in a video store is much higher than that in an online store. The consumer is also provided with helpful information, such as product reviews, on which to base their decision.

Personalization is another aspect of a website that enhances online purchasing, whereby each visitor is considered as an individual and the website content is tailored to the needs and preferences of the individual (Chakraborty et al. 2003). This feature allows the visitor to control the type of information he or she wants to view. Consequently, the individual gets more relevant information and also, targeted advertisements. Personalization thus keeps out unwanted information or products, reduces the effort needed to filter unwanted information, improves the accuracy of searches, and increases the ease and speed of making a transaction (Chakraborty et al. 2003). For example, a consumer can choose to receive emails from an e-retailer about products of interest and based on those emails, make a decision to buy a product without the need of an extensive search. At the same time, the retailer can track the purchasing patterns of the consumer and recommend new products. For example, at an online clothing store, different garment pieces and accessories are recommended when a consumer is reviewing a product.

With this new mode of shopping, the consumer can review product from various vendors or use websites, such as www.bestbuys.com, to compare the prices of the same product across different vendors. In an offline setting, it can be very inconvenient to go to several shops in order to find the best deal. In comparison, it is very easy and quick to make price comparisons on the Internet. Such price comparisons enhance competition among the online vendors, which can be

beneficial to the consumer. Price has been found to be an important determinant in impulse buying (Zhou and Wong 2003).

There are also several web characteristics that make online impulse buying more difficult. First, with online retailing, the consumer has to rely on visual cues only, since the interface lacks sensory cues, which are available in a traditional commerce setting. However, marketers have found ways to enhance the shopping experience. For instance, different media formats are used to display information about the product. The product pictures can be enlarged and color samples can be viewed in addition to any information in the form of text. Moreover, at music sites, such as www.itunes.com, the consumer can preview a sample of a song before buying it. The use of multi-media can trigger emotions just as in-store displays would. Online retailing does not allow the consumer to try any of the products. However, product reviews can compensate for the lack of product trials.

One of the driving forces of the impulse buying behavior in a traditional commerce setting is immediate gratification after the product of interest has been purchased. However, in the case of online retailing, product delivery is deferred by a number of days, unless the product being purchased is software or music. Therefore, this situation does not necessarily promote impulse buying. However, it has been proposed that the consumer fulfills the urge to buy impulsively by the mere act of acquiring the product, rather than actually possessing it (LaRose 2001). In other words, in the context of online shopping, immediate gratification is derived from the purchasing transaction rather than the actual delivery of the product. Therefore, the online shopping environment can be more conducive to impulse buying than the traditional shopping

environment, since it allows the consumer to satisfy any urges to buy impulsively easily and at practically any time.

2.1.2.2 A Review of Online Impulse Buying Literature

To date, few researchers have provided theoretical frameworks for studying impulse buying in an online context. LaRose (2001) was among the first researchers to study online impulse buying and his contribution was to provide an explanation of online unregulated buying. The next study was by Koufaris and colleagues (2001-2002) who examined the factors that lead to unplanned purchases online. This was followed by a study which used the technology acceptance model (TAM) to investigate unplanned purchases on the Internet (Koufaris 2002). Adelaar and colleagues (2003) used the environmental psychology approach to study the effect of three different media formats of web pages on impulse buying intent. Finally, more recently, Dutta and colleagues (2003) have examined how the implementation characteristics of online payment processes affect impulse buying.

2.1.2.2.1 A Sociocognitive Exploration of Unregulated On-Line Buying

According to the social cognitive theory (Bandura 1999), humans are aware of their own behavior and its consequences, and therefore can exercise caution when planning future behavior. This concept has been extended to the context of addictions where it is believed that people can avoid addictions through self-regulation (Bandura 1999). LaRose (2001) draws from these notions to examine indicators of self-regulation mechanisms in the content presented at popular e-commerce sites. The author conducted an ethnographic content analysis to identify novel strategies that influence self-regulation on the web.

Several features that encourage or discourage unregulated buying were identified on these sites. Features that promote self-regulation have a deterring effect on impulse buying. Examples of these features include the display of the price next to the product picture, wish lists, and summaries of past purchase histories. In contrast, certain features, such as product reviews, sweepstakes, and notices of auction closings, promote impulse buying. The author provides some ways in which a marketer can undermine a consumer's self-regulation or increase a consumer's impulsiveness.

This study uses an ethnographic approach, which involves an inductive approach rather than a deductive one. This provides rich information about the phenomenon. However, the research was only exploratory in nature and that no causal relationship can be established between e-commerce and unregulated buying. Moreover, the findings only apply to the small number of websites that was visited.

2.1.2.2.2 Consumer Attitudes and Behavior on the Web

Koufaris and colleagues (2001-2002) used the environmental psychology literature and emerging information systems and marketing research to examine the factors that lead to increased consumer loyalty and unplanned purchases. The model studies the direct or moderating effect of individual and environmental (web store) factors on consumer attitudes and behavior (see Figure 2.7). The consumer behaviors studied were the intention to return and unplanned purchases; the attitudinal factors studied were perceived control and shopping enjoyment; the individual factors studied were customer tenure, need specificity, and product involvement; and

the environmental factors studied were search mechanisms and challenges. The authors validate

the model in the context of a Web-based video rental and delivery store.

Figure 2.7: Theoretical Framework for Consumer Attitudes and Behavior on the Web

(from Koufaris et al. 2001-2002)
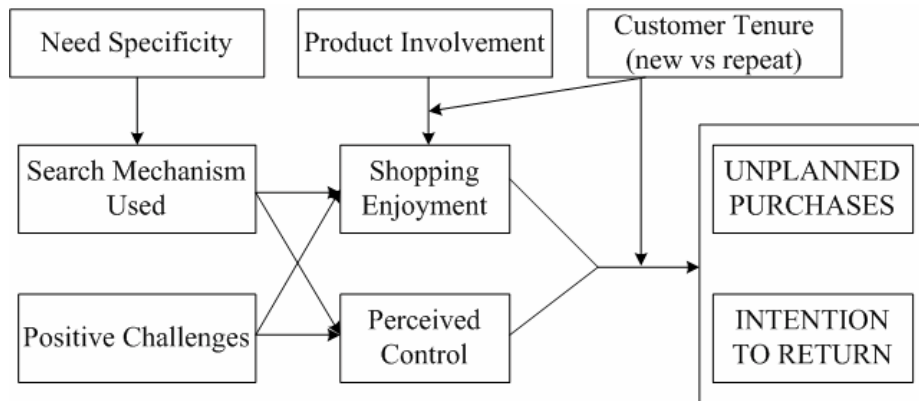
The authors found support for some of their hypotheses. In terms of the environmental

factors, the search engine used and positive challenges were found to increase shopping

enjoyment, but had no effect on perceived control. A negative relationship was found between

need specificity and the search mechanism used. In other words, the more certain a consumer is

about what he or she is looking for, the less he or she will use a search mechanism. Product

involvement was found to have a significant effect on shopping enjoyment. There were

significant differences between the shopping experience and the behavior of new and repeat

customers.

Interestingly, the authors did not find support for any of the hypotheses relating to

unplanned purchases. More specifically, there was no relationship between shopping enjoyment

or the perceived level of control and unplanned purchases. The authors attribute these results to

the fact that the online store only rented and sold movies and believe that the findings would

have been different if the online store sold a wide range of products. Moreover, the use of a field study implies limited generalizability and precision (McGrath 1982).

2.1.2.2.3 An Integrated Theoretical Framework of Online Consumer Behavior

Building on the findings in the previous study, Koufaris (2002) propose a theoretical model of online consumer behavior, which draws from research in information systems, marketing, and psychology. The dependent variables studied were unplanned purchases and intention to return (see Figure 2.8). The independent variables were product involvement, web skills, value-added search mechanisms, and challenges. The author also studied the effect of different mediating variables, namely perceived control, shopping enjoyment, and concentration. Consistent with TAM, he also tested the relationship between perceived usefulness or perceived ease of use and the intention to return. The research methodology used was an experiment where students were given a $10 gift certificate for purchase at an online book store.

Figure 2.8: A Theoretical Framework of Online Consumer Behavior

(from Koufaris 2002)
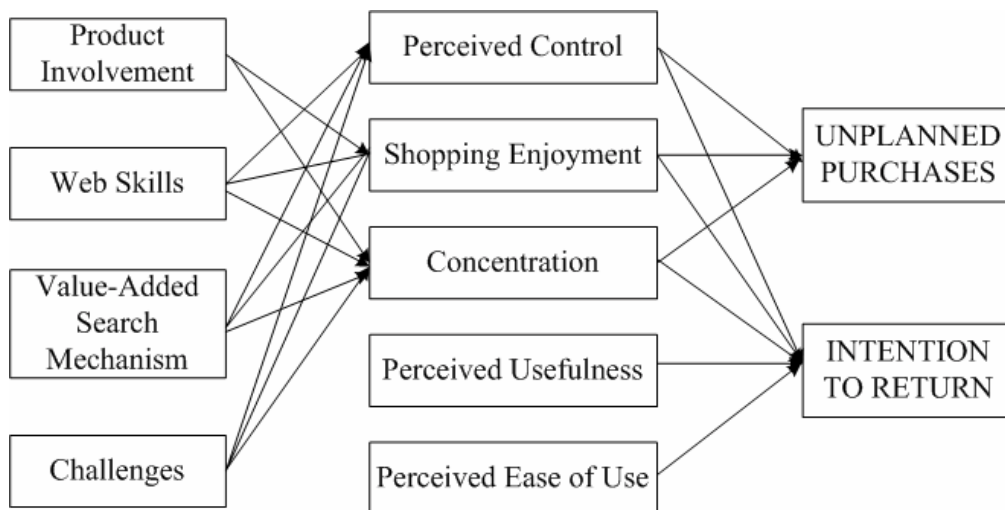
The author did not find support for all the hypotheses. Product involvement was found to have an effect on both shopping enjoyment and concentration. Both perceived web skills and challenges were found to influence shopping enjoyment and concentration, but both did not affect perceived control. Value-added search mechanism used was found to only influence shopping enjoyment, but not perceived control and concentration. Only shopping enjoyment and perceived usefulness were found to influence the intention to return, which supports the proposition that the web has both hedonic and utilitarian benefits (Van der Heijden 2004).

Interestingly, just like in the previous study, no support was found for any unplanned purchases hypotheses. The author had predicted that the level of perceived control, shopping enjoyment, and concentration will determine unplanned purchases on the Internet, but the data did not support these hypotheses. The author attributes these weak findings to the fact that it was difficult to buy a product at the website with the gift certificate.

2.1.2.2.4 The Effects of Media Format on Emotions and Behavioral Intention

Adelaar and colleagues (2003) used the environmental psychology approach to study the effects of three different media formats of web pages on impulse buying intentions for music CDs (see Figure 2.9). Three distinct media formats were studied, namely the text of the song lyrics, still images from the song's music video, and the music video itself, while simultaneously playing the soundtrack. The emotional responses studied included pleasure, arousal and dominance. The authors use an experiment to test this model and three distinct web pages were created based on the dependent variables.

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Figure 2.9: Theoretical Model for the Effects of Media Format on Behavioral Intention (from Adelaar et al. 2003)
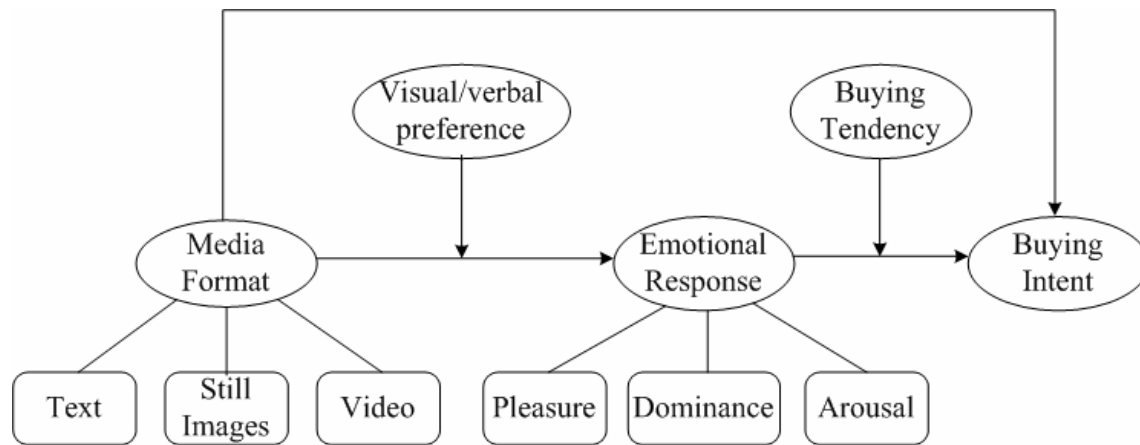
The authors found support for few of their hypotheses. Media format was found to have an influence on impulse buying intentions. More specifically, the media format that generated the highest impulsive buying intention was the lyrics of the song text in combination with playing the song. The display of a video was not found to generate positive feeling. A subject's emotional responses were found to have a significant effect on his or her impulse buying intention. These responses were also found to have a mediating effect on the relationship between media format and the consumer's impulse buying intentions. This study has serious implications for marketers, since the most simple media format led to more impulse buying, which means that textual format should be used instead of the more sophisticated options. While these findings are very interesting, they can only be generalized to music CDs purchase on the Internet.

2.1.2.2.5 Impact of Online Payment Processes on Consumer Decision Making

Dutta and colleagues (2003) studied the effect of implementation characteristics of

payment processes on recall of past expenses and future impulse buying (see Figure 2.10). The

characteristics of the payment processes studied include their usability, feedback, and rehearsal.

The usability of the payment process is the number of steps involved, the feedback option

provides interventions to inform the consumer about current spending as well as past expenses,

while the rehearsal is the situation where individuals track their expenses against mental budgets.

The authors use an experiment to validate the model in the context of a fictitious online store

selling books, music CDs, and DVDs and movies.

Figure 2.10: Impact of Online Payment Process on Consumer Decision Making

(from Dutta et al. 2003)
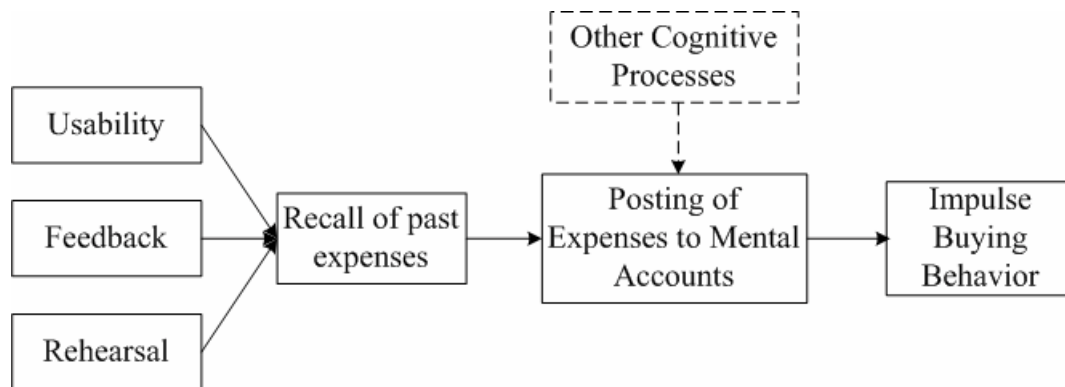
The results show that these implementation characteristics of online payment processes

impact consumers. The impact of rehearsal on recall manifested through its interactions with

feedback and usability. Higher usability of the payment processes led to greater impulse buying

when rehearsal was absent. Due to the strong interactions between usability and rehearsal,

feedback did not have a significant effect on impulse buying. These results have significance for

the design of payment systems. If the intent is to make the consumer indulge in impulse buying,

a more usable payment process should be used as the consumer is less aware of the current financial situation.

2.1.2.3 Need for Further Research

These studies provide an initial foothold in the understanding of online impulse buying. In addition, Madhavaram and Laverie (2004) provide a good conceptualization of this phenomenon. However, there is so much to be done yet to get to the same level of understanding as for impulse buying in a traditional commerce setting. These researchers identify the need for further research. A common theme emerging from these different studies is a call for research to understand the online impulsive buying behavior. For instance, Koufaris and colleagues (2001-2002) call for further research to "understand how on-line environments can be best designed to increase unplanned purchases" (p. 131). Similarly, Madhavaram and Laverie (2004) indicate that "experimental studies would greatly enhance our overall understanding of impulse buying phenomenon" in an online setting (p. 65). The current research tries to shed some light on this behavior. Next, a review of the framework used for this research is presented.

2.2 The S-O-R Framework

The stimulus-organism-response (S-O-R) framework is an important theoretical framework that has been used to study the effects of atmospherics on an individual's behavior. The main premise of this framework is that when individuals are exposed to a stimulus, they develop certain responses, which in turn dictate their behavior. The model proposed in this research draws from atmospherics or environmental psychology literature.

In the next section, the use of atmospherics literature for the study of online impulse buying is justified. Two theoretical models that are based on the S-O-R framework are then proposed. A review of each model and its applications are also provided. This section concludes with how one of these models will be extended to the study of online impulse buying.

2.2.1 Using Atmospherics to Study Impulse Buying

Atmospherics has been defined as "*the conscious designing of space to create certain buyer effects*" (Kotler 1973-1974, p. 50). In other words, it is the design of buying environments to elicit specific responses in the buyer that enhance purchase probability. In a traditional commerce setting, marketers manipulate store atmospherics to increase impulse purchases (Rook and Fisher 1995). The stimulus is presented to the consumer in an enticing way, which may trigger the impulse buying process. Consequently, research from environmental psychology has been used in the study of impulse buying in both the contexts of traditional shopping and online shopping. For instance, McGoldrick and colleagues (1999) have drawn from environmental psychology to develop a model of spontaneous buying during seasonal sales in a store. Similarly, several researchers have used this concept to study online impulse buying (e.g., Koufaris et al. 2001-2002). The S-O-R framework will be used to develop a model of online impulse buying.

2.2.2 A Review of the S-O-R Framework

Several research models have been developed based on the S-O-R framework. In this section, two of these models are reviewed. First, the S-O-R framework and the work by Mehrabian and Russell (1974) are reviewed. The next subsection provides a review of the emotional dominated model of environmental psychology which is proposed by Donovan and

Rossiter (1982). Then, the S-O-R model of consumer response to online shopping, which is an extension of the previous model to an online setting and has been proposed by Eroglu, Machleit, and Davis (2001), is presented. This section also includes a description of how the S-O-R framework will be used in the study of online impulse buying.

2.2.2.1 An Emotional Dominated Model of Environmental Psychology

Environmental psychology draws from the S-O-R paradigm, which posits that the environment is the stimulus consisting of cues that combine to affect an individual's response, which in turn determines the individual's behavior. Drawing from the S-O-R paradigm, Mehrabian and Russell (1974) developed an emotional dominated model of environmental psychology. They proposed that various stimuli in the environment cause primary emotional responses, thus causing reactions to that environment.

According to Mehrabian and Russell (1974), the environment can be characterized by the *information rate*, which is defined as the novelty and complexity of an environment. *Novelty* is defined as the unexpected, surprising, or unfamiliar aspect of the environment, while *complexity* refers to the number of elements, motions, or changes in that environment. According to their model, the more varied, novel, surprising, and animating the environment, the higher is the information rate and consequently, the more likely will the individual react to the environment.

The stimuli in the environment lead to emotional reactions, which can be categorized under three fundamental dimensions, namely pleasure, arousal, and dominance. According to Mehrabian and Russell (1974), pleasure is the situation where the individual is joyful and in a good mood; arousal is the situation where the individual is active, excited, or stimulated; while

dominance is the state where the individual feels free to act. At a later stage, Russell (1979) posited that pleasure and arousal adequately capture the range of emotional responses, and as a consequence, the dominance dimension is no longer included. These emotional reactions lead to either an approach or an avoidance behavior, where an approach behavior is a positive reaction to the environment, whereas an avoidance behavior is characterized by an aversive reaction to that environment.

Donovan and Rossiter (1982) were among the first researchers to apply this model to the study of the effects of retail atmosphere on consumers' behaviors. They operationalized the atmospheric cues of the retail store as the stimulus; the shoppers' emotional responses as the organism; and approach/avoidance behaviors as the response. In this study, they examined the effects of three different store environments on consumers' emotional states. They found that a pleasant store environment had an effect on both pleasure and arousal, which in turn determined shopping enjoyment, the time spent in the store browsing or exploring, and the willingness to talk to sales personnel.

After that initial study, several researchers have used the environmental psychology approach to study the effects of retail atmosphere on consumers' behavior. The different store atmospheric cues studied include music (Hui et al. 1997; Mattila and Wirtz 2001; Yalch and Spangenberg 1990), lighting (Golden and Zimmerman 1986), scent (Mattila and Wirtz 2001; Spangenberg et al. 1996), and color (Belizzi et al. 1996). As the repository of research on the effect of different atmospheric cues increased, researchers have also focused on developing typologies or classification schemes for these cues. For instance, Baker (1986) presented a

general typology of environmental cues which consists of social factors, such as the salesperson; design factors, such as color and layout; and ambient factors, such as scent and music. With online shopping rapidly growing into a new form of shopping, the logical extension of atmospherics research was to focus on various atmospherics aspects of this new medium. A review of a model which uses the S-O-R framework in the online context is presented next.

2.2.2.3 An S-O-R Model of Consumer Response to Online Shopping

Eroglu, Machleit, and Davis (2001) took the first step in applying research on atmospherics to the study of the online store as a virtual shopping outlet. Drawing from the study by Donovan and Rossiter (1982), they developed a model of consumer response to online shopping, proposing that online stores also create an atmosphere, which affects customers' reactions (see Figure 2.11). However, since online stores lack the tactical and olfactory cues, online retailers can only manipulate visual cues, such as colors, graphics, and layout, to influence the online consumer's behavior.

Figure 2.11: An S-O-R Model of Consumer Response to Online Shopping

(from Eroglu et al. 2001)
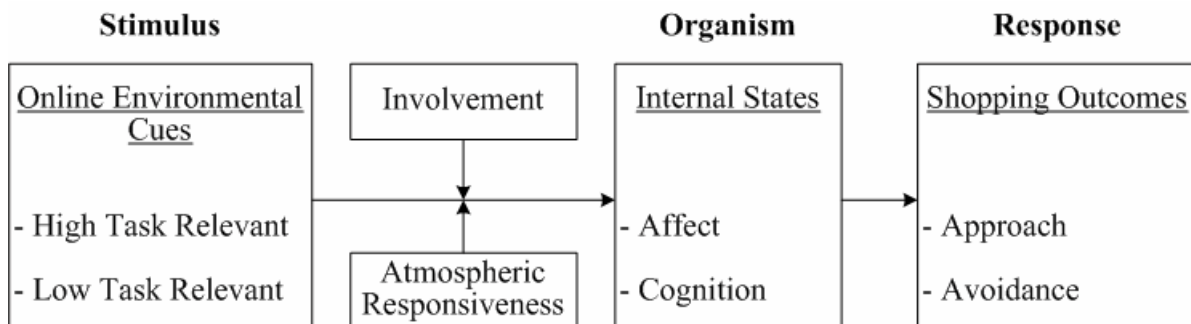
According to the model of consumer response to online shopping, online environmental cues lead to affective and cognitive states, which in turn lead to approach or avoidance behaviors. The authors also propose a typology of the online environmental cues. Using the media richness theory (Daft and Lengel 1986; Daft et al. 1987), they posit that the online store atmosphere consists of high and low task-relevant cues. *High task-relevant cues* include "all the site descriptors (verbal or pictorial) which facilitate and enable the consumer's shopping goal attainment" (Eroglu et al. 2001, p. 179-180). Examples of such cues include merchandise descriptions, price, delivery and return policies, and navigation aids. Since these cues help the online shopper to attain his or her shopping goal, these cues can be considered as being of a utilitarian nature (Babin et al. 1994). In contrast, *low task-relevant cues* refer to "the site information that is relatively inconsequential to the completion of the shopping task" (Eroglu et al. 2001, p. 180). Low task-relevant cues include colors, typestyles and fonts, animation, and music. These cues increase the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of online shopping.

The online environmental cues lead to affective and cognitive states. In accordance with Mehrabian and Russell's (1974) work, the *affective state* can be categorized along the pleasure, arousal, and dominance (PAD) dimension. However, since the PAD dimension has been criticized for its limited scope in capturing the whole range of emotions, Eroglu and colleagues (2001) suggest that researchers should use a more comprehensive set of emotions. The *cognitive state* refers to "everything that goes in the consumers' minds concerning the acquisition, processing, retention, and retrieval of information" (Eroglu et al. 2001, p. 181). This state can be

conceptualized along several dimensions, including attitudes, beliefs, attention, comprehension, memory, and knowledge. The affective and cognitive states lead to either an approach behavior, which is a positive behavior to the online environment, such as the intention to browse the website, or an avoidance behavior, which is an aversive reaction to the online environment.

In addition, the authors propose that the relationship between the environmental cues of the online store and the consumer's reactive states are moderated by involvement and atmospheric responsiveness. *Involvement* refers to the "degree of personal relevance, which is a function of the extent to which the online shopping activity is perceived to achieve the consumer's goals" (Eroglu et al. 2001, p. 181). *Atmospheric responsiveness* is defined as "the extent to which environmental characteristics influence consumers' decisions on where and how to shop and how much time to spend shopping" (Eroglu et al. 2001, p. 181).

Eroglu and colleagues (2003) provided a partial validation of the model of consumer response to online shopping in the context of a fictitious website selling high-quality shirts. They manipulated two factors, namely the atmospheric cues (high task-relevant cues or both high and low task-relevant cues) and involvement (low or high). The goal of the study was to examine the effects of atmospheric cues on emotion and attitude, the effects of emotion and attitude on satisfaction and approach/avoidance behavior, and the moderating role of involvement and atmospheric responsiveness on the relationship between online atmospheric cues and internal states.

The proposed hypotheses were supported by the data. The major finding was that online store atmosphere does make a difference. The atmospheric cues of the online store were found to

influence the emotions experienced by the online consumer and this relationship was moderated by involvement and atmospheric responsiveness. Moreover, emotion was found to mediate the influence of atmospheric cues on attitude, satisfaction, and approach/avoidance behaviors. As expected, involvement and atmospheric responsiveness moderated the relationship between online atmospheric cues and internal states.

2.2.3 Using the S-O-R Framework to Study Online Impulse Buying

Several researchers have used the S-O-R framework to study online impulse buying (e.g., Koufaris et al. 2001-2002). This research also draws from this paradigm, more specifically on the model of consumer response to online shopping proposed by Eroglu and colleagues (2001). The proposed categorization of environmental cues will be used to identify interface characteristics within each category which are crucial in online impulse buying. The effect of these interface characteristics on affective and cognitive states and the subsequent influence of these states on impulse buying will also be explored.

2.3 The Technology Acceptance Model

Davis (1989) introduced an adaptation of Fishbein and Ajzen (1975), called the technology acceptance model (TAM), which is specifically tailored for modeling user acceptance of information systems. In the information systems literature, this model has been applied and extended in a variety of ways. In the next section, a brief review of this model is provided. The following section focuses on one extension of TAM, which has been proposed by Van der Heijden (2004) and which is of interest to this research.

2.3.1 A Brief Review of the Technology Acceptance Model

The basis of TAM is that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for information systems adoption behaviors (see Figure 2.12). Perceived usefulness is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context. Perceived ease of use refers to the degree to which the prospective user expects the target system to be free of effort. Actual usage behavior of the system is determined by behavioral intention, which is jointly determined by the individual's attitude toward using the system and the system's perceived usefulness. According to TAM, the attitude toward using the system is jointly determined by the perceived usefulness and the perceived ease of use of the system. Finally, the perceived ease of use is posited to have a direct effect on perceived usefulness. Earlier versions of TAM identified the attitude toward using the system to be important in the prediction of actual system usage (e.g., Taylor and Todd 1995). However, at a later stage, it was found that attitude intervened between the beliefs and behavioral intention far less than hypothesized and thus, was dropped from the model (Venkatesh and Davis 1996). TAM, therefore, assumes that behavioral intention is the major determinant of usage behavior and that any other factors that may influence usage behavior do so indirectly through their influence on behavioral intention.

The strength of TAM is that it provides an explanation of the determinants of system acceptance which influence user behavior across a broad range of end-user computing

technologies and user populations, while at the same time being both parsimonious and theoretically justified.

Figure 2.12: The Technology Acceptance Model
(from Davis 1989)
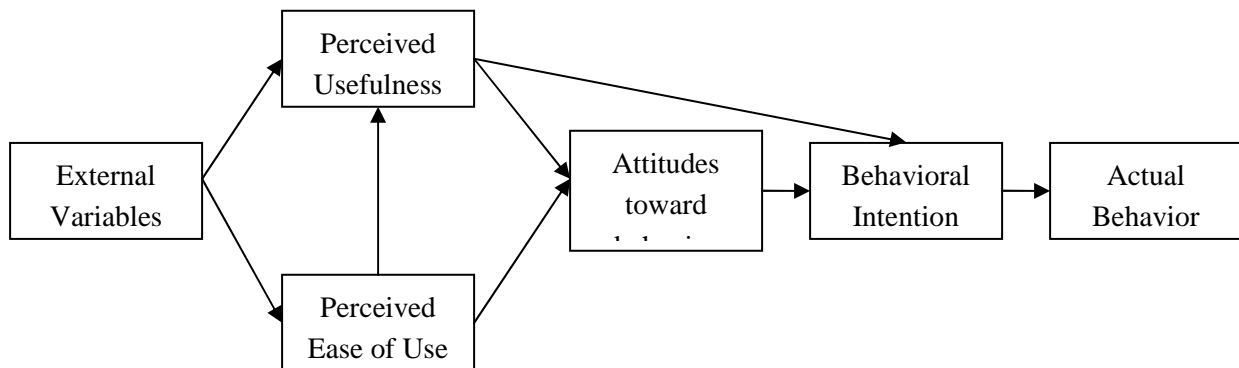
Since the study by Davis (1989), multiple studies have been conducted using the TAM model and these studies can be categorized in two broad areas. First, TAM has received substantial empirical validation in a wide variety of work contexts and environments (e.g., Chau and Hu 2002; Gefen et al. 2003; Pavlou 2001; Venkatesh and Davis 2000). Second, researchers have extended TAM to include more variables. Some examples of the studied variables include computer self-efficacy (Venkatesh and Davis 1996), emotion (Venkatesh 2000), gender differences (Venkatesh and Morris 2000), individual differences (Agarwal and Prasad 1999), risk (Pavlou 2001), and trust (Gefen et al. 2003; Pavlou 2001). A study that has extended TAM is of particular interest to the current research and a review is provided in the next section.

2.3.2 User Acceptance of Utilitarian and Hedonic Information Systems

In the body of literature reviewed above, a central tenet across these studies is that perceived usefulness is a stronger determinant of actual usage than perceived ease of use (Taylor

and Todd 1995; Venkatesh and Davis 2000) since only systems of a utilitarian nature have been studied. However, there is now an emerging class of new systems, such as the web, that serve both utilitarian and hedonic benefits. For these new systems, perceived usefulness alone no longer explains acceptance. Therefore, there has been a need to further expand the boundaries of TAM by including a new belief set to explain the acceptance of the hedonic component of these systems. Davis and colleagues (1992) integrated a new concept, perceived enjoyment, in TAM and defined it as the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated. The authors found support for the proposition that the relationship between perceived ease of use and actual usage is fully mediated by perceived usefulness and perceived enjoyment. A few other researchers have tested the concept of perceived enjoyment in TAM and have found support for the relationship between perceived enjoyment and usage (Atkinson and Kydd 1997; Igbaria et al. 1995; Teo et al. 1999) and the mediating effect of perceived enjoyment on the relationship between perceived ease of use and usage (Igbaria et al. 1995; Teo et al. 1999).

Van der Heijden (2004) builds on this body of knowledge to study the differences in user acceptance models for productivity-oriented (or utilitarian) and pleasure-oriented (or hedonic) information systems (see Figure 2.13). The author tests the proposition that what shapes intentions to use is dependent on the utilitarian or hedonic nature in the context of the web, which supports both utilitarian and hedonic purposes. The interface used for the study was a Dutch movie website and a cross-sectional survey design was employed. The data provided support for the proposition.

Figure 2.13: User Acceptance of Hedonic and Utilitarian Information Systems
(from Van der Heijden 2004)
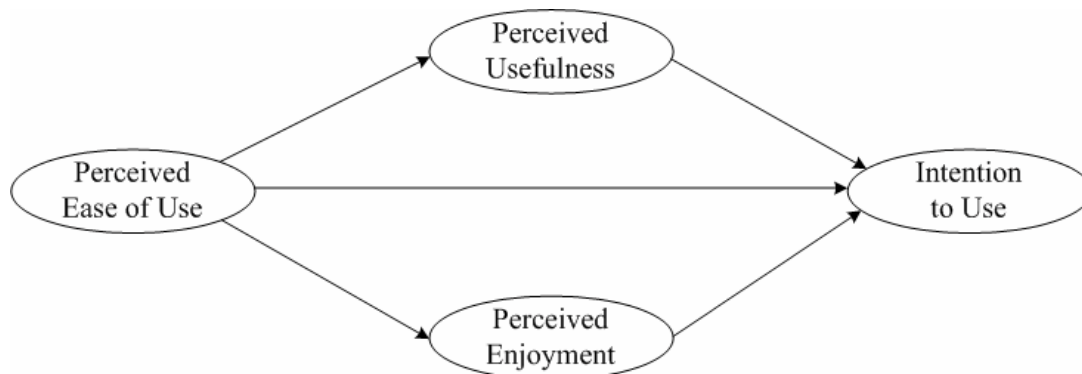
Perceived enjoyment and perceived ease of use were stronger determinants of intention to use a hedonic information system than perceived usefulness. Another important finding in this study was the important contribution of ease of use in the acceptance of utilitarian and hedonic information systems. In the case of utilitarian information systems, ease of use assists usefulness to increase the utilitarian value of the system. Moreover, in the acceptance of hedonic information systems, ease of use assists enjoyment to increase the hedonic value of the system.

2.4 Summary

This research specifically focuses on the interesting phenomenon of impulse buying in an online context, which will be studied using a multi-disciplinary approach. This chapter reviewed the relevant literature drawn from an extensive body of knowledge from information systems, consumer behavior, and environmental psychology. This review of literature provides a strong foundation for developing a comprehensive research framework to address the proposed research questions.

The consumer behavior and psychology literature provided a foundation for understanding impulse buying and the reasons why individuals engage in such a behavior. The consumer behavior literature also provides a list of the different factors that enhance impulse buying. From the information systems literature, an extension of the technology acceptance model was reviewed, which will prove to be useful in developing the proposed model in an online context. A review of information systems literature also revealed the need for further research to understand online impulse buying. Finally, the environmental psychology literature provided the most appropriate theoretical framework for studying online impulse buying.

Based on this literature review in this chapter, the following chapter outlines the research framework which was developed to examine the phenomenon of online impulse buying. Specific hypotheses are formulated to empirically test the proposed model.

CHAPTER 3

RESEARCH MODEL AND HYPOTHESES

Building upon the body of literature reviewed in the previous chapter, this chapter outlines a research model that provides the foundation for studying impulse buying behavior in an electronic commerce (e-commerce) setting. The research model leverages the S-O-R framework as a meta-framework to examine the impulse buying behavior of online consumers. This chapter consists of two sections. The first section builds the proposed framework based on the relevant literature from the previous chapter. In the next section, specific hypotheses are derived to empirically test the proposed theoretical model.

3.1 Research Model

Impulse buying is a *reactive* behavior, in that the consumer shows certain responses when exposed to the stimulus in the purchase situation (Weinberg and Gottwald 1982). The stimulus can be considered as the catalyst in the impulse buying process. Consequently, research from environmental psychology can be used in the study of impulse buying. As indicated in the previous chapter, the S-O-R framework drawn from environmental psychology provides a useful meta-framework for investigating the online impulse buying phenomenon. The main premise of this framework is that when exposed to a stimulus, individuals develop certain responses, which in turn dictate their behavior. Three factors are important in this framework, namely the stimulus, the organism, and the response. To explore online impulse buying using the S-O-R framework's tenet, these factors must be adapted to an electronic commerce context. Therefore, it is proposed that in the context of online impulse buying, the web interface is the stimulus, the online

consumer's emotional and cognitive states are the organism, and the response is the approach/avoidance behavior that leads to online impulse buying.

The research model, which provides a foundation for studying the impulse buying phenomenon in an online setting, is presented in Figure 3.1. Based on a review of the relevant literature, the model posits that various environmental cues within the web interface will cause the online consumer to experience certain emotional and cognitive responses leading to approach/avoidance behaviors, which in turn will influence the impulse buying behavior. Each of the following subsections provides a detailed account of the stimulus, the organism, and the response integrated within the research model.

Figure 3.1: The Research Model
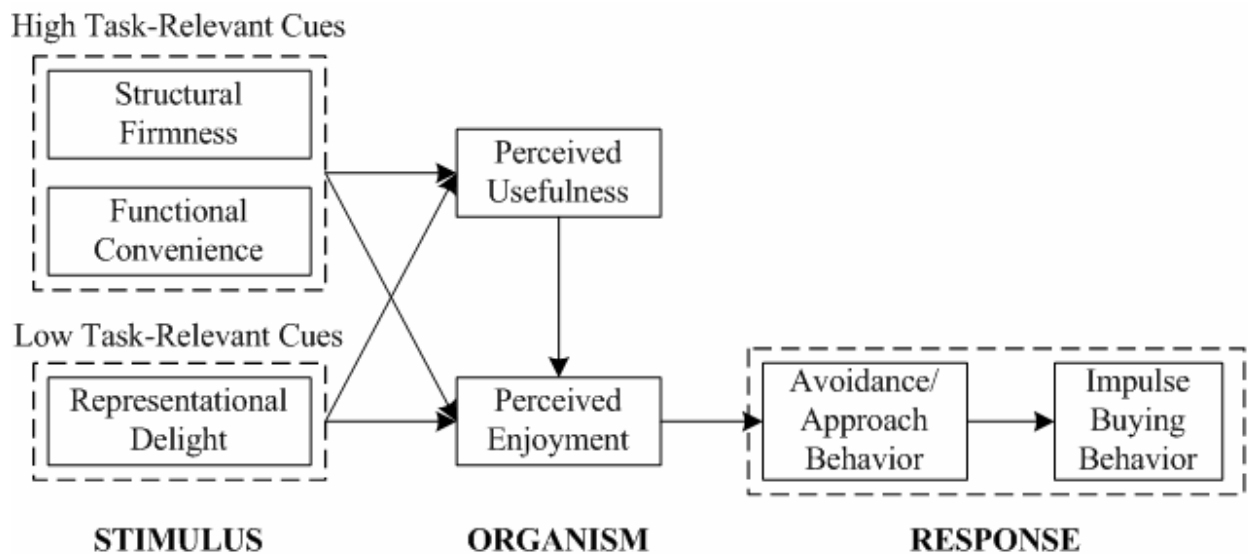
3.1.1 The Stimulus

The web interface is considered as the stimulus. According to the model of online atmospherics, the environmental cues from the web interface combine to create the online atmosphere (Eroglu et al. 2001). The first step in the theory development process involves

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identifying the different interface characteristics which are crucial in the online impulse buying and classifying them as low or high task-relevant cues as proposed by Eroglu et al. (2001).

In parallel to the phenomenal growth in e-commerce over the last years, there has been a surge in academic research related to understanding e-commerce (ISR Special Issues 2002). Such research efforts have produced a number of important and interesting insights, most notably a comprehensive list of e-commerce interface characteristics that help organizations understand and predict online consumer behavior. An important contribution within this body of knowledge has been the work by Kim and colleagues (2002).

Drawing from the architecture literature, they propose three macro-categories of web characteristics that can be used to evaluate Internet businesses in the "same systematic and rigorous manner as buildings" (Kim et al. 2002, p. 241). These macro-categories include functional convenience, representational delight, and structural firmness. These categories are attractive for at least two reasons. First, they are parsimonious, making it easy to compare and contrast how they differ across different interfaces. Second, they are comprehensive and inclusive, making it easy to map specific interface characteristics to these respective categories. Therefore, these macro-categories are used for this research.

The next step involves sorting these sets of web characteristics into the categories proposed by Eroglu and colleagues (2001). Based on the media richness theory (Daft and Lengel 1986; Daft et al. 1987), they propose that the online store atmosphere consists of high and low task-relevant cues. In the next subsections, the justification for this categorization is provided. A pilot study was also conducted to provide empirical evidence for this categorization. A review of

this study and the observed results are provided in Appendix B. In the next subsections, reference will be made to the results of this pilot study to provide empirical evidence for the categorization of functional convenience, representational delight, and structural firmness as low and high task-relevant cues.

3.1.1.1 High Task-Relevant Cues

High task-relevant cues include the web features that facilitate and enable the consumer's shopping goal attainment (Eroglu et al. 2001). It is proposed that structural firmness and functional convenience are high task-relevant cues and justification for this proposition is provided next.

3.1.1.1.1 Structural Firmness

Structural firmness has been defined as "the solidity of the system structure in overcoming all expected and unexpected threats" (Kim et al. 2002, p. 241). It relates to the security and stability associated with the web interface. This macro-category consists of interface characteristics, such as system performance and system security. Table 3.1 contains a list of the different characteristics within this macro-category and also, the different studies where the effects of these characteristics on web usage have been explored. A brief review of the findings is presented next.

The characteristics within structural firmness determine which websites online users return to and which sites they make purchases on. The Internet provides a useful medium for the exchange of information and therefore, an open architecture is promoted to allow this information exchange (Pavlou 2001). However, this openness also makes the Internet vulnerable

to security breaches (Vijayasarathy 2004). Consumers feel they have no control over the payment information provided at an e-commerce site. *Security* perceptions have been found to be an important determinant of a consumer's intention to make a transaction at an e-commerce site (Pavlou 2001). In fact, security can be considered to be a top, if not the top, priority for web users, particularly for e-commerce domains (Zhang and Von Dran 2001-2002).

Table 3.1: Structural Firmness and Representative Characteristics

Characteristics	Source
Protection of consumer's information	Chakraborty et al. 2003; Kim et al. 2002; Korgaonkar and Wolin 1999; Miyazaki and Fernandez 2001; Panurach 1996; Pavlou 2001; Phelps et al. 2001; Swaminathan et al. 1999; Vijayasarathy 2004; Wolfinbarger and Gilly 2003; Youn and Faber 2000; Zeithaml et al. 2002
Quick error recovery	Bhimani 1996; Kim et al. 2002
Risk perceptions	Bhatnagar et al. 2000; Featherman 2001; Pavlou 2001
System performance	Bhimani 1996; Liang and Huang 1998; McKinney et al. 2002
System reliability	Devaraj et al. 2002; McKinney et al. 2002; Novak et al. 2000; Swaminathan et al. 1999; Zeithaml et al. 2002
System security	Aladwani and Palvia 2002; Chakraborty et al. 2003; Hoffman et al. 1999; Kim et al. 2002; Korgaonkar and Wolin 1999 ; Miyazaki and Fernandez 2001; Novak et al. 2000; Panurach 1996; Pavlou 2001; Ranganathan and Ganapathy 2002; Salisbury et al. 2001; Swaminathan et al. 1999; Szymanski and Hise 2000; Vijayasarathy 2004; Wolfinbarger and Gilly 2003; Yoo and Donthu 2001; Youn and Faber 2000; Zhang and Von Dran 2001-2002; Zhu and Kraemer 2002
Response time	Bhimani 1996; Kim and Stoel 2004; Kim et al. 2002; Lin and Lu 2000; Liu and Arnett 2000; Loiacono et al. 2002; McKinney et al. 2002; Palmer 2002; Ranganathan and Ganapathy 2002; Rose et al. 1999; Rose and Straub 2001; Schneiderman 1998; Yoo and Donthu 2001

Similarly, online consumers are faced with *privacy* concerns as they feel that they have less and less control over their private information (Chakraborty et al. 2003). When shopping online, consumers have to give away information about themselves which can be used unscrupulously if it falls in the wrong hands. Consequently, these consumers decide not to purchase at websites where they think their privacy is not protected (Chakraborty et al. 2003). In

addition to the risks associated with the interface's security and privacy, the consumer faces *risks* related to the product category (Bhatnagar et al. 2000). For certain products, such as CDs or software, the Internet seems to be the most convenient medium for purchase. However, for products such as clothing or sunglasses, the consumer faces higher risks, given that he or she cannot try or touch and feel the product.

Marketers can use graphics or audio and video links to convey information about products, but these usually slow down the access to particular pages within the web site (Geissier et al. 2001). Web users are more demanding and are unwilling to wait for more than a few seconds for a response from a website (Schneiderman 1998). Firms have little or no control over the technology through which the consumer accesses the firm's web site (Rose et al. 2003), and including large image, video, and sound files has a detrimental effect on customer satisfaction (Davis and Hantula 2001), which can only hurt these firms. Indeed, there have been reports of many incidents when long waiting times have resulted in user frustration, lost sales, and negative publicity (Chakraborty et al. 2003). Therefore, *download delay* is an important characteristic that reflects the quality of an e-commerce interface (Palmer 2002) and thus, determines what sites web users browse or use.

System *performance* relates to the system's ability to meet the web users' needs (Cadotte et al. 1987) and is an important determinant in the satisfaction derived from using or interacting with the system (Churchill and Surprenant 1982). Related to the performance of a system is its *reliability*. The interface should provide the same level of service at any time. The inability to access a website at any one time can cause frustration, which can have detrimental effect on sales

and the company's image (Chakraborty et al. 2003). Moreover, any data being transmitted during a transaction should not be tampered with in any way (Bhimani 1996). In any situations where there are disruptions in the service, there should be *quick recovery* to avoid any potentially serious consequences to the company's image.

The above studies provide evidence that the characteristics or features within structural firmness are very important determinants of which websites users choose to browse or make purchases at. The web consumers surveyed also indicated that characteristics related to structural firmness were most critical, and that they would not visit a website that did not provide acceptable structural firmness (see Appendix B for a review of the study). Since the features of structural firmness are very important in helping the online consumer reach his or her shopping goal, structural firmness is classified in the high task-relevant category.

3.1.1.1.2 Functional Convenience

Functional convenience refers to "the provision of convenient functions for customer processing of transaction activities" (Kim et al. 2002, p. 241). These convenient features are important both at the information gathering and the order processing phases. This macro-category consists of interface characteristics, such as ease of use and ease of navigation. Table 3.2 contains a list of the different characteristics within this macro-category and also, several studies where the effects of these characteristics on web usage have been explored. A brief review of the findings is presented next.

In the context of e-commerce, the web interface or the online store can be considered a technology or system, while the online consumer can be considered as a system user (Koufaris

2002). Consequently, the technology acceptance model (TAM) can be used to explain the acceptance or usage of this system. In this body of literature, *ease of use* is an important determinant of an individual's intention to use a system (e.g., Davis 1989). Perceived ease of use refers to the degree to which the prospective user expects the target system to be free of effort (Davis 1989; Davis et al. 1989). Several researchers have tested and found support for the relationship between perceived ease of use and the intention to use a system in the context of e-commerce (e.g., Koufaris 2002; Pavlou 2001; Van der Heijden 2004; Vijayasarathy 2004).

Table 3.2: Functional Convenience and Representative Characteristics

Characteristics	Source
Ease of navigation	Childers et al. 2001; Danielson 2002; Kim and Stoel 2004; Loiacono et al. 2002; Palmer 2002; Salisbury et al. 2001; Shim et al. 2002; Szymanski and Hise 2000; Zhang and Von Dran 2001-2002
Ease of understanding	Chakraborty et al. 2003; Kim and Stoel 2004; Loiacono et al. 2002
Ease of use	Agarwal and Venkatesh 2002; Chakraborty et al. 2003; Chen and Hitt 2002; Featherman 2001; Koufaris 2002; Koufaris et al. 2001-2002; Loiacono et al. 2002; Pavlou 2001; Shim et al. 2002; Vijayasarathy 2004; Yoo and Donthu 2001
Functional fit-to-task	Kim and Stoel 2004; Loiacono et al. 2002
Information availability	Chakraborty et al. 2003; Palmer 2002; Shim et al. 2002; Zhang and Von Dran 2001-2002
Information quality	Agarwal and Venkatesh 2002; Aladwani and Palvia 2002; Lin and Lu 2000; Liu and Arnett 2000; Loiacono et al. 2002; Palmer 2002; Ranganathan and Ganapathy 2002; Szymanski and Hise 2000
Interactivity	Chakraborty et al. 2003; Palmer 2002
Personalization	Agarwal and Venkatesh 2002; Chakraborty et al. 2003; Chen and Hitt 2002; Kim and Stoel 2004
Price competitiveness	Novak et al. 2000 ; Shim et al. 2002; Swaminathan et al. 1999
Product assortment	Torkzadeh and Dhillon 2002; Szymanski and Hise 2000
Responsiveness	Agarwal and Venkatesh 2002; Palmer 2002; Shim et al. 2002; Torkzadeh and Dhillon 2002; Yoo and Donthu 2001; Zeithaml et al. 2002; Zhang and Von Dran 2001-2002

The *functional fit-to-task* of the website as a shopping medium relates to the extent to which consumers believe that their shopping productivity will be increased by using the

particular website (Koufaris 2002). Another set of beliefs that has been used to study the

acceptance of the web as a system is the *ease of navigation*. It relates closely to the concept of

ease of use, since it is the extent to which navigating a website is perceived to be free of effort

(Salisbury et al. 2001). Navigability has been found to be crucial in determining which websites

individuals normally visit (Nielsen 2000), and which ones they commit to (Bauer et al. 2002).

Navigability relates to the sequencing of the pages, layout consistency, and the consistency of

navigation protocols (Palmer 2002). A website that is well organized and, therefore, easy to

navigate will be perceived as being less complex and more easy to use (Chakraborty et al. 2003).

According to the media richness theory, it is imperative that the information exchanged

across a medium is of good quality, accurate, and reliable (Daft and Lengel 1986; Daft et al.

1987). In an online setting, the consumer cannot experience the product of interest as he or she

would in a traditional commerce setting, such as a brick-and-mortar retail store. Therefore,

marketers need to provide intensive information about the product to address this limitation. This

entails the *availability* of *high-quality* information based on which the consumer can make

shopping decisions (Palmer 2002). The information should also be presented in the simplest way,

not in technical terms, whenever applicable so that the online user can *easily understand* the

information presented. Information completeness, comprehensiveness, and quality have been

found to be important facilitators of the shopping process (Shapiro and Varian 1999).

The web as a communication medium is very unique as compared to other media, such as

television and radio, because of its interactive nature (Coviello et al. 2001). A website's

interactivity relates to both its ability to allow the consumer to customize its look, feel, and

content (personalization), as well as the provision of interaction with the user (responsiveness) (Palmer 2002). *Personalization* allows the visitor to control the type of information he or she wants to view (Chakraborty et al. 2003). This feature thus keeps out unwanted information or products, reduces the effort needed to filter unwanted information, improves the accuracy of searches, and increases the ease and speed of making a transaction (Chakraborty et al. 2003). *Responsiveness* is important in the context of online shopping (Jarvenpaa and Todd 1997), and relates to the availability of feedback to the users as well response from the site managers (Palmer 2002).

Online merchandising, which includes the product offerings, has also been considered as an advantage of online shopping (Szymanski and Hise 2000). In an online setting, consumers are presented with a vast *assortment of products*, from which to choose. Moreover, the cost of finding one particular product on the web is relatively inconsequential as compared to the same search in a brick-and-mortar store. Moreover, it is very easy and quick to make *price comparisons* on the Internet. Such price comparisons enhance competition among the online vendors, which can be beneficial to the consumer.

The above review provides evidence that the features within functional convenience are important in determining which websites individuals use. The web consumers surveyed also indicated that characteristics related to functional convenience were important, but secondary to those of structural firmness (see Appendix B for a review of the study). Thus, given two websites with equal products/services as well as equal structural firmness, consumers would respond more positively to the site with stronger functional convenience. Since the features of functional

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convenience are important in helping the online consumer reach his or her shopping goal, functional convenience is classified in the high task-relevant category. Indeed, the availability of navigation aids, which can be considered to enhance functional convenience, has been considered as an example of a high task-relevant cue (Eroglu et al. 2001; Eroglu et al. 2003).

3.1.1.2 Low Task-Relevant Cues

Low task-relevant cues refer to "the site information that is relatively inconsequential to the completion of the shopping task" (Eroglu et al. 2001, p. 180). These cues do not directly impact the achievement of the shopping goal of the online consumer (Eroglu et al. 2001). Representational delight is considered as being low task-relevant and in the next subsection, justification for this proposition is provided.

3.1.1.2.1 Representation Delight

Representational delight refers to the "interface aspects of the Web site with which the user comes into contact" (Kim et al. 2002, p. 242). It includes both what the users see and hear when interacting with the website. Representational delight consists of interface characteristics, such as visual appeal and the inclusion of graphics. Table 3.3 contains a list of the different characteristics within this macro-category and also, several studies where the effects of these characteristics have been explored. A brief review of the findings is presented next.

Similar to their offline counterparts, online stores can be designed to elicit specific responses in the buyer that enhance purchase probability (Eroglu et al. 2001). Visual appeal relates to the presence of visual elements, such as colors, which enhance the overall look of the website (Van der Heijden et al. 2003). The use of multi-media, such as 3D images, animations,

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and audio or video streaming, also enhances the visual attractiveness of a website (Shim et al. 2002). Visual appeal plays an important role in the decision to use a website, through its influence on the enjoyment (Van der Heijden et al. 2003).

Table 3.3: Representational Delight and Representative Characteristics

Characteristics	Source
Emotional appeal	Agarwal and Venkatesh 2002; Kim and Stoel 2004
Entertainment value	Chen and Hitt 2002; Koufaris 2002; Koufaris et al. 2001-2002; Liu and Arnett 2000; Zhang and Von Dran 2001-2002
Flow	Agarwal and Venkatesh 2002; Kim et al. 2002; Koufaris 2002; Koufaris et al. 2001-2002; Loiacono et al. 2002
Innovativeness	Kim and Stoel 2004; Loiacono et al. 2002
Visual appeal	Aladwani and Palvia 2002; Eroglu et al. 2001; Eroglu et al. 2003; Fink and Laupase 2000; Kim et al. 2002; Kim and Stoel 2004; Loiacono et al. 2002; Van der Heijden et al. 2003; Zhang and Von Dran 2001-2002

Web users visit websites not only out of necessity or for information, but also for *entertainment* (Huang 2003). The web is therefore considered to provide both utilitarian and hedonic benefits (Van der Heijden 2004). Websites that provide these hedonic benefits, or hedonic websites, are experiential, entertaining, and gratifying to the senses (Van der Heijden 2004). Web users browse these websites for their ability to optimize the amount of fun, playfulness, or pleasure experienced (Kempf 1999). Browsing a website for entertainment is viewed as a form of recreation (Babin et al. 1994). The investment of time in this activity is desired to extend the enjoyment being derived (Mathwick et al. 2001).

The notion of *flow* has been defined as an optimal and enjoyable experience (Csikszentmihalyi 1975). In the context of the web environment, it refers a situation when interacting with the interface which is "characterized by a seamless sequence of responses" from the website, "intrinsically enjoyable", and "accompanied by a loss of self-consciousness"

(Hoffman and Novak 1996, p. 57). In other words, it represents the web user's perceptions that interacting with the website is playful and exploratory. The Internet is unique in its interactivity when compared to other types of media, such as television or radio. This interactivity provides a unique environment, which allows users to experience flow. It has been found that the consideration of flow is crucial in understanding how users enjoy the online experience (Koufaris 2002).

The *emotional appeal* of a website causes the web user to experience emotional reactions (Agarwal and Venkatesh 2002). In environmental psychology, the emotional responses experienced determine whether an individual will engage in an approach or avoidance behavior (Mehrabian and Russell 1974). Similarly, in the context of technology acceptance, affective responses have been found to be an important determinant in explaining the acceptance of computer systems (e.g., Venkatesh 2000). When browsing a website which is emotionally appealing, the user becomes very engaged and spends more time on the website (Venkatesh 2000).

Innovativeness relates to the creativity and uniqueness of a website, which makes it very different from any other websites (Loiacono et al. 2002). Through the provision of cutting edge information technology, an innovative website can provide some form of novel experience that users find unexpected, surprising, new, and unfamiliar (Huang 2003). When interacting with the website, the consumer's interest is aroused. According to Berlyne's optimal arousal theory (1971), a moderate level of arousal is desirable to keep the web user engaged. Consequently, the user spends more time on the website experiencing the novel feature. These novel features

include multimedia modalities and the "stimulation of humanlike characteristics" (Huang 2003, p. 427).

The above review provides evidence that the features within representational delight do not directly help in the attainment of the consumer's shopping goal, but rather help in enhancing the emotional aspect of the website. Consequently, representational delight is relatively less important than both structural firmness and functional convenience when it comes to the consumer's shopping goal attainment. The web consumers surveyed also rated representational delight as being least important in helping the consumer attain his or her goal (see Appendix B for a review of the study). They indicated that although characteristics that enhance the interface's emotional aspect were important, they were relatively less important than functional convenience and relatively much less important than structural firmness. Since the features of representational delight are inconsequential in helping the online consumer reach his or her shopping goal, representational delight is classified in the low task-relevant category.

3.1.2 The Organism

In an online context, the organism is represented by the online consumer's emotional and cognitive states. In the next subsection, the different dimensions that have been used to represent emotional and cognitive states in environmental psychology literature are reviewed. Next, the dimensions that will be used for the present research are proposed.

3.1.2.1 Affective and Cognitive States Used in Environmental Psychology

According to the S-O-R model of consumer response to online shopping, environmental cues of the interface lead to affective and cognitive states (Eroglu et al. 2001). *Cognitive states*

refer to "everything that goes in the consumers' minds concerning the acquisition, processing, retention, and retrieval of information" (Eroglu et al. 2001, p. 181). This reactive state can be conceptualized along several dimensions, which include attitudes, beliefs, attention, comprehension, memory, and knowledge. For instance, Eroglu and colleagues (2003) use attitude in a study where they test the effect of environmental cues on shopping behaviors.

In accordance with Mehrabian and Russell's (1974) work, the *affective state* can be categorized along the pleasure, arousal, and dominance (PAD) dimension. However, Russell (1979) posited that only pleasure and arousal adequately capture the range of emotional responses, and as a consequence, the dominance dimension is no longer included. While the resulting PAD measure (i.e., excluding the dominance dimension) is parsimonious and easy to use, it is still criticized for not fully capturing the gamut of possible emotional reactions (Eroglu et al. 2001; Machleit and Eroglu 2000). Consequently, it has been suggested that researchers should use a more comprehensive set of emotions (Eroglu et al. 2001). Moreover, Eroglu and colleagues (2001) suggest that researchers should use internal states that are "hypothesized to be relevant in their specific research context" (p. 181). Therefore, for the present research, two sets of beliefs that are common in the information systems literature are used. A review of these belief sets is provided next.

3.1.2.2 Proposed Affective and Cognitive States

In the context of e-commerce, the web interface or the online store can be considered as a technology or system, while the online consumer can be considered as a system user (Koufaris 2002). Consequently, TAM can be used to explain the acceptance or usage of this system. Web

users visit websites not only out of necessity or for information, but also for entertainment (Huang 2003). The web therefore provides both utilitarian and hedonic benefits (Van der Heijden 2004). When studying the acceptance of the web as a system, researchers have used two set of beliefs, namely perceived usefulness and perceived enjoyment (e.g. Van der Heijden 2004). These two sets of beliefs will be used in this study, as they are more conducive to the information systems research. This is in line with the recommendation by Eroglu and colleagues (2001), who suggested that researchers should use internal states that are relevant in their specific research context. Next, a review of each of these two sets of beliefs is provided.

3.1.2.2.1 Perceived Usefulness

According to Eroglu and colleagues (2001), cognitive states experienced can be conceptualized along several dimensions, which include attitudes, beliefs, attention, comprehension, memory, and knowledge. In the information systems domain, two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for information systems adoption behaviors (Davis 1989). However, there is evidence that perceived usefulness is a stronger determinant of user acceptance than ease of use (e.g., Taylor and Todd 1995; Venkatesh and Davis 2000). Therefore, in this research, perceived usefulness is used to capture the cognitive states experienced when the online consumer interacts with the web interface.

In the context of information systems adoption, perceived usefulness has been defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context (Davis 1989). This definition has been appropriated to the context of e-commerce. The usefulness of the website as a shopping

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medium relates to the extent to which consumers believe that their shopping productivity will be increased by using the particular website (Koufaris 2002). In other words, it is the user's beliefs that using the Internet as a shopping medium will allow him or her to search for and compare products, get information and a lower price, and thus, benefit more from the transaction (Alba et al. 1997). The definition of perceived usefulness in the context of online shopping implies that online shopping is a goal-oriented activity (Shang et al. 2005).

Indeed, perceived usefulness has been found to be an important determinant in predicting web use for utilitarian purposes (Van der Heijden 2004). Web users visit certain websites out of necessity to find a solution to a problem (Park and Moon 2003). In such cases, the goal of the online consumer is the achievement of the goal in an efficient and timely manner (Mathwick et al. 2001). Because of the utilitarian nature of the task, the consumer will assess these sites visited based on their usefulness and support for solving the problem at hand (Van der Heijden 2003).

Several researchers have studied the effect of perceived usefulness in predicting web acceptance and usage. It has been found that this measure influences the attitude towards online shopping (Shih 2004; Van der Heijden and Verhagen 2004; Vijayasarathy 2004), attitude toward using a website (Sanchéz-Franco and Roldán 2005; Van der Heijden 2003), intention to purchase online (Gefen et al. 2003; Van der Heijden et al. 2003; Van der Heijden and Verhagen 2004; Vijayasarathy 2004), intention to return to a website (Koufaris 2002), intention to use a website (Sanchéz-Franco and Roldán 2005; Van der Heijden 2003; Van der Heijden 2004), and online shopping behavior (Shang et al. 2005).

3.1.2.2.2 Perceived Enjoyment

There is now an emerging class of new systems, such as the web, that serve both utilitarian and hedonic benefits (Van der Heijden 2004). For these new systems, perceived usefulness alone no longer explains acceptance. Therefore, there has been a need to further expand the boundaries of TAM to include a new set of beliefs to explain the acceptance of hedonic information systems. Davis and colleagues (1992) proposed the concept of perceived enjoyment. As per Eroglu and colleagues' (2001) suggestion, perceived enjoyment is used to capture the emotional reactions that are experienced when the web user interacts with the website. In fact, it has been proposed that the level of enjoyment of an activity is similar to the emotional response from environmental psychology (Koufaris 2002).

Perceived enjoyment has been defined as the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Davis et al. 1992). This concept emphasizes the extent to which the online user believes that interacting with the technology is fun or enjoyable, rather than focusing on the technology itself (Trevino and Webster 1992). Therefore, perceived enjoyment, in the context of the web, is a metric of the experience an online user has when interacting with different websites (Sanchéz-Franco and Roldán 2005). This factor is an important determinant in the acceptance of information systems (e.g., Davis et al. 1992; Igbaria et al. 1995).

Perceived enjoyment has been found to be an important determinant in predicting web use for hedonic purposes. Online users browse certain websites for their own sake, without any consideration for their practical or instrumental purposes (Chandon et al. 2000). The aim is to

optimize the amount of fun, playfulness, or pleasure experienced (Kempf 1999). Website browsing is now considered as a new form of recreation (Babin et al. 1994). The investment of time in such an activity is desired to extend the enjoyment being derived (Mathwick et al. 2001).

Several researchers have tested the importance of perceived enjoyment in predicting web acceptance and usage. The findings from these studies indicate that perceived enjoyment determines attitude toward using a website (Sanchéz-Franco and Roldán 2005; Van der Heijden 2003), intention to return to a website (Koufaris 2002; Koufaris et al. 2001-2002), intention to use a website (Sanchéz-Franco and Roldán 2005; Van der Heijden 2003; Van der Heijden 2004), and Internet usage (Atkinson and Kydd 1997; Moon and Kim 2001; Teo et al. 1999).

3.1.2.2.3 Relationship between Affective and Cognitive States

When exposed to the stimulus, in addition to the more compelling emotional responses, cognitive responses are automatically triggered to identify the presence of any possible constraints (Hoch and Loewenstein 1991). The absence of any constraints will lead to the impulse purchase, without any hesitation (Dholakia 2000). However, the presence of any constraints may impede the impulse buying process. Constraining factors can be considered as interrupts (Bettman 1979; Hoch and Loewenstein 1991), which warn the individual about the need of cognitive deliberation. Since IT mediates the relationship between the consumer and the product or the online retailer in an online context, in addition to the common constraining factors, such as the time and money available, the online user also faces constraining factors pertaining to the interface. Since the high task-relevant cues are necessary for the consumer's goal attainment (Eroglu et al. 2001), the absence of high task-relevant cues, in the form of the

features associated with structural firmness and functional convenience, will be considered as constraining factors.

In the presence of constraining factors, the consumer faces psychological conflict and struggle (Rook 1987). Consequently, the consumer evaluates his or her behavior. If the evaluation is positive, the constraining factor is not considered as being significant and the consumer will still act impulsively (Dholakia 2000). For instance, if the constraining factor is the availability of money, the consumer may use a credit card and still buy impulsively. In a sense, the positive evaluations further enhance the affective component of the impulse buying process, which results in the impulse purchase. In contrast, if the evaluation is negative, the consumer will use resistance strategies to end the impulse buying urge (Dholakia 2000). For instance, if the consumer feels that he or she does not have enough money, he or she will leave the premises of the store. The negative evaluations frustrate the user because not acquiring the product is considered as a loss (Hoch and Loewenstein 1991). The resulting negative affect leads to an avoidance behavior, which involves not buying the product. Therefore, a crucial element in the impulse buying process is believed to be a reduction of the negative cognitive evaluations when the consumer is exposed to the product (Piron 1991).

The cognitive evaluations have an enhancing or deterring effect on the resulting behavior through their influence on the emotional responses experienced. The influence of cognitions on affect has been proven in consumer behavior literature (e.g., Shiv and Fedorikhin 1999). For instance, the expenditure of cognitive effort has been associated with negative affect (Garbarino and Edell 1997). There is also evidence of the influence of affect on cognitions (e.g., Shiv and

Fedorikhin 1999). For instance, while processing information, affective reactions may be generated by both the process, as well as the information itself (Garbarino and Edell 1997). However, in the proposed model, this link is not hypothesized or deemed to be important as impulse buying is more emotional than rational (Rook 1987) and therefore, the behavior is driven by the emotional reactions rather than the cognitive reactions (Weinberg and Gottwald 1982). Even if the affective reactions have an effect on the cognitive reactions, the effect will only be minimal in the context of impulse buying. It is thus proposed that to increase the likelihood of impulse purchase, the cognitive reactions or perceived usefulness should have an enhancing effect on the affective reactions or perceived enjoyment.

3.1.3 The Response

The emotional and cognitive states lead to approach or avoidance behaviors (Eroglu et al. 2001). Impulse buying has been characterized as a highly reactive and affective behavior over which the individual has little cognitive control (Weinberg and Gottwald 1982). Therefore, the emotional component is imperative in the impulse buying process (Rook 1987), while the effect of the cognitive responses is only minimal (Weinberg and Gottwald 1982). Therefore, it is proposed that in the context of impulse buying, only the effect of the affective responses on the approach/avoidance behaviors should be studied. The cognitive responses will affect the approach/avoidance behaviors through their influence on the affective responses, rather than through a direct effect.

The concept of approach-avoidance has been defined "in a broad sense to include physical movement toward, or away from, an environment or stimulus, degree of stimulus,

degree of attention, exploration, favorable attitudes such as verbally or nonverbally expressed preference or liking, approach to a task (the level of performance), and approach to another person (affiliation)" (Mehrabian and Russell 1974, p. 96). In other words, approach behaviors are any positive actions directed toward the environment, such as intention to play, explore, and affiliate, while avoidance behaviors are the exact opposite. In a traditional offline commerce setting, typical approach behaviors include intention to return to a store and store exploration. Eroglu and colleagues (2001) have identified the approach behaviors that are typical in an online setting, which include intention to revisit the website and the exploration of the online store offerings.

A necessary condition in the impulse buying process is the exposure to the stimulus (Rook 1987). Physical proximity to the stimulus promotes the impulsivity of an individual, which increases the likelihood of an impulse purchase occurring (Hoch and Loewenstein 1991). An approach behavior, such as store exploration, will prolong exposure to the stimulus, thus encouraging the individual to be impulsive. In fact, people who enjoy store browsing as a form of recreation have been found to engage in more impulse purchases than non-browsers (Jarboe and McDaniel 1987). Consequently, store browsing has been found to be a central component in the impulse buying process (Beatty and Ferrell 1998). An approach behavior will therefore increase the likelihood of an impulse purchase.

3.2 Hypotheses

Based on a review of the relevant literature, a series of hypotheses was derived to empirically test the proposed research model. The main objective of this research endeavor was

to examine impulse buying in an online context. The model is based on the S-O-R framework drawn from environmental psychology and consequently, three main factors, namely the stimulus, the organism, and the response, should be considered. To maintain consistency with this overarching framework, the hypotheses related to the effect of the stimulus on the organism and those related to the influence of the organism on the response will be derived in separate subsections below. In the first subsection, the effect of the high task-relevant cues (i.e., structural firmness and functional convenience) and low task-relevant cues (i.e., representational delight) on perceived usefulness and perceived enjoyment will be examined. The second subsection covers the hypotheses linking perceived usefulness and perceived enjoyment to approach/avoidance behaviors, and how these affect the online impulse buying behavior.

3.2.1 The Stimulus and the Organism (Hypotheses H_1, H_2, and H_3)

Three specific hypotheses about the effect of the high task-relevant and low task-relevant cues on perceived usefulness and perceived enjoyment are derived. In the first subsection, the relationship between high task-relevant cues (i.e., structural firmness and functional convenience) and perceived usefulness will be examined, followed by the influence of low task-relevant cues on perceived enjoyment. The final subsection covers the relationship between perceived usefulness and perceived enjoyment.

3.2.1.1 High Task-Relevant Cues and Perceived Usefulness (H_1)

High task-relevant cues include "all the site descriptors which facilitate and enable the consumer's shopping goal attainment" (Eroglu et al. 2001, p. 179-180). Examples of such cues include merchandise descriptions, product price, and navigation aids. Since these cues help the

online shopper to attain his or her shopping goal, these cues can be considered as being of a utilitarian nature (Babin et al. 1994). The online consumer evaluates these cues based on their usefulness in the attainment of the shopping goal. Therefore, the perceived usefulness of a particular website will depend on the presence of high task-relevant cues, such as the features associated with structural firmness and functional convenience.

Particular features within the structural firmness macro-category have been found to affect the perceived usefulness of a website. The most important feature within this macro-category is the extent to which the site is perceived as being secure. Salisbury and colleagues (2001) tested and found support for the relationship between perceived usefulness and *perceived web security*. This finding implies that online consumers will only use those websites that they feel will safeguard their credit card numbers and other sensitive information. Similarly, it has been found that web users determine which sites to use based on their *download delay* (Palmer 2002), which is another feature of structural firmness. Since web users are unwilling to wait for more than a few seconds for a response from a website, they will choose websites which have fast response times, so that they can attain their goal in an efficient and timely manner.

Features within functional convenience are also important determinants of the perceived usefulness of a website. The most common feature that has been examined is the perceived *ease of use* of a website. Perceived ease of use has been defined as the degree to which the prospective user expects the target system to be free of effort (Davis 1989; Davis et al. 1989). Several researchers have tested the relationship between perceived ease of use and perceived usefulness in an online context (e.g., Koufaris 2002; Pavlou 2001; Van der Heijden 2004;

Vijayasarathy 2004). Another concept within functional convenience which is closely related to the concept of ease of use is the *ease of navigation*. It is the extent to which navigating a website is perceived to be free of effort (Salisbury et al. 2001). A positive relationship has been found between perceived ease of navigation and perceived usefulness. Web users also determine which sites to use based on the their *interactivity* and *responsiveness*, as well as the *quality* of the presented content (Palmer 2002), which are all features of functional convenience.

The high task-relevant cues will also have an impact on the perceived enjoyment. The absence of these cues will have a negative impact on the enjoyment derived from interacting with the particular website. For instance, a website with poor download delay or navigability will frustrate a user making him switch to another website. In contrast, the presence of such cues will heighten the enjoyment derived when interacting with the website. Further, it has been found that ease of use has a positive effect on perceived enjoyment (Van der Heijden 2003; Van der Heijden 2004). However, just as perceived usefulness is a better determinant than perceived enjoyment in the acceptance of utilitarian information systems (Van der Heijden 2004), high task-relevant cues will have a greater impact on perceived usefulness than on perceived enjoyment, because of their utilitarian nature. Thus, the following hypothesis is proposed:

H_1: *High task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment.*

3.2.1.2 Low Task-Relevant Cues and Perceived Enjoyment (H_2)

Low task-relevant cues refer to "the site information that is relatively inconsequential to the completion of the shopping task" (Eroglu et al. 2001, p. 180). Low task-relevant cues include

colors, typestyles and fonts, animation, and music. These cues have been found to create a mood for the site, which makes the consumer's online experience a more pleasurable one (Eroglu et al. 2001). Consequently, low task-relevant cues increase the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of online shopping. The online consumer evaluates these cues based on the amount of enjoyment, playfulness, and pleasure experienced. Therefore, the perceived enjoyment of a particular website will depend on the presence of low task-relevant cues, such as the features associated with representational delight.

Indeed, particular features within the representational delight macro-category have been found to affect perceived enjoyment. One of the features within this macro-category which has received the most attention from researchers is a website's visual appeal. A website's perceived attractiveness, which is similar to its visual appeal, has been defined as "the degree to which a person believes that the website is aesthetically pleasing to the eye" (Van der Heijden 2003, p. 544). The perceived attractiveness of a website has been found to increase the level of enjoyment experienced when interacting with a website (Van der Heijden 2003). Consequently, visual appeal plays an important role in the decision to use a website, through its influence on perceived enjoyment. A new form of recreation which is becoming more popular is web browsing, which is an "ongoing search activity that may be independent of specific purchase needs, or decisions" (Karayanni 2003, p. 143). It has been proposed that the enjoyment derived from browsing the Internet for entertainment determines the actual use of certain websites (Davis et al. 1992). Another feature within representational delight that has received considerable attention from researchers is the concept of flow, which has been defined as an optimal and enjoyable

experience (Csikszentmihalyi 1975). It represents the web user's perception that the interaction with the website is enjoyable (Hoffman and Novak 1996). The experience of flow has been found to be positively correlated with experiential uses of the web, web usage, and the amount of time a web user spends at a particular website (Novak et al. 2000).

The presence of features related to representational delight on a website will also have an effect on its perceived usefulness. The consequences of aesthetics on usefulness have been studied in psychology and marketing, where it has been found that people associate more favorable attitudes towards attractive individuals or products (Dion et al. 1972). This finding has been replicated in the information systems domain. The perceived attractiveness of a system or a website has been found to increase its perceived usefulness (Tractinsky et al. 2000; Van der Heijden 2003). Tractinsky and colleagues (2000) label this finding as "what is beautiful is usable". However, because of their hedonic nature, low task-relevant cues are enjoyed more for their own sake, than for their instrumental or practical purposes (Chandon et al. 2000). For instance, perceived attractiveness has been found to explain perceived enjoyment better than it does perceived usefulness (Van der Heijden 2003). Thus, the following hypothesis is provided:

H₂: *Low task-relevant cues will have a greater effect on perceived enjoyment*

than on perceived usefulness.

3.2.1.3 Perceived Usefulness and Perceived Enjoyment (H₃)

High task-relevant cues facilitate the acquisition of the product (Eroglu et al. 2001). Therefore, their presence is crucial for the occurrence of an online impulse purchase. When the consumer interacts with the web interface, in addition to the emotional responses experienced

when interacting with the website, he or she will be unconsciously evaluating the presence of these cues. Consequently, this evaluation will help further enhance the emotional reaction, which will increase the probability of an impulse purchase occurring (Beatty and Ferrell 1998). For instance, while browsing a website, the consumer will have a notion of the website's speed and ease of use, which will further enhance the pleasure derived from interacting with the website.

Furthermore, the presence of these cues will be crucial at the ordering phase to maintain the positive reactions. These reactions can be maintained through the provision of high task-relevant cues, such as ease of ordering and the provision of security seals. For instance, Amazon.com provides an easy ordering system, referred to as single-click ordering or one-click ordering. The consumer can enter his or her personal information and shipping preferences with the guarantee that this information will be secure. When ordering a book, the individual does not have to go through the lengthy process of entering information each time. Therefore, the process of ordering a book can be completed within a minute (Chaudhury et al. 2001). The absence of high task-relevant cues will be perceived as constraining factors, which may lead to negative emotional reactions, thus stalling the impulse buying process.

Therefore, to increase the likelihood of online impulse buying, it is proposed that affective reactions should be maximized, while keeping negative cognitive evaluations to a minimum (Weinberg and Gottwald 1982). Affective reactions, or perceived enjoyment, can be maximized through the provision of the low task-relevant cues, such as the visual appeal (Van der Heijden 2003). Similarly, negative cognitive evaluations can be kept to a minimum through the provision of the high task-relevant cues, such as security and download delay. More

specifically, it is proposed that for an online purchase to occur, there should be a positive

relationship between perceived usefulness and perceived enjoyment, which will further enhance

the emotional nature of the impulse purchase behavior.

H₃: *Perceived usefulness will have a positive effect on perceived enjoyment.*

3.2.2 The Organism and the Response (Hypotheses H₄ and H₅)

Two specific hypotheses about the effect of the organism on the response are derived. In

the first subsection, the relationship between the organism (i.e., perceived enjoyment) and

approach/avoidance behaviors will be examined. The next subsection covers the relationship

between approach/avoidance behaviors and the online impulsive buying behavior.

3.2.2.1 Perceived Enjoyment and Approach/Avoidance Behaviors (H₄)

According to the S-O-R framework, emotional responses lead to approach or avoidance

behaviors. Approach behaviors are any positive actions directed toward the environment, such as

intention to play, explore, and affiliate, while avoidance behaviors are the exact opposite. Eroglu

and colleagues (2001) proposed that the approach behaviors that are typical to an online setting

include intention to revisit, amount of money or time spent in the online store, and exploration of

the online store offerings. In the offline shopping context, a positive relationship has been found

between enjoyment and approach behaviors (Beatty and Ferrell 1998). People who are enjoying

themselves in a shopping environment will try to maintain this positive emotional state by

prolonging their visit in the shopping context. Thus, the following hypothesis is derived:

H₄: *Perceived enjoyment will have a positive influence on approach*

behaviors.

3.2.2.2 Approach/Avoidance Behaviors and Impulse Buying (H$_5$)

A necessary condition in the impulse buying process is the exposure to the stimulus (Hoch and Loewenstein 1991). Any approach behavior to the environment will increase exposure to the stimulus, which can improve the likelihood of an impulse purchase. For example, in an offline context, it has been proposed that the notion of in-store browsing is a central component in the impulse buying process (Beatty and Ferrell 1998). Similarly, in an online context, it is proposed that an approach behavior, such as web browsing, will increase the likelihood of an impulse purchase. Thus, the following hypothesis is offered:

> *H$_5$:*   *An approach behavior will increase the likelihood of an impulse purchase*
>
> *occurring.*

3.3 Summary

The main objective of this research endeavor is to develop and test a model that explains impulse buying in an online context. In this chapter, the necessary foundation to develop this model was provided. The research model leverages the S-O-R framework as a meta-framework to examine online impulse buying. The appropriate stimulus, organism, and response factors were identified. The stimulus is represented by high task-relevant cues and low task-relevant cues, perceived usefulness and perceived enjoyment represent the organism, while the response is the approach/avoidance behaviors that lead to impulse buying. Based on the developed research model, a total of five hypotheses were proposed and these are provided in table 3.4. The research model along with the hypotheses is also proposed in Figure 3.2.

Once the research model is developed and specific hypotheses are derived, the next step

in the research process is to subject the model to empirical examination. The next chapter

provides a discussion of the research methodology utilized to test the proposed model. The

chapter also includes the research design, information about the sample, operationalization of the

different constructs used as well as the procedures used to carry out the study.

Table 3.4: Research Hypotheses

Hypothesis	Specific Hypothesis
1	High task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment.
2	Low task-relevant cues will have a greater effect on perceived enjoyment than on perceived usefulness.
3	Perceived usefulness will have a positive effect on perceived enjoyment.
4	Perceived enjoyment will have a positive effect on approach behaviors.
5	An approach behavior will increase the likelihood of an impulse purchase occurring.

Figure 3.2: The Research Model with the Hypotheses
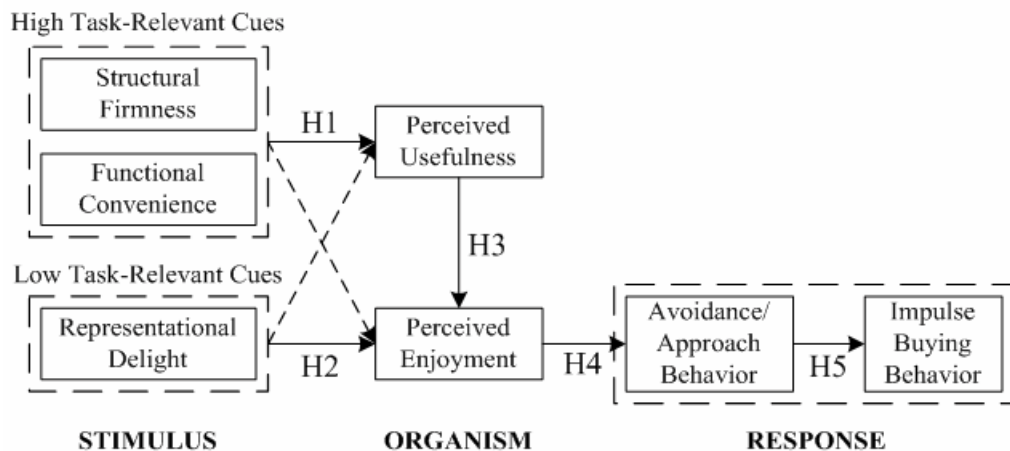
CHAPTER 4

RESEARCH APPROACH AND METHODOLOGY

Once the research model is developed and specific hypotheses have been derived, the next step in the research process is to subject the proposed model to empirical examination. This chapter provides the justification for the proposed research methodology as well as the description of a study that was used to test the proposed hypotheses. A comprehensive description is provided including information about the research design used, subjects, interface treatments, experimental tasks, variables, and experimental procedure.

4.1 Research Methodology

A research methodology is defined as "a structured set of guidelines or activities to assist in generating valid and reliable research results" (Mingers 2001, p. 242). There is a wide gamut of research methods to choose from. These research methods can be evaluated on three dimensions, namely generalizability, realism, and precision, which are referred to as the "three-horned dilemma" (McGrath 1982). The aim of the researcher is to select a research method that is most appropriate to the study's objective and also, optimizes these three dimensions (McGrath 1982). However, this is practically impossible. All research methods have their own strengths, but each of them is flawed in some way or the other (Dennis and Valacich 2001; McGrath 1982). Thus, the best strategy is to choose a research method that strikes a balance between two of these dimensions.

4.1.1 Availability of Various Research Strategies

Various research methods or strategies are available to the researcher who has adopted a

positivist perspective. McGrath (1982) proposes eight of them which are broken down into four quadrants (see Figure 4.1). The strategies in Quadrant 1 take place in natural settings, the ones in Quadrant II occur in controlled settings, the ones in Quadrant III allow the researcher to study behaviors which are not dependent on a setting, while the strategies in Quadrant IV do not involve empirical studies (McGrath 1982). A review of the research strategies is provided before the most appropriate method will be chosen for the current research.

Figure 4.1: Research Strategies (from McGrath 1982)
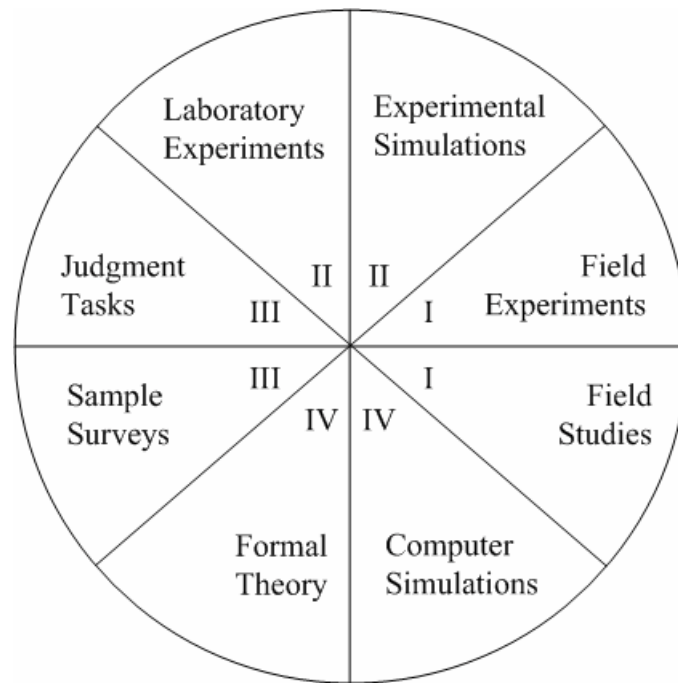
4.1.1.1 Quadrant I Research Strategies

Quadrant I includes field studies and field experiments. The value of these particular research strategies is that they allow the researcher to develop theoretical models in a natural setting (Zmud et al. 1989). The findings from these studies can be used for theory testing and can provide solutions to real organizational problems as they capture the behavior of the subjects in a

very natural setting (Zmud et al. 1989). The main advantage of these research strategies is that they maximize realism (Dennis and Valacich 2001). However, since the researchers adopt an unobtrusive approach to observation (McGrath 1982), there is little or no control over nuisance variables, which implies that these strategies fail to satisfy precision. Moreover, when using these methods, researchers usually have to narrow down their research focus, only studying a small set of the sample within the natural setting, which makes generalizability of the findings to the population quite difficult. To summarize, field studies and experiments maximize realism, but fail to fulfill the requirements of generalizability and precision (Dennis and Valacich 2001).

4.1.1.2 Quadrant II Research Strategies

The research strategies in Quadrant II include laboratory experiments and experimental stimulations. According to Stone (1978), these strategies are characterized by four components. First, they occur in an artificial setting which is created by the researcher. Second, the researcher assigns the subjects to the different experimental conditions. The third component is the manipulation of the independent variables and the assessment of their impact on selected dependent variables. Finally, as a result of these three components, the researcher has unmistakable control over virtually all the variables involved. Consequently, these research strategies maximize precision, in favor of generalizability and realism (Dennis and Valacich 2001). Since these methods use controlled settings, realism is sacrificed. Furthermore, only a small sample of the population is chosen and with the control over different variables, generalizability is compromised. However, these strategies allow the discovery of new relationships, which are not evident in a natural setting (Weick 1967).

4.1.1.3 Quadrant III Research Strategies

Quadrant III consists of judgment tasks and sample surveys. Researchers using these strategies try to exclude the context when studying the behavior of interest. The aim of these research strategies is to collect data in a systematic way from a very large sample (Benbasat 1989). Consequently, these research strategies maximize generalizability, since inferences can be made about the population based on the data collected. However, these strategies fail to meet the requirements of realism and precision (Dennis and Valacich 2001).

4.1.1.4 Quadrant IV Research Strategies

The research strategies within Quadrant IV include formal theories and computer simulations. These strategies are not empirical, but rather are theoretical and consequently, no observation of behavior is required (McGrath 1982). Formal theories are universal as they explain general phenomenon, rather than focusing on people's behaviors in specific settings. Consequently, formal theories fail to satisfy the three-horned dilemma. In contrast, computer simulations allow the researcher to model particular systems based on a few number of selected factors. This results in a maximization of precision in favor of realism and generalization.

4.1.2 Choosing the Most Appropriate Research Strategy

After reviewing these different available methods, the next step involves making a decision on what method will be the most appropriate for this research endeavor, while keeping in mind that no method is flawless. The review of literature on online impulse buying reveals that this research stream is still in its very early stages. The use of surveys or field studies in the study of this phenomenon has led to inconclusive findings (Koufaris 2002; Koufaris et al. 2001-

2002). Thus, there is a need to study this phenomenon closely to establish cause and effect relationships, while controlling for any extraneous variables. A maximization of precision is needed to understand the effect of different website interface characteristics on this behavior. Therefore, a laboratory experiment is deemed as being the most appropriate research method for this research endeavor. Indeed, Madhavaram and Laverie (2004) indicate that "experimental studies would greatly enhance our overall understanding of impulse buying phenomenon" in an online setting (p. 65). Once an initial understanding of the phenomenon is gained through this study, the findings can be replicated in more natural settings to establish generalizability (Cook and Campbell 1979).

4.2 Pilot Study

To ensure a valid study, it has been suggested that pilot studies should be conducted to address any issues associated with the task or the constructs used (Jarvenpaa et al. 1985). Therefore, a pilot study was conducted to ensure that the manipulation was salient, to refine the experimental procedures, to conduct a preliminary construct validation process, and to perform a preliminary test of the hypotheses (see Appendix B). Three hundred and forty-nine subjects were recruited from an introductory marketing class to participate in this pilot study.

Based on the results of this pilot study, several measures were taken to enhance the internal validity of this study. The most important lesson learned from the pilot study was that the researcher should have absolute control over the experimental setting. Second, since the manipulation of the high task-relevant cues was not effective, changes were made to the experimental interfaces. A factor analysis revealed that the measure for capturing the emotional

reactions had poor psychometrics. Thus, a decision was made to use different measures that are more conducive of information systems research. For detailed results, refer to Appendix B.

4.3 Research Design

The specific hypotheses to be tested in this study are provided in Table 4.1. Laboratory experiments allow the researcher to test predictions derived from theory by providing a means for studying relationships under controlled, unconfounded situations (Kerlinger 1986). The independent variables are manipulated and the impact on selected dependent variables is assessed. Consequently, the researcher has unmistakable control over virtually all the variables involved.

Table 4.1: Research Hypotheses

Hypothesis	Specific Hypothesis
1	High task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment.
2	Low task-relevant cues will have a greater effect on perceived enjoyment than on perceived usefulness.
3	Perceived usefulness will have a positive effect on perceived enjoyment.
4	Perceived enjoyment will influence avoidance/approach behaviors.
5	An approach behavior will increase the likelihood of an impulse purchase occurring.

4.3.1 Chosen Research Design

The main objective of this research endeavor is to develop and test a model that explains impulse buying in an online context. More specifically, the effect of low and high task-relevant cues on impulse buying is examined. A full 4 x 1 factorial design was used to test the proposed hypotheses. The presence of low and high task-relevant cues was manipulated in the study. The subjects were exposed to one of four interfaces: one which contained neither the high task-

relevant cues nor the low task-relevant ones, the second included only the low task-relevant cues, the third one only contained the high task-relevant cues, and finally, the last one contained both the low and high task-relevant cues.

The research design used for this study is shown below. Based on the treatment group he or she was in, the subject viewed one interface after which he or she filled a questionnaire to assess the interaction with the website.

R		O_C
R	X_{LT}	O_{LT}
R	X_{HT}	O_{HT}
R	X_{LT+HT}	O_{LT+HT}

R   : depicts random assignment of subjects.

X_{LT} : refers to the low task-relevant cues condition.

X_{HT} : refers to the high task-relevant cues condition.

X_{LT+HT} : refers to the low and high task-relevant cues condition.

O_C : refers to the measurement in the control condition.

O_{LT} : refers to the measurement in the low task-relevant cues condition.

O_{HT} : refers to the measurement in the high task-relevant cues condition.

O_{LT+HT} : refers to the measurement in the low and high task-relevant cues condition.

4.3.2 Threats to Internal Validity

Since no research method is flawless (Dennis and Valacich 2001; McGrath 1982), it is essential to recognize the potential weaknesses of the chosen method. Laboratory experiments maximize precision, at the expense of realism and generalizability. To ensure that any extraneous

variables are controlled and to further strengthen the robustness of the findings from this study, the internal validity of the study should be ensured (Cook and Campbell 1979). Internal validity refers to the extent to which the observed outcomes in the dependent variables are the result of the manipulation of the independent variables, and not of any other extraneous variables (Cook and Campbell 1979). Thirteen threats to internal validity have been identified, of which four are particularly critical to this study, namely history, diffusion, selection, and ambiguity about the direction of causal influence.

4.3.2.1 History

The first threat to internal validity which is salient to this study is *history*. It refers to the situation where events in the subject's environment affect the results of the study (Cook and Campbell 1979). These events occur outside the experimental setting, but still have an effect on the results of the study. For instance, in this study, one subject's friend was sick and consequently, he could not attend the research session he signed up for. Other events can also occur that affect all the subjects in one research session. A good example of such an event is the September 11, 2001 terrorist attacks, which disrupted the life of every American. To address the issues related to history, research sessions were carried on different days over a five-week period. This allowed the subject mentioned above to sign up for a different date and still participate in the study or a research session to be conducted on an entirely different day to compensate for any disruptions.

4.3.2.2 Diffusion

Because the study was made available over the course of five weeks, *diffusion* was a

potential threat to internal validity. Diffusion occurs when individuals from different experimental groups interact with each other and exchange information about the study being conducted (Cook and Campbell 1979). This exchange of information can have serious impacts on the results of the study, especially when subjects come to the research session already knowing what is expected of him or her. Diffusion can also be a problem when different treatment conditions are conducted within the same research session. To address the issues, the number of subjects within each session was kept below 18 so that they could be dispersed in the chosen room. This ensured that they could not view each other's computer screen or talk to each other. Furthermore, in one research session, only one research treatment was used. The subjects were also asked not to divulge information about the study once they left the room.

4.3.2.3 Selection

Selection occurs when subjects are not assigned in a way that ensures the groups are comparable. Selection bias can lead to groups of unusual composition which can significantly affect the results of the study. In such cases, the differences in the dependent variable cannot be attributed only to the manipulation of the independent variables. To rule out the possibility of selection bias, random assignment of the subjects to the different treatment groups is imperative. The randomization process ensures that groups compared are equivalent in all respects except for the experimental treatment. The randomization process will be checked for validity later in this chapter.

4.3.2.4 Ambiguity about the Direction of Causal Influence

The last threat to internal validity that needs to be considered in this study is *ambiguity*

about the direction of causal influence. In this case, there remains some confusion about whether one particular variable affects the other or whether the influence occurs in the reverse order (Cook and Campbell 1979). This threat to internal validity is particularly salient in studies, such as this one, because of its cross-sectional nature (Cook and Campbell 1979). However, it is believed that since the research model was based on strong theoretical arguments, the direction of causality is established.

4.3.3 Threats to External Validity

Laboratory experiments maximize precision at the expense of generalizability and realism (Dennis and Valacich 2001). Consequently, external validity will always be a concern in such experiments. However, it has been argued that the experimental setting resembles or is a special case of a real-life setting (Benbasat 1989). Moreover, since theories rather than findings enable generalization, powerful ideas may aid in understanding more than a surface resemblance between the laboratory and the field (Dennis and Valacich 2001). Generalizations can be made by testing the theory in alternative settings (Cook and Campbell 1979). Given the constraints of time and resources, the present research only reports the findings of an experiment carried out to test the hypotheses. Replication in more natural settings as a means to improve external validity is considered as a future research endeavor.

In the present research, generalizability was enhanced by selecting an appropriate sample, which allows the findings to be generalized to the population. Moreover, realism was ensured by using experimental interfaces that were very similar to the ones that the subjects will usually interact with. The steps taken to maximize generalizability and realism will be discussed further

in the Sample and Interfaces Used sections respectively in this chapter.

4.4 Subjects

After choosing the research strategy to be used and determining the research design, the next step involves recruiting subjects to participate in the laboratory experiment. The process that was used to determine the sample size and recruit the subjects is described in the following subsections.

4.4.1 Use of Sample Size to Ensure Statistical Power

An important consideration in a laboratory experiment is a sufficient number of subjects to ensure statistical power. Statistical power refers to the probability that the experiment will detect the difference between the treatment groups, if the difference actually exists (Shavelson 1988). There are four factors that influence statistical power, namely the level of significance, the magnitude of the treatment effect, variability in the population, and the sample size. The *level of significance* is the probability of obtaining the observed difference in the dependent variable (Shavelson 1988). Statistical power increases as the level of significance increases. The *effect size* is a measure of the strength of a treatment effect and the greater the effect size, the greater the power (Shavelson 1988). A third factor affecting statistical power is the *variability in the population*. If the level of significance, the sample size, and the effect size are kept constant, the smaller the standard deviation of the population, the more powerful the statistical test is. Finally, the greater the *sample size* is, the greater the power.

The sample size is one of the most important factors to influence power (Shavelson 1988). Increasing the sample size decreases the variability of the sample distribution while

increasing the effect size, thus providing greater statistical power. Therefore, to increase

statistical power, an appropriate sample size was determined a priori for the current research

endeavor. In well established research streams, the researcher can infer from published studies

what sample size would produce small, medium, and large effect sizes. However, since this

research topic is quite new and no empirical studies exist that have operationalized this particular

research model, this inference was impossible.

4.4.2 Determining Sample Size

Thus, to determine the number of subjects needed for this study, a power analysis

program, G*Power, was used instead. This program performs high-precision statistical power

analyzes. Given different effect sizes, alpha levels, and power analyzes, this program computes

the sample sizes needed. Using G*Power, the figures in Table 4.2 were obtained for small (0.2),

medium (0.5), and large effects (0.8) to attain 95 % power.

Table 4.2: Results of A-Priori Power Analysis Using G*Power

Effect Size	Significance Level	Statistical Power	Sample Size	Actual Power
0.2: Small	0.05	0.95	1084	0.9501
0.5: Medium	0.05	0.95	176	0.9514
0.8: Large	0.05	0.95	70	0.9524

The larger the sample is, the higher the statistical power (Shavelson 1988). For greater

power, the smaller effect size with 1084 subjects should be chosen. However, a small effect size

may produce significant results, but lacks relevance. A medium effect strikes a balance between

statistical significance and practical relevance. Therefore, the medium size effect is selected.

Indeed, it has been suggested that when the exact effect size to be used is not known, a medium

effect size should be used (Cohen 1988). A minimum of 176 subjects is therefore needed to attain 95.14 % power for a medium effect of 0.5 at the 0.05 significance level. Since a laboratory experiment with a full 4 x 1 factorial design is being used to test the hypotheses, this implies that there should be at least 44 subjects in each treatment condition.

4.4.3 Recruiting Subjects

The faculty member teaching an introductory information systems class at Washington State University was approached and he agreed to offer course credit to the students who volunteered to participate in this study. A brief description of the study was provided to his class and also, a link was added to the course webpage to provide more information about the study. By clicking on the link, students could read a description of the study, the available times, and the contact information of the researcher. The students were also notified that they would get course credit in return for their participation.

The students sent an email to the researcher with three possible times they could attend a research session. The researcher replied via an email and confirmed one of these times. A day before the scheduled date, the researcher sent out reminder emails to the subjects. For the signup materials and the emails, please refer to Appendix C. A total of 221 students participated in the experiment. The responses from 5 subjects had to be disregarded because of many missing responses, which resulted in 216 subjects, with 54 in each experimental group.

4.4.4 Assessing the Validity of Randomization Process

As indicated in the Research Design section, one threat to the internal validity of this experimental study is selection bias, where the composition of one or more of the treatment

groups is unusual, making it difficult to make comparisons across the different groups. Randomization of the sample ensures that the groups compared are equivalent in all respects except for the experimental treatment. Therefore, it is essential to check the validity of the randomization process used in this study.

Before interacting with the website, the subjects filled a short questionnaire, which captured their age, gender as well as an average of the number of online purchases they have made so far. The average number of online purchases made gives an indication of the subjects' experience as online shoppers. Separate univariate analyzes of variance were conducted for gender, age, and the average number of online purchases made to check the validity of the randomization process used.

Table 4.3: Comparing the Subjects Within the Treatment Groups

Variable	Group	N	Mean	SD	Significance Test
Gender (0 = male, 1 = female)	Control	54	0.52	0.50	$F(3,212) = 1.859$ $p = 0.138$
	LTR	54	0.43	0.50	
	HTR	54	0.44	0.50	
	LTR+HTR	54	0.63	0.49	
	Total	216	0.50	0.50	
Age (Years)	Control	54	19.52	4.21	$F(3,212) = 2.127$ $p = 0.098$
	LTR	54	20.83	3.75	
	HTR	54	19.85	3.65	
	LTR+HTR	54	18.94	4.31	
	Total	216	20.26	4.02	
Number of online purchases (0 = None)	Control	54	17.91	29.95	$F(3,212) = 1.313$ $p = 0.271$
	LTR	54	35.44	134.95	
	HTR	54	22.44	37.02	
	LTR+HTR	54	8.57	8.61	
	Total	216	21.09	71.84	
LTR: Low task-relevant cues *HTR: High task-relevant cues*		*LTR+HTR: Both low and high task-relevant cues* *Control: Absence of low and high task-relevant cues*			

An analysis of the results of univariate analyzes of variance indicates that there were no significant differences among the different treatment groups in terms of gender, age, and the average number of online purchases at the 0.05 significance level (see Table 4.3). Based on these results, it is concluded that the randomization process for this study was valid, as there were no striking differences among these experimental groups. Approximately half of the subjects were females (49.5 %) and the average age of the subjects was 20.26 years. On average, these subjects had bought 21 products online.

4.4.5 Appropriateness of Sample

The use of a sample of homogenous students as subjects can be criticized because of generalizability issues. However, it is believed that the sample is appropriate for this study, based on a study reported in the Pew Internet & American Life Project. The aim of this project is to produce reports that explore the impact of the Internet on individuals at their work and in their everyday life. According to this study carried out in February to March 2005, it was found that the age of the people who mostly use the Internet ranges between 18 and 29 and that females used the Internet as often as males (Pew Internet & American Life Project 2005). The main conclusion drawn from this study was that college students are the heaviest Internet users. It is thus believed that the sample chosen for this study is representative of this larger population and therefore, results from this study can be generalized to this population of Internet users.

4.5 Interface Treatments

The goal of this research endeavor was to examine the influence of low and high task-relevant cues on online impulse buying. To accomplish this research goal, a fictitious online

store, Totebags.com, was created for this experiment. This online store was specialized in selling tote bags along with various accessories, such as CD cases, iPod cases, and cell-phone holsters. Tote bags were chosen as the product of interest for this experiment because these bags as well as the available accessories are salient to this sample of college students in their everyday life.

The interface was designed and developed by a graduate of Washington State University. This person took an electronic commerce (e-commerce) class from one of the principal investigators and through this class and other projects, had shown his remarkable skills as a web designer. For a given sum of money, he designed the four interfaces that were required for this experiment. After the interfaces were deemed to be satisfactory, ownership of all the materials related to the interfaces was transferred to the principal investigators, so that if and when needed, changes could be made to any parts of the interface. These interfaces were hosted on one of the university's servers so that latency and bandwidth issues were equivalent.

The foremost goal when designing the interfaces was to make them as realistic as the websites with which these subjects would typically interact. For that reason, product content and images used on the interfaces were taken from the website of an existing tote bag manufacturer, Timbuk2. The interfaces were intentionally designed to emulate this existing website. In informal talks with the subjects after the experiment, it was evident that the subjects perceived these websites as being realistic proxies for typical e-commerce websites as they were very concerned about entering their private information for fear of being charged for any products in their shopping carts. To control for any confounds, subjects were asked if they were familiar with Timbuk2 or whether they have purchased products from the Timbuk2 website. Any subjects

who responded positively were subsequently removed from the data set.

Four different interfaces were developed for the experiment, where the presence of the low and high task-relevant cues was manipulated. The first interface, v1, was the control, containing neither the low nor the high task-relevant cues. The second interface, v2, contained only the low task-relevant cues, while the third interface, v3, consisted of only the high task-relevant cues. Finally, the last interface, v4, included both the low and high task-relevant cues. Table 4.4 below depicts a summary of this information.

Table 4.4: Manipulation of Low and High Task-Relevant Cues Across Interfaces

	v1	v2	v3	v4
Low task-relevant cues	x	o	x	o
High task-relevant cues	x	x	o	o

x – Cues absent
o – Cues present

As indicated in the previous chapter, structural firmness and functional convenience can be considered as high task-relevant, while representational delight can be classified as low task-relevant. The table above indicates that three of the designed interfaces missed certain cues. Since the foremost goal when designing the interfaces was to make them as realistic as possible, an appropriate level of each of the macro-categories was still provided to maximize the realism of the interfaces. For example, the interfaces that did not contain the high task-relevant cues (i.e., v1 and v2) could be designed so that it was very cumbersome to navigate the web pages. However, this was not very realistic and therefore, such drastic measures were not taken.

Appendix D contains screen shots of different pages of the different interfaces. Through these screen shots, the manipulation of the different features is depicted. In order to test the

proposed technology hypotheses using these interfaces, it is imperative to verify that the interface manipulations are successful. In this chapter, the measures that were used for manipulation checks are presented, and in the next chapter, the results of the manipulation checks will be provided. Next, the manipulations are presented.

4.5.1 Manipulating the High Task-Relevant Cues

The high task-relevant cues were manipulated through the presence or absence of important features within structural firmness and functional convenience. In the next subsections, the particular features which were manipulated within each of these two macro-categories are presented.

4.5.1.1 Manipulating Structural Firmness

Based on a review of the body of literature on structural firmness, *security* can be considered to be a top, if not the top, priority for web users, particularly for e-commerce domains (Zhang and Von Dran 2001-2002). In the initial pilot test, the security and privacy policy was not included on the interfaces that did not contain the high task-relevant cues and the subjects were pointed to this lack of information. However, the subjects did not perceive this lack of information as an indication of a lack of security and consequently, the manipulation of security was not strong enough, as evidenced by the manipulation checks (see Appendix B).

When using experimental designs, the aim of the researcher should be to maximize the differences between the treatments, such that the impact of the different levels of the independent variable on the dependent variables is evident (Dennis and Valacich 2001). For that reason, the security information provided on the interfaces was altered to make the security manipulation

more salient. Security was manipulated through the information provided in the security and privacy policy and the provision of security seals at the checkout stage (see Appendix D for screenshots). For interfaces v1 and v2, which did not include structural firmness, no security seals were provided and the security and privacy policy provided raised concerns about both security and privacy concerns (see Table 4.5). In contrast, for interfaces v3 and v4, security seals were provided at checkout and through the security and privacy policy, the web retailer ensured the protection of the consumer's information (see Table 4.5). This manipulation worked better (discussed in next chapter).

Table 4.5: Security and Privacy Policy

Websites	HTR	Script within Security and Privacy Policy
v1 and v2	Absent	We attempt to take reasonable precautions to protect your privacy and to secure your sensitive information (e.g., credit card number). However, given the widespread fraud and identity theft that is occurring via the Internet, Totebags.com cannot guarantee that your private and sensitive information is 100% secure and does not assume responsibility should such information become compromised.
v3 and v4	Present	Totebags.com knows that you care how your information is used and shared, and we cultivate your trust carefully and sensibly. To ensure a high level of trust and privacy for our customers, Totebags.com is endorsed by TRUSTe® and Verisign®, two leading online consumer advocacy organizations.

Another important characteristic that reflects the quality of an eCommerce interface is download delay (Palmer 2002). The websites that did not contain the high task-relevant cues had a download delay of 4 seconds. In the initial pilot test, about forty students participated in each research session (see Appendix B). However, this quickly led to serious issues when using these particular websites with high download delay. The server was bogged down because too many

people were trying to access it at the same time. This caused multiple errors when interacting

with the websites. Subjects had various products in their shopping carts, even though they never

"purchased" them. Consequently, for the experimental conditions where the high task-relevant

cues were absent, no more than eight subjects participated in the sessions at any time.

4.5.1.2 Manipulating Functional Convenience

An important feature within functional convenience is *ease of use*. In the context of e-

commerce, this feature has been found to be an important determinant of an individual's

intention to use a website (e.g., Koufaris 2002; Pavlou 2001; Van der Heijden 2004;

Vijayasarathy 2004). Functional convenience was manipulated by changing the ease of using the

website to make a purchase. In interfaces v3 and v4, which contained high task-relevant cues, in

addition to seeing the product of interest, the subject could easily add an item in the shopping

cart (see Appendix D for screenshots). However, for interfaces v1 and v2, which did not contain

the high task-relevant cues, the subject was forced to remember which product he was interested

in, as well as its size and color, and go through an ordering process which was not very intuitive

(see Appendix D for screenshots). Moreover, it was not very easy to navigate the different web

pages. Choosing and purchasing a particular product required the user to go through at least three

web pages.

4.5.2 Manipulating the Low Task-Relevant Cues

The low task-relevant cues were manipulated through the presence or absence of different

features within representational delight. The most important feature within this category of e-

commerce interface characteristics is *visual appeal*, which relates to the presence of visual

elements, such as colors, which enhance the overall look of the website (Van der Heijden et al. 2003). The homepage of the four different interfaces gives an indication of the manipulation of visual appeal. For interfaces v2 and v4, the homepage was very pleasing with a nice combination of colors (see Appendix D for screenshots). In contrast, for interfaces v1 and v3, which did not contain the low task-relevant cues, the homepage was not soothing to the eye, with a bright blue background (see Appendix D for screenshots). The interfaces which offered the low task-relevant cues offered an enjoyable experience to the users, whereas in the case where low task-relevant cues were not present, interacting with the interfaces was not enjoyable.

4.6 Experimental Task

The goal of this research endeavor was to examine the influence of low and high task-relevant cues on online impulse buying. One eminent concern was that subjects would rush through the purchase process without determining the presence of these cues. If that happened, their responses to the interfaces will not necessarily be the result of the absence or the presence of the low and high task-relevant cues. For example, since this was only an experiment, the subjects will not be concerned to evaluate the security of the interface. To address this problem, subjects were given a list of tasks that they had to perform to assess the website (see Appendix E). Since different features were available on different websites, four different versions of the task sheet were created to match the available features. However, the process of going through the website was the same in each version.

Since the subjects were being forced into a pattern of actions, the experimental task can be criticized for not being realistic. However, a tradeoff had to be made between realism and

precision. Dennis and Valacich (2001) suggest that when faced with dilemmas in experimental research, "it is important to sacrifice realism and generalizability for precision because precision is the raison d'être of experimental research" (p. 13). Therefore, precision was chosen over realism and generalizability. Through precision, the researcher can ascertain that the changes in the dependent variables are due to the manipulation of the independent variables and not, due to other extraneous variables (Stone 1978).

4.7 Variables

An important element in the research process is to determine which measures to use to capture the different constructs in the research model. These constructs cannot be measured directly and consequently, appropriate surrogates should be chosen to represent them (Straub 1989). The robustness of the findings relies on the "goodness" of the measures at conceptualizing the constructs in the research model (Cook and Campbell 1979). The use of flawed measures will undeniably lead to the formation of erroneous conclusions (Straub 1989). For that reason, it has been suggested that validated measures should be used wherever possible (Straub 1989). The use of existing instruments is considered as a sound methodological approach (Boudreau et al. 2001). Furthermore, it has been recommended that information systems researchers should use constructs which have been well established in the reference disciplines (Straub 1989).

For these reasons, existing measures were used to operationalize the constructs in the proposed research model. A number of variables were identified to test the research hypotheses, including four independent variables (presence of high task-relevant cues, presence of low task-

relevant cues, security, and visual appeal) and four dependent variables (perceived usefulness, perceived enjoyment, approach/avoidance behaviors, and impulse buying behavior). Additionally, four variables were needed to verify the strength of the manipulations. A summary of each of the variables used in this study is provided in Table 4.6 and in the next subsections, a description of each is provided.

Table 4.6: Variables Used

Variables Used
Independent Variables
• *HTR*: categorical variable indicating the presence or absence of the high task-relevant cues.
• *LTR*: categorical variable indicating the presence or absence of the low task-relevant cues.
• *Security perception*: continuous variable capturing the subjective beliefs that the web retailer will protect the privacy and security of the consumer's information.
• *Visual appeal*: continuous variable capturing the aesthetics of the interface.
Dependent Variables
• *Perceived usefulness*: continuous variable that measures the extent to which consumers believe that their shopping productivity will be increased by using a particular website.
• *Perceived enjoyment*: continuous variable that is a metric of the experience an online user has when interacting with a particular website.
• *Approach/avoidance behavior*: continuous variable that captures any positive actions directed toward the website, such as exploration of online offerings of a website.
• *Impulse buying behavior*: continuous variable that measures the impulsiveness of the respondents.
Variables used for manipulation checks
• *Functional fit-to-task*: continuous variable that measures the extent to which a particular website meets the user needs and improves his or her performance as an online shopper.
• *Ease of navigation*: continuous variable that measures the extent to which navigating a website is perceived to be free of effort.
• *Systems interface*: continuous variable that captures the pleasantness of the interface.
• *Visual appeal*: continuous variable capturing the aesthetics of the interface.
• *Security perception*: continuous variable capturing the subjective beliefs that the web retailer will protect the privacy and security of the consumer's information.
• *Download delay*: continuous variable that captures the subject's perceptions of the time it takes to get a response from a website after a request or interaction with it.

4.7.1 Independent Variables

As indicated above, four independent variables were used in this research. HTR was a

categorical variable (0 or 1) which indicated the presence or absence of the high task-relevant

cues. A score of 0 meant that the high task-relevant cues were absent, while a score of 1 meant

that these cues were present. Similarly, LTR indicated the absence or presence of low task-

relevant cues based on a score of 0 or 1 respectively. More information about the two other

independent variables is provided next. These two independent variables were chosen as they

were better representatives of the low and high task-relevant cues as will be evidenced in the

manipulation checks in the next chapter. For both variables, a 9-point Likert-type scale anchored

by 1 (Strongly Disagree) and 9 (Strongly Agree) was used.

4.7.1.1 Security Perceptions

Security perceptions are conceptualized as the subjects' subjective beliefs that "their

private information will not be viewed, stored, and manipulated during transit and storage by

inappropriate parties in a manner consistent with their confident expectations" (Pavlou 2001, p.

818). The measure used was from Cheung and Lee (2000) and consisted of four items (see Table

4.7).

Table 4.7: Items for the Independent Variables

Construct	Items
Security Perceptions	I am confident that the information I provide during my transaction will not reach inappropriate parties during storage in this retailer's databases
	I believe inappropriate parties cannot deliberately observe the information I provide during my transaction with this web retailer during transmission.
	In my opinion, inappropriate parties will not collect and store the information I provide during my transaction with this web retailer.
	Overall, I have confidence in the security of my transaction with this web retailer.
Visual Appeal	The website is visually pleasing.
	The website displays visually pleasing design.
	The website is visually appealing.

The different items asked the subjects whether they believed that the information they provided at the website will be transmitted securely and stored properly. Researchers who have used this measure have reported acceptable reliabilities (e.g., Pavlou 2001).

4.7.1.2 Visual Appeal

Visual appeal captures the extent to which the subjects believe that the website is aesthetically pleasing. The measure used for this construct was from Loiacono and colleagues' (2002) work in developing the WebQual instrument. This construct consists of three items which ask the subjects whether they believed that the site was visually pleasing (see Table 4.7). When developing this instrument, Loiacono and colleagues (2002) went through a stringent process of assessing the validity and reliability of the construct, and the resulting measure is highly reliable and valid.

4.7.2 Dependent Variables

The dependent variables used include perceived usefulness, perceived enjoyment, approach/avoidance behaviors, and impulse buying behavior. Each is described next.

4.7.2.1 Perceived Usefulness

In the context of e-commerce, the usefulness of a website as a shopping medium relates to the extent to which consumers believe that their shopping productivity will be increased by using the particular website (Koufaris 2002). Perceived usefulness was measured using four items that were adapted from Davis (1989) and Davis et al. (1989) (see Table 4.8). Since the items within this construct were altered, it is imperative to revalidate the construct's validity and reliability (Straub 1989). This requirement is duly noted and will be addressed in the next

chapter. Perceived usefulness was measured using a 9-point Likert-type scale anchored by 1 (Strongly Disagree) and 9 (Strongly Agree).

Table 4.8: Items for the Dependent Variables

Construct	Items
Perceived Usefulness	Using this website can improve my shopping performance.
	Using this website can increase my shopping productivity.
	Using this website can increase my shopping effectiveness.
	I find using this website useful.
Perceived Enjoyment	My interaction with this website was enjoyable.
	My interaction with this website was exciting.
	My interaction with this website was pleasant.
	My interaction with this website was interesting.
Approach/ Avoidance Behaviors	How much time would you like to spend with this website? Very Little/A Lot
	Once at the site, how much did you enjoy exploring around? Very Little/A Lot
	How much would you like to either approach or avoid this particular site while shopping? Avoid/Approach
	How much would you avoid looking around or exploring this site? Avoid/Approach

4.7.2.2 Perceived Enjoyment

In pilot tests, the pleasure, arousal, and dominance (PAD) dimension proposed by Mehrabian and Russell (1974) was used to capture the affective reactions to the website. This dimension consists of twelve semantic differential items, with 5 items for pleasure, 4 items for arousal, and 3 items for dominance. However, these items did not load well together and the dominance subdimension had to be dropped altogether (see Appendix B). This is consistent with the results from several studies carried out in environmental psychology (e.g., Eroglu et al. 2003). While the resulting measure (i.e., excluding the dominance dimension) is parsimonious and easy to use, it does not fully capture the gamut of possible emotional reactions (Eroglu et al. 2001; Machleit and Eroglu 2000). Consequently, it has been suggested that researchers should use internal states that are "hypothesized to be relevant in their specific research context" (Eroglu

et al. 2001, p. 181). Therefore, perceived enjoyment, a measure developed and used in the information systems field, is used to capture the emotional reactions that are experienced when the web user interacts with the website.

In the context of e-commerce, perceived enjoyment is a metric of the experience an online user has when interacting with the website (Sanchéz-Franco and Roldán 2005). The measure used was adapted from Chang and Cheung (2001). The original measure used a four-item semantic differential scale, asking the respondents whether they felt using the Internet/WWW was enjoyable/disgusting, dull/exciting, pleasant/unpleasant, and interesting/boring.

Since most of the measures in this study used a 9-point Likert-type scale anchored by 1 (Strongly Disagree) and 9 (Strongly Agree), this measure was adapted so that the same scale could be used to maintain consistency in the questionnaire. Thus, the positive anchor of the semantic differential scale was used and the subjects were asked whether they felt using the website was enjoyable, exciting, pleasant, and interesting (see Table 4.8). The reliability and validity of this adapted construct will be assessed in the next chapter.

4.7.2.3 Approach/Avoidance Behaviors

Approach behaviors are any positive actions directed toward the environment, such as intention to play, explore, and affiliate, while avoidance behaviors are the exact opposite (Mehrabian and Russell 1974). The measure was adapted from the original work by Mehrabian and Russell (1974) to reflect the interaction with the website. The measure consisted of four semantic differential items on a 9-point fully anchored scale (see Table 4.8). The items within

this construct measured the extent to which the subjects enjoyed staying at and exploring the website, as well as the likelihood that they would return to the website in the future.

4.7.2.4 Impulse Buying Behavior

Consistent with past empirical research on impulse buying, a one-item measure was used for the impulse buying behavior (Rook and Fisher 1995). This measure forces the respondents to choose a behavior that a consumer described in an imaginary shopping situation should perform. The assumption is that the impulsive buyers in the sample will project themselves in the scenario and will be the ones choosing the most impulse alternative (Rook 1987). In the initial work by Rook and Fisher (1995), the scenario described an individual in a shopping environment who had to make a choice between certain items of clothing.

In this study, the scenario had to be adapted to the context of e-commerce as well as the purchase of a tote bag with its accessories. The following scenario was therefore used to stimulate the impulse buying behavior:

"Mary is a 21-year old college student with a part-time job. She owns an older

bag that is a little worn and isn't exactly the latest style. She has recently bought

a new cell phone and is considering the purchase of a cell phone holster that she

can use along with the bag. She plans to spend no more than $15 for the purchase

of this new accessory, but she feels she has enough money to splurge a little if she

finds something she really likes. After work, she decides to browse the Internet to

purchase the holster. As she was browsing the website, Mary sees a great looking

bag, which is on sale for $60 and falls in love with it on first sight. Also, she

wouldn't mind finding something that would conveniently store her iPod device."

After reading this scenario, the subjects were presented with five purchase decision alternatives. From low to high impulsiveness, these alternatives were: buying the cell phone holster only; buying the holster only and wanting the new bag; buying the new bag instead of the holster; buying both the holster and the new bag; and buying the new bag, a matching holster, and a iPod case. Thus, a 5-point Likert-type scale was used for this measure.

The use of a female consumer as the imaginary person in the scenario can confound the results because of gender effects. The researcher's intention in an experiment is to increase precision to ascertain that the changes in the dependent variables are due to the manipulation of the independent variables and not, due to other extraneous variables (Stone 1978). For that reason, it was imperative to control for any gender effects. To address this issue, half of the sample was presented with the scenario with the female consumer, Mary, and the other half viewed a scenario with a male consumer, Bob. To verify for any gender effects, a univariate analysis of variance was conducted using the gender of the person in the scenario as the independent variable. An analysis of the results indicates that there were no significant gender effects at the 0.05 significance level ($F(1,214) = 0.456$, $p = 0.5$). Consequently, the data from the two different conditions were merged.

4.7.2.4.1 The Use of Scenarios

The use of scenarios in experimental settings, which is based on the role-playing approach (Wirtz and Kum 2001), has been extensively used in marketing research, especially in

services marketing research (e.g., Dabholkar 1996), and consumer behavior research (e.g., Raghubir and Srivastava 2002). The use of scenarios as a substitute for other methods has been controversial (e.g, Surprenant and Solomon 1987), but concurrently its merits have been identified (e.g., Rook 1987). In fact, just like any other method, the use of scenarios has both advantages and disadvantages. These will be discussed in this subsection, along with any measures taken in this study to dissipate the drawbacks associated with role playing.

Researchers studying emotions in an experimental setting face a recurrent problem. It is practically impossible to obtain pure emotions in such settings (Izard 1972). Since the setting is so sterile, it is extremely difficult to design a stimulus in such a way as to get the subjects experience emotional responses. However, recently, several studies have confirmed that the use of scenarios in an experimental setting can *provoke emotional responses* (Bagozzi et al. 1999; Dholakia 2000; McCollough et al. 2000). Indeed, in the study of impulse buying, the use of scenarios has been found to lead to emotional responses (Rook and Hoch 1985), such as the urge to buy impulsively. Consequently, the subjects in the sample who tend to be impulsive will choose the alternative which entails the most impulsiveness (Rook 1987).

The use of scenarios maximizes *precision* which is vital in an experimental setting (Dennis and Valacich 2001). Through the use of role-playing, the researcher can more easily operationalize expensive or difficult manipulations, while at the same time, allowing more control over unmanageable variables (Bitner 1990). Other methods do not allow such precision. For instance, recall experiments have been used in the study of impulse buying (Rook 1987), where the subject is asked to recall the last time he or she made an impulsive purchase. However,

the subject's response may be biased because of memory lapses and the need to behave in a socially desirable manner (Smith and Bolton 1998). Similarly, it would be extremely difficult, expensive, and unethical to capture individual's behavior through observation (Smith and Bolton 1998).

The use of scenarios also *improves construct validity*, which is the extent to which the construct measures what it is supposed to (Cook and Campbell 1979). The aim of a scenario is to encourage the subject to project in the situation (Rook 1987) and determine how a certain individual should react in that particular situation. With this indirect form of questioning, the subject does not perceive that he or she is indicating how he or she would respond in that situation. Rather, it indicates how the person in the scenario should behave. Consequently, the use of scenarios reduces the likelihood of social desirability (Fisher 1993; Wirtz and Kum 2001), which is the situation where subjects respond in a way that they think is socially appropriate (Cook and Campbell 1979). Consequently, through the use of scenarios, the subjects will provide their "true" response, because they will not be judged on their behavior (Fisher 1993).

As with any research method, the use of scenarios also involves some drawbacks. The first one is that such an approach increases the likelihood of demand effects (Bitner 1990; McCollough et al. 2000; Surprenant and Solomon 1987), which is the situation where subjects behave in ways that they would never do normally (Cook and Campbell 1979). When the subjects read the scenario, they can guess the purpose of the experiment and behave accordingly to produce "good" data for the researcher. In this study, it is not believed that there were demand effects. In the introduction, the subjects were told that the purpose of the experiment was to

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determine the behavior of online consumers. They were exposed to the scenario early in the research session and the information presented did not include anything about impulsiveness. Based on the scenario, the subjects were presented with the different alternatives only at the end of the experiment. Therefore, it was difficult for them to guess that the aim of the experiment was to capture their impulsiveness based on the scenario. Through informal talks with some of the subjects after the experiment, it was confirmed that there were no demand effects, since none of them believed they were being tested on their impulsiveness.

Another potential limitation of the use of scenarios is the inability of the subjects to project themselves in the scenario and react in the way they would in a normal situation (Bitner 1990; McCollough et al. 2000). This may be partly because of the subjects' lack of involvement (Surprenant and Solomon 1987). However, it has been suggested that the scenario method is particularly successful when subjects are required to play themselves instead of acting out unfamiliar roles (Eroglu 1987). It is believed that the students did not have any problems to project themselves in the situation in the scenario for four reasons. First, the imaginary person in the scenario was in the same age group as the subjects and was also a college student. Therefore, the subjects in the study were "playing" themselves. Second, as college students, these subjects are also faced with the same monetary issues when considering what to buy. Third, it has been reported that college students are the heaviest Internet users (Pew Internet & American Life Project 2005) and thus, the act of website browsing is pertinent to the subjects. Finally, the product viewed was salient to them as evidenced on the website of a tote bag manufacturer. One of the market segments that tote bag manufacturers target is college students (Timbuk2 2005).

Therefore, these subjects did not have to play a role which is ambiguous or unfamiliar to them. Consequently, it is believed that the subjects did project themselves into the situation described in the scenario.

4.7.3 Variables for Manipulation Check

In addition to the security perceptions and visual appeal (described in the Independent Variables section), four other variables were used to verify that the manipulations worked. A 9-point Likert-type scale anchored by 1 (Strongly Disagree) and 9 (Strongly Agree) was used to capture the subjects' responses for each of these measure. Each of them is described next.

4.7.3.1 Functional Fit-to-Task

Functional fit-to-task relates to the extent to which consumers believe that their shopping performance will be increased by using the particular website (Koufaris 2002). The measure used for this construct was drawn from Loiacono and colleagues' (2002) work in developing the WebQual instrument. This construct consists of three items which asked the subjects whether the website meets their needs, improving their performance as online shoppers (see Table 4.9).

4.7.3.2 Ease of Navigation

The ease of navigation measures the extent to which navigating a website is perceived to be free of effort (Salisbury et al. 2001). The ease of navigation measure was adapted from Davis's (1989) and Davis et al.'s (1989) perceived ease of use measure and consisted of four items (see Table 4.9). Since the items within this construct were altered, it is imperative to revalidate the construct's validity and reliability (Straub 1989). This requirement will be addressed in the next chapter.

Table 4.9: Items for the Variables Used for Manipulation Checks

Construct	Items
Functional Fit-to-task	The information on the website is pretty much what I need to carry out my tasks.
	The website adequately meets my information needs.
	The information on the website is effective.
Ease of Navigation	Navigating these web pages is easy for me.
	I find that my interaction with this website is clear and understandable.
	It is easy for me to become skillful at navigating the pages of this website.
	Overall, I find these pages easy to navigate.
Systems Interface	It is pleasant to follow the overall flow of the website.
	It is pleasant to follow and use the menu structure.
	The images and typographies used in the site are stylish.
	The overall atmosphere and screen displays of the sites are well coordinated.
	It is pleasant to see the provided information on each screen of this site.
	Information provided in this website is consistent throughout.
Download Delay	When I use this website, there is very little time between my actions and the website's response.
	The website loads quickly.
	The website takes very little time to load.

Note: Security perceptions and visual appeal were also used as manipulation checks.

4.7.3.3 Systems Interface

Systems interface is the extent to which the interface is pleasant. The measure used for this construct was from Kim et al. (2002). This construct consists of six items which ask the subjects whether they liked interacting with the website (see Table 4.9). Acceptable reliability has been reported for this measure (Kim et al. 2002).

4.7.3.4 Download Delay

Download delay captures the subject's perceptions of the time it takes to get a response from a website after a request or interaction with it (Loiacono et al. 2002). The measure used for this construct was from Loiacono and colleagues' (2002) work in developing the WebQual instrument. This construct consists of three items which capture the subject's perceptions of the time it takes to get a response from a website after an interaction with it (see Table 4.9).

4.8 Procedure

Thirty-eight experimental sessions were conducted over a span of five weeks, with each day consisting of between one to four sessions with two to thirteen subjects in each session, depending on the interface being used in the session. This arrangement allowed the researcher to dissipate two threats to validity, namely history and diffusion, while simultaneously ensuring that the subjects were randomly assigned to the different sessions.

On each day, before any of the sessions started, the researcher would review the data collected so far to determine which of the groups (i.e., control or treatment) needed to be conducted that day to ensure equal number of subjects in each cell. Thus, when the subjects came to the research session, they did not know which group they would be assigned to. One hundred and sixty-two subjects participated in the treatment groups and fifty-four subjects were in the control group. Because of the manipulation of download delay as a feature of structural firmness, the number of people in a research session for interfaces v1 and v2 ranged from two to eight, while for interfaces v3 and v4, the number ranged from three to seventeen. Thirty-eight sessions were scheduled over a five-week period (see Appendix C for the schedule). This arrangement compensated for the threat of history. Each experiment session was about twenty-five minutes long, with about five minutes between each session to prepare the laboratory, if necessary, and to control traffic between the sessions.

To control for any confounds, the principal researcher conducted all the research sessions. Similarly, all the sessions were carried out in the same computer laboratory which contained forty-five separate workstations. In one research session, only one research treatment

was used. Since the number of people in each session was less than seventeen, the subjects could be dispersed throughout the room. In this way, the subjects could not see each other's screen and could not talk to each other, which dissipated the threat of diffusion.

To ensure that the randomization process was valid, there should be no significant differences across the different groups. As explained in the Sample section, univariate analyzes of variances indicated that there were no significant differences at the 0.05 significance level among the groups in terms of gender, age, and their experience as online shoppers. Based on these results, it was concluded that the randomization process was appropriate.

Upon arriving at the experimental session, subjects were evenly dispersed throughout the computer laboratory. Each participant had access to one computer, which was used for interacting with the experimental interface, depending on which treatment group he or she was assigned to, and the administration of all measures. The subjects were first instructed to use their user name and password to log into their respective computer. The principal researcher then introduced herself and informed the subjects of the experiment's objective, which is to study how consumers behave in an online context. They were given specific instructions about the study. They were also informed that they would need a pen or pencil during the session and if they did not bring one, a pencil was provided to them. Next, the subjects were given the experimental material which was a document consisting of the uniform resource locator (URL) for a short background questionnaire, the scenario, the URL for the experimental stimulus (depending on the group the subject was assigned to), the task list, and the URL for the post-experimental questionnaire (see Appendix F).

To control for any confounds, a formal written script was followed (see Appendix G). The researcher rehearsed and thoroughly memorized this script prior to the sessions to ensure that the same information was given to the subjects. Similarly, the experimental material, which included the URL for a short background questionnaire, the scenario, the URL for the experimental stimulus, the task list, and the URL for the post-experimental questionnaire, was given in a written format to ensure that the appropriate information was presented to the subjects in the different situations. Furthermore, the subjects went through the same list of tasks.

Following the introduction and instructions, each subject went to the first website, where they "signed" the consent form by entering their student identification number, before completing the short background questionnaire (see Appendix H). After closing this first website, they read the scenario prior to assessing the website based on the list of tasks provided. Next, they completed the post-experimental questionnaire, which consisted of the independent variables, the dependent variables, and the measures for the manipulation check (see Appendix I). At the end of each research session, the researcher collected the documents from the subjects, thanked them for their participation, and reminded them that they should not divulge any information about the study to their class mates.

4.9 Summary

This chapter provided the justification for the proposed research methodology as well as the description of a study that was used to test the proposed hypotheses. A laboratory experiment was considered as the most appropriate method for this research endeavor. In this chapter, a comprehensive description of the research study is provided, including information about the

research design used, the sample, the interfaces used, the task performed, the variables used, and

the procedure.

The next step in the research process involves analyzing the data to confirm or disconfirm

the hypotheses. In the next chapter, the statistical techniques used to test the hypotheses are

discussed. Based on these analyzes, detailed descriptions of the results are also provided.

CHAPTER 5

ANALYSIS TECHNIQUES AND RESULTS

The next step in the research process involves analyzing the data to confirm or disconfirm the hypotheses. This chapter provides a detailed description of the data analysis techniques used to test the hypotheses and the results. The first section presents the manipulation checks, which were conducted to test whether the manipulations of the independent variables had the intended effect. The second section covers the results of a preliminary data analysis, based on the descriptive statistics. In the penultimate section, the chosen data analysis techniques are described. The chapter concludes with the results of hypothesis testing.

5.1 Manipulation Checks

Before testing the hypotheses, it is essential to verify that the manipulations of the independent variables on the interfaces were successful. The presence of the low and high task-relevant cues was manipulated through the features of functional convenience, representational delight, and structural firmness. The subjects were exposed to one of four interfaces: one which contained neither the high task-relevant cues nor the low task-relevant ones (v1), the second included only the low task-relevant cues (v2), the third one only contained the high task-relevant cues (v3), and finally, the last one contained both the low and high task-relevant cues (v4).

Based on a literature review, the two features that have been considered to be most important in each of these categories were identified (see Chapter 3). These particular features were chosen based on the attention they have received from information systems researchers. For instance, for structural firmness, security, which has been considered as the top priority for web

users (Zhang and Von Dran 2001-2002), has been studied extensively. A small description of each measure along with its source is presented in Table 5.1. A 9-point Likert-type scale was used to capture the subjects' perceptions.

Table 5.1: Measures Used for Manipulation Check

Category	Measures	Description	Source
Structural Firmness	Security Perceptions	Belief that their private information will not be viewed, stored, and manipulated during transit and storage by inappropriate parties in a manner consistent with their confident expectations	Chang and Cheung 2001
	Download Delay	Perception of the time it takes to get a response from a website after a request or interaction with it.	Loiacono et al. 2002
Functional Convenience	Functional Fit-to-Task	Extent to which the particular website meets the consumer's task needs and improves their performance.	Loiacono et al. 2002
	Ease of Navigation	Extent to which navigating a website is perceived to be free of effort.	Salisbury et al. 2001
Representational Delight	Systems Interface	Extent to which interacting with the website is pleasant	Kim et al. 2002
	Visual Appeal	Extent to which the subjects believe that the website is aesthetically pleasing	Loiacono et al. 2002

The means for each of these measures are depicted in Figure 5.1.

Figure 5.1: Means for Manipulation Check

	SF1	SF2	FC1	FC2	RD1	RD2
v1	3.38	4.53	6.73	5.55	4.06	3.13
v2	4.06	5.23	7.09	6.01	6.17	6.23
v3	6.39	8.11	7.47	6.54	5.41	4.39
v4	6.90	7.98	8.32	7.57	7.45	7.51

SF1: Security Perceptions
SF2: Download Delay
FC1: Functional Fit-to-Task
FC2: Ease of Navigation
RD1: Systems Interface
RD2: Visual Appeal
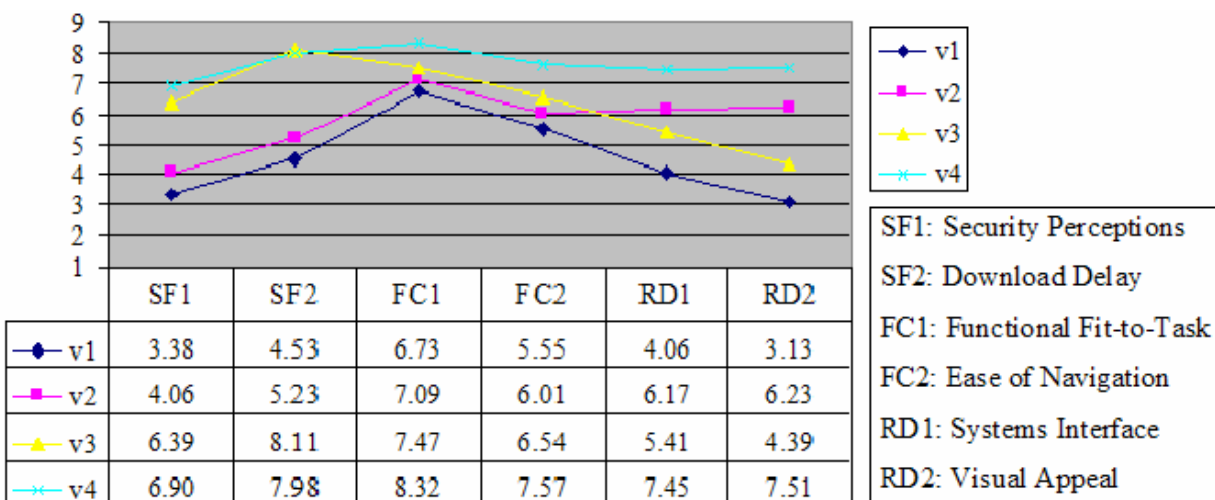
At a first glance, the figure reveals that these features differed across the four different

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interfaces. Furthermore, consistent with the manipulation check conducted in the pilot test, the manipulations of structural firmness and representational delight were more effective than that of functional convenience. To maintain the realism of the different interfaces, the manipulation of functional convenience was not strengthened. To confirm the manipulation of these features across the different interfaces, separate univariate analyses of variance were performed. The results of these analyzes are depicted in Table 5.2.

Table 5.2: Results of Univariate Analyses of Variance

Categories	Features	F-value	P
Structural firmness	Security Perceptions	35.67	< 0.001
	Download Delay	52.84	< 0.001
Functional convenience	Functional Fit-to-Task	8.59	< 0.001
	Ease of Navigation	9.11	< 0.001
Representational delight	Systems Interface	28.11	< 0.001
	Visual appeal	43.26	< 0.001

After analyzing these results, it can be concluded that the manipulation of the features were valid at the $\alpha = 0.01$ level. As expected, the respondents perceived the manipulations of these features on the different interfaces.

5.2 Preliminary Data Analysis

The means and standard deviations of the different dependent variables are depicted in Table 5.3. Except for the impulsive buying behavior, where a scale of 1 to 5 was used, the other measures were based on a 9-point scale ranging from 1 (Strongly Disagree) to 9 (Strongly Agree).

An analysis of the means for perceived usefulness was conducted first. As expected, the interfaces that did not contain the high task-relevant cues were not perceived as being useful,

evidenced by the smaller means for interfaces v1 and v2. The presence of the high task-relevant cues caused an increase in the means, as evidenced by the magnitude of the means for interfaces v3 and v4. Interestingly, the presence of low task-relevant cues increased the perception of usefulness. Since both v1 and v2 did not contain the high task-relevant cues, it was expected that the means will be closely aligned. The same was expected for the means for v3 and v4. This interactive effect of low and high task-relevant cues will have to be studied further.

Table 5.3: Descriptive Statistics

Variable	Interface	N	Mean	SD
Perceived Usefulness	v1	54	4.66	2.12
	v2	54	5.34	2.14
	v3	54	5.69	2.45
	v4	54	7.07	1.75
Perceived Enjoyment	v1	54	3.68	1.67
	v2	54	5.46	1.98
	v3	54	5.00	2.21
	v4	54	6.81	1.81
Approach/Avoidance Behaviors	v1	54	3.02	1.68
	v2	54	4.14	1.93
	v3	54	4.19	2.05
	v4	54	5.98	1.70
Impulse Purchase Behavior	v1	54	2.24	1.37
	v2	54	2.89	1.56
	v3	54	3.06	1.55
	v4	54	3.85	1.20

The subjects did not enjoy interacting with the interfaces that did not contain the low task-relevant cues as expected. The presence of these cues on interfaces v2 and v4 increased the enjoyment experienced. However, since both the control interface (i.e., v1) and interface v3 did not include the low task-relevant cues, it was expected that the means will be quite similar. The same was expected for the means for v3 and v5, since both contained the low task-relevant cues.

However, the subjects enjoyed interacting with interface v3 as much as they did with interface v2. The presence of the high task-relevant cues increased the enjoyment derived from interacting with the website. The same interactive effect of the low and high task-relevant cues as observed with perceived usefulness is evident with perceived enjoyment and should be investigated further.

When analyzing the means for approach/avoidance behaviors, it can be concluded that the subjects would not approach a website which did not contain the low and high task-relevant cues. They do not perceived such websites to be useful or enjoyable and therefore, would prefer to avoid them. The presence of only the low task-relevant cues or high task-relevant ones did not change this behavior by much. However, subjects will exhibit approach behaviors when exposed to interfaces containing both these categories of cues.

The same trend was observed for the impulsive buying behavior. The impulsive buying behavior was lowest with the control interface. The addition of either the low task-relevant cues or the high task-relevant cues did not change the means considerably. However, with the presence of both types of cues, there was a remarkable increase in the means. This provides preliminary support for the proposition that both low and high task-relevant cues are essential for online impulse buying.

The results of this preliminary data analysis are promising. These results further support the findings from the manipulation check. There were differences in the dependent variables based on the manipulation of the independent variables. From these results, the interactive effect of the low and high task-relevant cues on perceived usefulness and perceived enjoyment was

apparent. In the next section, the techniques used for the data analysis will be described.

5.3 Choosing a Data Analysis Technique

In social science research, the constructs used cannot be measured or observed directly (Straub 1989). For instance, it is impossible to measure a subject's emotional state just by watching him or her. Instead, the researcher indirectly measures these variables, usually through the use of self-reported measures (Nunnally and Bernstein 1994). For instance, with measures such as the PAD dimension (Mehrabian and Russell 1974), the subject is asked how happy, satisfied, or excited he or she is. As a consequence, the subject's response consists of the observed score in addition to measurement errors (Nunnally and Bernstein 1994), which are inconsistencies produced by the instruments used (Wimmer and Dominick 2000). Therefore, when the social science researcher contemplates the choice of a data analysis technique, it is imperative that the technique chosen takes into account this measurement error.

5.3.1 Available Data Analysis Techniques

Approaches to data analysis can be broadly classified as first generation and second generation data analysis techniques. The *first generation techniques* include linear regression, univariate analysis of variance, and multivariance analysis of variance (Gefen et al. 2000). Conversely, the *second generation data analysis techniques* include structural equation modeling (SEM) techniques, such as LISREL and partial least squares (PLS) (Bagozzi and Fornell 1982). SEM is favored over the first generation data analysis techniques for two main reasons, namely measurement precision and simultaneous analysis that are provided by these techniques.

The major criticism against the first generation data analysis techniques is that they

assume that the variables being studied are perfectly measured, which is practically impossible due to the use of indirectly measured constructs. When using such techniques, the measurement error is assumed to be non-existent and consequently, these techniques are imprecise, producing inaccurate results (Byrne 2001). In contrast, the second generation data analysis techniques do not assume perfect measurement of the variables under investigation. Instead, an analysis of the measurement errors associated with the variables is a vital part of the testing of the proposed research model (Gefen et al. 2000). Consequently, SEM tools provide a "more rigorous analysis of the proposed research model" (Gefen et al. 2000, p. 5). In fact, recently, many researchers have advocated that SEM provides the most powerful technique that provides *measurement precision* (e.g., Chin et al. 1997; Gefen et al. 2000; Segars and Grover 1993)*.

Testing a research model using the first generation data analysis techniques requires two separate analyses to be conducted (Gefen et al. 2000). In the first step, using factor analysis, the researcher investigates how the different items load on the construct. In a subsequent step, the relationships between the different constructs are examined. In contrast, SEM allows the researcher to "answer a set of interrelated research questions in a single, systematic, and comprehensive analysis" (Gefen et al. 2000, p. 3). Consequently, with SEM, factor analysis and hypothesis testing can be accomplished in the same analysis. This *simultaneous analysis* provides the researcher with richer information about the extent to which the data supports the research model than is possible with the first generation data analysis techniques.

5.3.2 Justification for the Choice of the Data Analysis Technique

As indicated above, the second generation data analysis techniques allow better

measurement precision as well as a simultaneous analysis of the psychometric properties of the constructs and the relationships between the constructs. Moreover, since its introduction to the information systems literature in 1990, there has been a sturdy growth in the use of SEM. In fact, the use of these techniques for validating instruments and testing the relationships between constructs has become "de rigueur" in this field (Gefen et al. 2000, p. 6). For these reasons, the SEM approach is considered as the tool for data analysis in this research endeavor.

5.4 Structural Equation Modeling

SEM is a statistical technique that adopts a confirmatory approach to the testing of a research model (Byrne 2001). The term *structural equation modeling* implies two important aspects of this technique. First, the relationships between the different constructs are represented by a series of regression equations (Byrne 2001). Second, these relationships are "modeled pictorially to enable a clearer conceptualization of the theory under study" (Byrne 2001, p. 3). Consequently, a more complete picture of the entire research model is presented and tested (Gefen et al. 2000). SEM techniques are favored over other data analysis techniques because they allow the modeling of relationships among several independent and dependent variables (Gerbing and Anderson 1988).

Two types of variables are important in the SEM model, namely the latent variable and the observed variables (Byrne 2001). In social science research, the constructs used cannot be measured or observed directly (Straub 1989). These abstract constructs are known as *latent variables*. The researcher indirectly measures these variables through the use of self-reported measures. These scores from the self-report responses represent these underlying constructs.

These measured scores are known as the *observed or manifest variables*.

5.4.1 The SEM Model

SEM allows factor analysis and hypothesis testing to be accomplished at the same time (Gefen et al. 2000). Hence, the SEM model consists of two submodels – the measurement model and the structural model, as depicted in Figure 5.2.

Figure 5.2: The Two SubModels within the SEM Model
(From Byrne 2001)
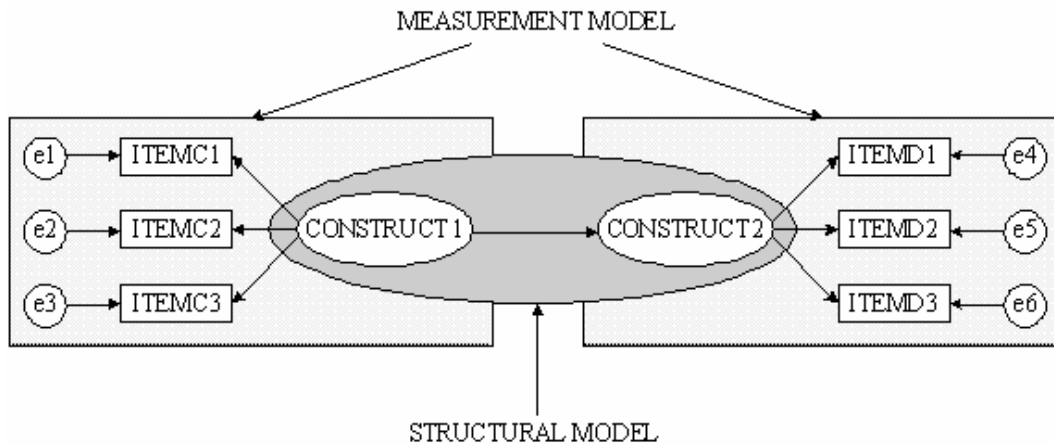
5.4.1.1 The Measurement Model

With the measurement model, the researcher defines the latent variables used in the model and assigns observed variables to each of them (Gefen et al. 2000). In other words, the measurement model provides the link between self-report scores and the underlying constructs they measure (Byrne 2001). Thus, the measurement model specifies the latent variables under study and their associated observed variables, as well as the theoretical relationships underlying the construct. It is similar to a confirmatory factor analysis since the researcher specifies which factors will load on which constructs a priori and the assessment of the measurement model determines the extent to which the observed variables load on the latent variables (Byrne 2001).

5.4.1.2 The Structural Model

With the structural model, the researcher defines relationships between the latent variables used in the model (Gefen et al. 2000). More specifically, it explains how certain latent variables in the research model directly or indirectly influence other latent variables in the model (Byrne 2001). Thus, the structural model allows hypothesis testing by assessing the hypothesized relationships between the independent and dependent variables. In the structural model, the measurement error for each latent variable is also determined.

5.4.2 Two SEM Techniques

Two distinct SEM techniques are available, namely covariance-based SEM and partial-least-squares-based SEM. Covariance-based SEM technique is used in software packages, such as AMOS, EQS, and LISREL, while software packages, such as PLS-Graph, use partial-least-squares-based SEM (Gefen et al. 2000). The standard terminology used is rather confusing. Although both techniques are different ways to model structural equations, the covariance-based approach is usually simply referred to as "SEM" or "structural equation model", while partial-least-squares-based SEM is called PLS. In this research, this standard jargon is used to distinguish between these two techniques. These two techniques will be discussed in the next subsections.

5.4.2.1 Covariance-Based SEM

SEM works better for theory testing (Chin and Newsted 1999). The researcher defines the model with well-established constructs and confirms the theoretical model based on the data collected from a particular sample (Gefen et al. 2000). SEM requires that the data should be

normally distributed to determine the relationships between the different variables (Chin and Newsted 1999). Another important consideration when using SEM is the sample size. SEM requires a large sample and the recommendation is to have at least 100 (Hair et al. 1998) or 150 (Bollen 1989) cases. This is because the most important fit statistic used to test the model fit, known as the chi-square (χ^2) statistic, is sensitive to sample size (Bollen 1989; Hair et al. 1998). Unlike PLS, SEM allows the assessment of unidimensionality, which is the degree to which items load only on their respective construct (Segars 1997). This assessment cannot be performed with conventional techniques, such as factor analysis or through the determination of the reliability of the construct (Gerbing and Anderson 1988; Segars 1997).

The aim of SEM is to confirm the research model based on the provided data (Bollen 1989). The goodness of fit is determined using the maximum likelihood method, which evaluates the patterns that should be observed in the population covariance matrix given the model against the covariation matrix that was actually observed in the sample data (Bollen 1989). The null hypothesis is that the population covariance matrix (Σ) equals the observed covariance matrix ($\Sigma(\Theta)$).

$$H_0: \Sigma - \Sigma(\Theta)$$

An insignificant difference between Σ and $\Sigma(\Theta)$ indicates that the specified model fits the sample data. Thus, when using SEM, the aim is to accept the null hypothesis in order to confirm that the specified model fits the data.

There are many fit statistics that can be used to test the goodness of fit. AMOS, which is a software package that uses covariance-based SEM, provides 24 of them. Analyzing all of them

is quite cumbersome and therefore, the most salient fit statistics in the relevant research discipline should be used. Gefen and colleagues (2000) proposed that four goodness of fit measures should be reported in the information systems discipline. These include χ^2 to degrees of freedom ratio, the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), and the normed fit index (NFI). In addition to these fit statistics, Byrne (2001) promotes the use of the root mean square error of approximation (RMSEA).

The use of several fit statistics offers two distinct advantages. First, the interpretation of the fit of the model becomes more accurate and reliable via the use of multiple statistics. For instance, since the χ^2 statistic is sensitive to sample size, using this statistic alone to assess model fit is problematic. Using the χ^2 statistic along with these other techniques gives a better indication of the model fit. Second, the use of several fit statistics ensures a thorough analysis, as the model is assessed based on different criteria. In this study, if these fit statistics comply to the conventions in the discipline, it can be concluded that the data very closely matches the hypothesized model. Each of these fit indices is described next.

5.4.2.1.1 χ^2 Statistic

When using SEM, the aim is to accept the null hypothesis (H_0: Σ - $\Sigma(\Theta)$) to confirm that the specified model fits the data (Bollen 1989). This hypothesis is equivalent to the hypothesis that tests Σ - $\Sigma(\Theta)$ = 0 (Byrne 2001). The most important goodness of fit statistic, χ^2 statistic, tests this difference between Σ and $\Sigma(\Theta)$ (Bollen 1989). For model fit, this difference should be zero. It is recommended that χ^2 should be insignificant at the α = 0.05 level, as insignificant difference between Σ and $\Sigma(\Theta)$ indicates that the specified model fits the sample data.

This statistic is very sensitive to sample size. To obtain precise parameter estimates, it is suggested that a large sample should be used. However, when the sample is large, the χ^2 test will indicate that the difference between Σ and $\Sigma(\Theta)$ is significant (Jöreskog and Sörbom 1989). Concurrently, to obtain the desired insignificant difference, a small sample should be used. But, with a smaller sample, the estimated parameters may not be stable. It has been suggested that along with the χ^2 statistic, other goodness of fit measures should be considered.

5.4.2.1.2 χ^2 to degrees of freedom ratio

χ^2 to degrees of freedom ratio has been proposed to address the limitation of the χ^2 statistic (Wheaton et al. 1977). This ratio takes into account the number of estimated parameters in the model. Thus, this ratio is more trustworthy than χ^2 alone as it takes the degrees of freedom into consideration. In the information systems literature, it has been suggested that the χ^2 to degrees of freedom ratio should be as small as possible (Segars and Grover 1993). The accepted norm is that this ratio should be smaller than 3:1 (Chin and Todd 1995).

5.4.2.1.3 Goodness Fit Index and Adjusted Goodness Fit Index

The GFI measures the absolute fit of the combined measurement and structural model (Gefen et al. 2000). It can be considered as a measure of the proportion of variance and covariance that the proposed model is able to explain (Raykov and Marcoulides 2000). The AGFI differs from the GFI since it adjusts for the number of degrees of freedom in the defined model (Byrne 2001). The AGFI includes a penalty for using complex models since it accounts for unnecessary parameters in the model (Byrne 2001). For that reason, the AGFI is usually less than the GFI. Both the GFI and the AGFI can be considered as absolute fit indices as they

compare the hypothesized model with no model at all (Byrne 2001). Both indices range between 0 and 1, where 1 indicates perfect fit. Thus, for well-fitted models, the GFI and AGFI should be fairly close to 1, with the GFI being more than 0.90 and the AGFI being more than 0.80.

5.4.2.1.4 Normed Fit Index

The NFI uses the χ^2 statistic. More specifically, it measures the normed difference in χ^2 between a null model and the hypothesized model, as follows.

$$NFI = \frac{T_0 - T_1}{T_0}$$

Where T_0 is the χ^2 for the null model

T_1 is the χ^2 for the hypothesized model

The null model is one where the variables are not related to each other. Therefore, the null model will not fit the data at all. Thus, for a well-fitted model, the increment of fit from the null model to the hypothesized model should be substantial. The NFI ranges from 0 to 1, where an NFI of 1 indicates perfect fit. The rule of thumb is to have an NFI which is at least 0.90. Since the NFI is based on χ^2, it is known to underestimate fit in small samples.

5.4.2.1.5 Root Mean Square Error of Approximation

The RMSEA measures the extent to which the model approximates the data. It measures the discrepancy between Σ and $\Sigma(\Theta)$ as follows:

$$RMSEA = \sqrt{\frac{T - df}{df \cdot n}}$$

Where T is the χ^2 for the hypothesized model

n is the sample size

df is the degrees of freedom

This index is popular because unlike the χ^2 statistic, it is stable even with large sample sizes. It is also more rigorous than other fit statistics since it can detect discrepancies in small samples more accurately (Byrne 2001). As shown above, the RMSEA takes the degrees of freedom into account, thus making the index sensitive to the number of estimated parameters in the model (Byrne 2001). It has been argued that the RMSEA is the most contemporary fit statistic since it takes both the sample size and the degrees of freedom into account (Byrne 2001). RMSEA values ranging from 0.08 to 0.10 indicate average fit, while those higher than 0.10 indicate poor fit (MacCallum et al. 1996). Thus, a value below 0.05 indicates a good fitting model (Byrne 2001), though in the information systems literature, a value at or lower than 0.08 is recommended (Jarvenpaa et al. 2000).

5.4.2.2 Partial-Least-Squares-Based SEM

PLS works better when the model is exploratory, rather than confirmatory (Chin and Newsted 1999). It is more appropriate in situations where the underlying theory is quite new and untested. Thus, PLS is more suitable for theory building (Gefen et al. 2000). PLS uses a non-parametric distribution-free approach that does not require the data to be normally distributed. It is also more appropriate for smaller samples, though it has been recommended that the sample should have at least ten times more data points than the number of items in the most complex construct in the model (Gefen et al. 2000).

There are two types of relationships between the latent variables and their observed variables, namely formative and reflective relationships. Since latent variables cannot be

measured directly, reflective observed variables represent these underlying constructs (Teo et al. 2003). In contrast, the formative observed variables cause the latent variable (Gefen et al. 2000). To emphasize this difference, with reflective observed variables, the arrows between the observed and latent variables point towards the observed variables, while in the case of the formative variables, the arrows point towards the latent variables. Unlike SEM, which only supports reflective observed variables, PLS supports both types of observed variables.

PLS is a more prediction-oriented approach and the objective of PLS is to maximize the variance explained by the constructs (Chin 1998). Thus, PLS has a less extensive set of statistics. The two main statistics are the assessment of R^2 and AVE, which are explained next.

5.4.2.2.1 R^2

The objective of PLS is the same as linear regression in that it also tries to maximize R^2, which is the variance accounted for by the model (Gefen et al. 2000). In addition, the R^2 values for each of the independent variables are also assessed. As with linear regression, the closer the R^2 is to 1, the more accurate the model.

5.4.2.2.2 Average Variance Extracted

AVE "attempts to measure the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement error" (Chin 1998, p. 321). It is the square root of the average variance extracted by a latent variable from its observed variables. This statistic can also be interpreted as a measure of reliability for the latent variable. The norm is that the AVE should be greater than 0.50, which means that 50% or more variance of the indicators is accounted for (Chin 1998). Furthermore, to establish discriminant validity, it

has been suggested that the AVEs of the latent variables should be greater than the square of the correlations among the latent variables (Chin 1998).

5.4.2.3 A Complementary Approach

After analyzing these two types of SEM, the next question is which one to choose. This choice largely depends on the nature of the research endeavor. If the research model is based on theory and consists of well-established constructs, a confirmatory approach is adopted, making SEM the method of choice (Gefen et al. 2000). Concurrently, if the researcher's intent is theory building since the underlying theory is relatively new and untested, PLS is more appropriate. With PLS, an exploratory approach, rather than a confirmatory is taken (Chin and Newsted 1999). Furthermore, covariance-based SEM provides better estimates and more accurate model analyzes (Bollen 1989), because it allows a more rigorous assessment of the hypothesized model.

Another alternative that is available to the researcher is to use a complementary approach. PLS was initially developed as a complement to the covariance-based SEM (Chin 1998). Consequently, it has been recently suggested that PLS can be regarded as a complementary technique to the covariance-based SEM (Chin 1998). While SEM's emphasis is on overall fit, thus being more confirmatory and model analytic, PLS emphasizes prediction and the variance in the latent variables, thus making it more data analytic (Teo et al. 2003). By using both techniques, the researcher can take advantage of both these methods, resulting in a better assessment of the research model.

Thus, for the present research endeavor, a two-stage methodology is adopted as recommended by Gerbing and Anderson (1988). The measurement model was first developed

and tested independently of the structural model. This step enables the researcher to improve the psychometric properties of the constructs. In the second step, the structural model is tested in an attempt to confirm the hypotheses. The use of the two-stage methodology provides a more rigorous analysis of the proposed research model.

Moreover, the complementary approach suggested by Chin (1998) is used. The measurement model is assessed using SEM. The structural model is then assessed using both SEM and PLS. This approach will provide rich information about the use of these two different data techniques. It is expected that the results from both techniques would converge.

5.5 The Measurement Model

To assess the measurement model, the steps proposed by Segars (1997) were used. The first step involves the development and assessment of the model, which represents the hypothesized relationship between the latent variables and their associated observed variables. In the subsequent step, the model fit is examined through the assessment of the fit indices, the factor loadings, and the modification indices. Given acceptable model fit, the penultimate step covers the assessment of factor reliability. Finally, discriminant validity is examined through the use of pairwise comparisons. AMOS 4.01 will be used as the statistical package for each of these steps. As indicated above, AMOS 4.01 supports the covariance-based SEM, implying the use of maximum likelihood estimation to generate the parameter estimates. In the next subsections, each step in the assessment of the measurement model is examined.

5.5.1 Defining and Assessing the Measurement Model

With the measurement model, the researcher defines the latent variables used in the

model and assigns observed variables to each of them (Gefen et al. 2000). In the present research model, the measurement model consisted of four latent variables, namely perceived enjoyment, perceived usefulness, approach/avoidance behaviors, and impulse buying behavior. Each of these dependent variables were depicted as a latent variable by using an ellipse as per the standard notation used (Byrne 2001). The items for each of the measures were represented as observed variable by using a rectangle. Since these observed variables are reflective, paths were drawn from the latent variable to each of its associated observed variables, representing the factor loadings. To account for measurement error, an error term was included for each observed variable, except for impulse buying. The error term was represented by a circle. A path was drawn from the error term to the observed variable. Finally, two-headed arrows were used to represent the correlations between the different latent variables. After model specification, the model estimates were calculated, using AMOS.

5.5.2 Assessing Model Fit

Several methods are available for assessing the model fit. Based on recommendations in the information systems literature, four goodness of fit measures were used, which included the χ^2 to degrees of freedom ratio, goodness of fit (GFI) index, adjusted goodness of fit (AGFI) index, and the normed fit index (NFI). Since the RMSEA is the most contemporary fit statistic (Byrne 2001), it was also used to assess the model fit. Table 5.4 depicts the five goodness of fit statistics adopted in this study, along with the rule of thumb for each of them.

The fit statistics of the measurement model are presented in Table 5.5 and the model along with the factor loadings and correlations among the latent variables are depicted in Figure

5.3.

Table 5.4: Adopted Goodness of Fit Statistics

- χ^2/df – ratios of 3:1 or less are acceptable
- *Goodness of Fit (GFI)* – values of 0.90 or higher are acceptable
- *Adjusted Goodness of Fit (AGFI)* – values of 0.80 or higher are acceptable
- *Normed Fit Index (NFI)* - values of 0.90 or higher are acceptable
- *Root Mean Square Error of Approximation (RMSEA)* - values of 0.08 or less are acceptable

Table 5.5: Fit Statistics for Measurement Model

Fit Indices	Observed Value
χ^2/df	3.34
GFI	0.87
AGFI	0.80
NFI	0.94
RMSEA	0.10

An analysis of the fit-statistics indicates that the model has poor fit. The χ^2 to degrees of freedom ratio was less than the recommended 3:1 (Chin and Todd 1995). Values of 0.90 or higher for the GFI are considered as acceptable (Gefen et al. 2000). In the measurement model, the GFI was lower than 0.90, indicating less than desirable fit. The AGFI and NFI were considered as acceptable (Gefen et al. 2000). The RMSEA observed was not acceptable, based on the recommendation of Jarvenpaa and colleagues (2000). Out of the five proposed fit indices, only two of them were considered as acceptable, which indicates that the data does not fit the hypothesized model. Given the poor fit of the model, the measurement model has to be respecified.

Figure 5.3: The Measurement Model
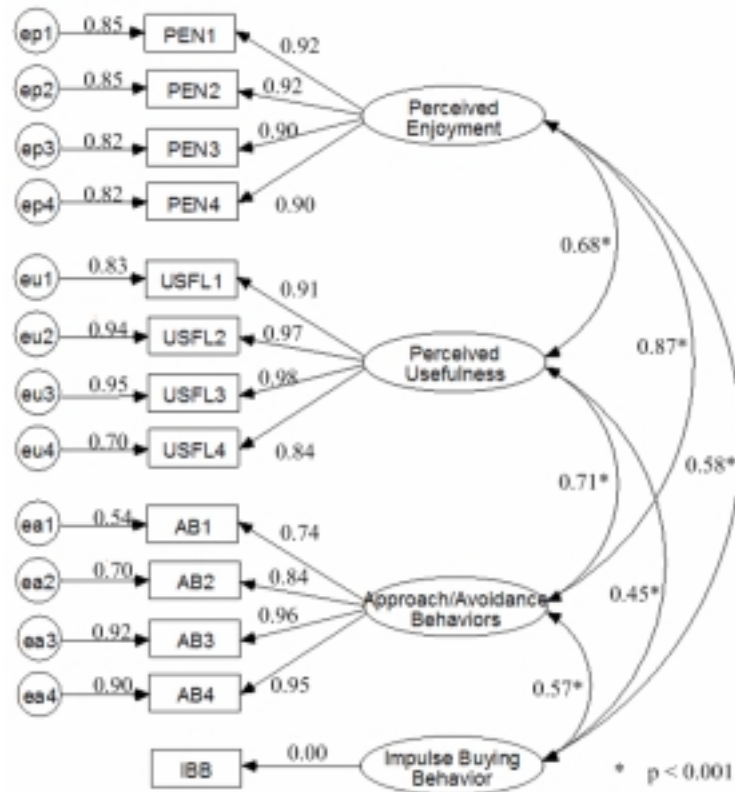
5.5.2.1 Respecifying the Measurement Model

This process is known as *specification search* and the aim of this process is to detect and correct any specification errors (Segars and Grover 1993). When the researcher decides to launch this process, he or she is no longer in confirmatory realm, but rather adopts an exploratory approach. Through this process, problematic observed variables are identified via an assessment of the factor loadings, standardized residuals, and the modification indices.

5.5.2.1.1 Examining Factor Loadings

The first criterion for eliminating problematic observed variables is an examination of the factor loadings. For convergent validity, the factor loadings should be higher than 0.707 (Segars 1997). Thus, any observed variables with factor loadings of less than 0.707 decrease the

convergent validity of the model, and should be dropped. The factor loadings in Figure 5.3 were examined to identify any problematic observed variables. However, the factor loadings ranged from 0.74 to 0.96. Hence, the measurement model has the qualities of convergent validity.

5.5.2.1.2 Examining Standardized Residuals

SEM determines the fit between a restricted covariance matrix ($\Sigma(\Theta)$), which is defined by the hypothesized model, and the sample covariance matrix (S) (Byrne 2001). The difference between the two (i.e., $\Sigma(\Theta) - S$) is captured by the residual matrix (Byrne 2001). Since these residuals are dependent on the measurement of the observed variables, they are standardized to make their interpretation easier. Thus, since the factor loadings were considered as acceptable in the previous step, the next step in the specification search involves the examination of the standardized residuals. Any standardized residuals higher than 2.58 is considered as problematic. An analysis of the standardized residual matrix depicted in Table 5.6 reveals that the standardized residuals were all smaller than 2.58 and therefore, no changes were made based on the assessment of the standardized residuals.

Table 5.6: Standardized Residuals

	IBB	AB4	AB3	AB1	AB2	USFL4	USFL3	USFL1	USFL2	PEN4	PEN3	PEN1	PEN2
IBB	0												
AB4	-0.15	0											
AB3	-0.01	0.10	0										
AB1	0.40	-0.26	-0.08	0									
AB2	0.34	-0.14	-0.21	1.13	0								
USFL4	1.13	1.50	1.91	1.16	1.67	0							
USFL3	-0.08	-0.35	0.00	-0.49	-0.32	-0.11	0						
USFL1	0.20	0.09	0.50	0.13	-0.19	0.15	-0.01	0					
USFL2	-0.14	-0.12	0.04	-0.46	-0.58	-0.06	0.03	-0.04	0				
PEN4	0.13	0.01	-0.24	0.91	1.55	1.43	-0.32	-0.33	-0.62	0			
PEN3	0.28	0.00	0.00	-0.32	0.66	2.06	0.41	0.62	0.07	-0.20	0		
PEN1	0.21	-0.16	-0.03	-0.15	0.46	2.41	-0.02	0.78	-0.08	-0.29	0.32	0	
PEN2	-0.55	-0.24	-0.27	0.35	0.97	1.94	-0.24	-0.09	-0.66	0.43	-0.23	-0.05	0

5.5.2.1.3 Examining Modification Indices

The next step involves the assessment of the modification indices. When using AMOS, a set of modification indices is generated and these indices provide an estimation of the change in χ^2 if error terms are correlated or an additional structural path is added. However, these changes cannot be made unless they are theoretically justified. For instance, it is clearly impossible to theoretically justify the correlation of two error terms from two distinct constructs. The alternative involves the deletion of observed variables from the model to improve the fit.

Since the correlations between the error terms cannot be theoretically justified, only the suggested regression paths among the observed variables are examined to find any cross-loadings. A review of the modification indices for the regression weights reveals that three of the observed variables are cross loading with the other observed and latent variables. As depicted in Table 5.7, one item of the perceived usefulness measure cross loads with three of the latent variables and nine other observed variables. Such cross-loadings indicate that the measures are not unidimensional. Thus, to improve the model fit, these three items which are indicative of cross-loadings should be dropped.

However, the researcher should be careful when dropping items, as modifying one parameter influences other parts of the model. Thus, only one modification should be made at one time (MacCallum 1986). Specification searches hence involve a recursive process of detection, respecification, and reestimation until acceptable model fit is obtained.

Table 5.7: Modification Indices

			M.I.	Par Change
AB2	<--	AB1	6.476	0.117
AB2	<--	PEN4	11.566	0.116
AB2	<--	PEN2	6.003	0.097
USFL4	<--	Approach	14.873	0.272
USFL4	<--	Enjoyment	19.319	0.218
USFL4	<--	IBB	5.139	0.145
USFL4	<--	AB4	11.771	0.139
USFL4	<--	AB3	14.458	0.151
USFL4	<--	AB1	8.558	0.149
USFL4	<--	AB2	16.125	0.173
USFL4	<--	PEN4	13.138	0.138
USFL4	<--	PEN3	13.166	0.144
USFL4	<--	PEN1	22.789	0.213
USFL4	<--	PEN2	20.993	0.201
USFL2	<--	PEN2	6.54	-0.057
PEN4	<--	AB1	5.167	0.098
PEN4	<--	AB2	6.636	0.094

5.5.2.2 Assessing the Respecified Model

As suggested by MacCallum (1986), the process of dropping these three items was accomplished in a step-by-step approach, by eliminating one observed variable at a time and assessing the respecified model. After this recursive process, the resulting respecified model was assessed. The fit statistics are depicted in Table 5.8 and the model along with the factor loadings and correlations among the latent variables are depicted in Figure 5.4.

Table 5.8: Fit Statistics for Respecified Model

Fit Indices	Observed Value
χ^2/df	1.60
GFI	0.96
AGFI	0.93
NFI	0.98
RMSEA	0.05

An analysis of the fit statistics in Table 5.8 indicates that the model fit was increased considerably by dropping these three items which were indicative of cross-loadings.

Figure 5.4: The Respecified Model
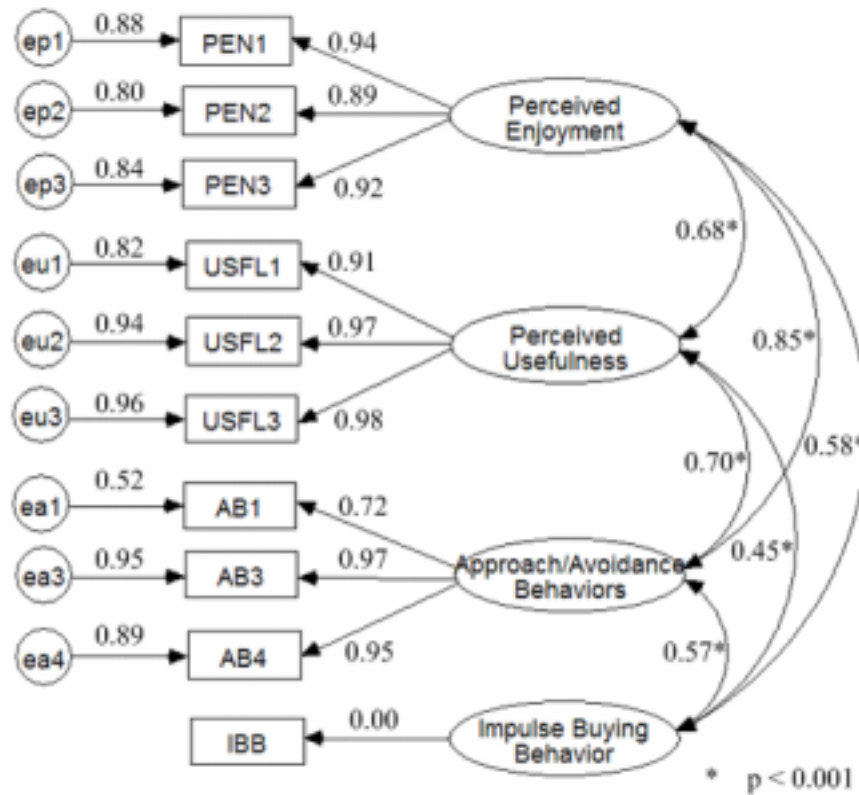
The χ^2 to degrees of freedom ratio was less than the recommended 3:1 (Chin and Todd 1995). Values of 0.90 or higher for the GFI and NFI are considered as acceptable (Gefen et al. 2000). The AGFI was above 0.80, which is considered as acceptable (Gefen et al. 2000). The RMSEA observed was acceptable, based on the recommendation of Jarvenpaa and colleagues (2000). These fit statistics imply a model that fits the data in an optimal way.

5.5.2.3 Assessing Convergent Validity

Convergent validity is the extent to which the observed variables of a latent variable correlate highly with other observed variables that represent the same latent variable (Straub et al. 2004). When using SEM, convergent validity can be assessed by examining the factor

loadings (Segars 1997). These loadings, which represent the path coefficients from the observed variables to the latent variables, should be above 0.707 for convergent validity (Chin 1998; Hair et al. 1998; Segars 1997). The factor loadings in the respecified model ranged from 0.72 to 0.98, indicating convergent validity. Moreover, the latent constructs within the model are unidimensional when the values of GFI, NFI, and AGFI are above 0.90 and the χ^2 is insignificant (Gefen et al. 2000). Hence, it can be concluded that convergent validity has been demonstrated.

5.5.3 Assessing Factor Reliability

Reliability is the extent to which the observed variables associated with a latent construct "could be, taken together, error-prone operationalizations of that construct" (Straub et al. 2004, p. 399). Gefen, Straub, and Boudreau (2000) recommend the use of the internal consistency coefficient or internal consistency reliability. Since AMOS does not generate an internal consistency coefficient, Cronbach's α is used as an acceptable surrogate to assess the reliability of the different latent variables. The Cronbach's α was calculated for each latent variable, which consist of the remaining observed variables. The recommendation is that the Cronbach's α should be above 0.70 when conducting a confirmatory factor analysis (Nunnally and Bernstein 1994). An analysis of the values in Table 5.9 indicates that the latent variables used in the research model achieved acceptable reliability.

Table 5.9: Reliability Estimates for the Latent Variables

Latent Construct	Cronbach's α
Perceived Enjoyment	0.97
Perceived Usefulness	0.95
Approach/Avoidance Behaviors	0.91

5.5.4 Assessing Discriminant Validity

Discriminant validity of a construct is the extent to which "the measurement items posited to reflect that construct differ from those that are not believed to make up the construct" (Straub et al. 2004, p. 389). Segars (1997) has suggested a way to assess the discriminant validity of constructs. It involves comparing the χ^2 of the respecified model with the four latent constructs against other measurement models with only three latent variables, where every possible pairing of the latent variables is considered. Table 5.10 depicts the χ^2 value for each of these models (refer to Appendix J for the models). Since the χ^2 in the respecified model is significantly smaller than the other models, discriminant validity is shown.

Table 5.10: Assessing Discriminant Analysis

Model	χ^2_{df}
Respecified Model	$\chi^2_{30} = 48.11$
Combining Perceived Enjoyment with Perceived Usefulness	$\chi^2_{33} = 614.9$
Combining Perceived Enjoyment with Approach/Avoidance Behavior	$\chi^2_{33} = 219.0$
Combining Perceived Enjoyment with Impulse Buying Behavior	$\chi^2_{33} = 667.6$
Combining Perceived Usefulness with Approach/Avoidance Behavior	$\chi^2_{33} = 529.4$
Combining Perceived Usefulness with Impulse Buying Behavior	$\chi^2_{33} = 912.7$
Combining Approach/Avoidance Behavior with Impulse Buying Behavior	$\chi^2_{33} = 666.1$

5.6 The Structural Model

The respecified measurement model yielded acceptable levels of convergent validity, discriminant validity, and reliability. The next step involves the assessment of the structural model based on the cleansed measurement model (Segars 1997). In this step, the assessment of the structural model's fit is based on both the hypothesized relationships between the latent constructs and the paths between the latent variables and their associated observed variables (Chin et al. 1997). Thus, in addition to the four latent constructs in the measurement model, the

relationships between the independent variables and the dependent variables are also modeled in the structural model.

As indicated above, there are two SEM techniques that are available. Since the proposed model in this research endeavor is based on theory and consists of well-established constructs, the method of choice is the use of SEM over PLS (Gefen et al. 2000). However, PLS can be considered as a complementary technique to the covariance-based SEM (Chin 1998). While SEM's emphasis is on overall fit, thus being more confirmatory and model analytic, PLS emphasizes prediction and the variance in the latent variables, thus making it more data analytic (Teo et al. 2003). By using both techniques, the researcher can take advantage of both these methods, resulting in a better assessment of the research model. Thus, in this study, the structural model is assessed using both SEM and PLS. This approach will provide rich information about the use of these two different data techniques for structural equation modeling. The goal is to find a convergence between the results from both techniques.

5.6.1 Assessing the Structural Model Using SEM

AMOS, which supports covariance-based SEM, is used to assess the structural model. The aim of assessing the structural model is hypothesis testing. Thus, in this section, the structural model is assessed by examining the model fit. Then, the structural paths are checked for significance and direction, thus providing a test of the hypotheses.

5.6.1.1 The Need for Continuous Variables

In this research study, the presence of low and high task-relevant cues was manipulated, to investigate their influence on the dependent variables. Categorical variables involve discrete,

non-overlapping categories (Shavelson 1988). Moreover, these variables include a finite set of values, which cannot be divided into parts (Wimmer and Dominick 2000). Thus, for the current research, the presence or absence of these cues was operationalized by using two categorical variables (HTR and LTR). HTR was a categorical variable (0 or 1) which indicated the presence or absence of the high task-relevant cues. A score of 0 meant that the high task-relevant cues were absent, while a score of 1 meant that these cues were present. Similarly, LTR indicated the absence or presence of low task-relevant cues based on a score of 0 or 1 respectively. For instance, for the interface v3, which only contained the high task-relevant cues, HTR had a value of 1, while LTR had a value of 0.

AMOS supports covariance-based SEM. However, this software package does not yet allow the option of analyzing data of a categorical nature (Byrne 2001). Thus, it has been suggested that the categorical variables should be treated as if they are continuous (Chou et al. 1991). However, such a strategy is not without risks. It has been found that correlation coefficients are higher when computed between two continuous variables than when computed using the same variables ordered as categorical variables (Bollen 1989). SEM requires that the data be normally distributed to determine the relationships between the different variables (Chin and Newsted 1999) and more than often, models with categorical variables are considered to be in violation of the normality assumption. Moreover, a high degree of skewness is associated with categorical variables having less than five categories. Consequently, the inherent skewness leads to an inflated χ^2, as well as unstable parameter estimates (West et al. 1995). Thus, based on these reasons, the use of these categorical variables to test the structural model should be cautioned.

The alternative was to use a different software package to analyze the data. Mplus is a software package that allows the modeling of categorical variables. Using maximum-likelihood estimation, this software allows for the testing of the interactions between continuous latent variables using both continuous and categorical latent variable indicators (Muthén 1993). The cost of the most recent version of this software package (Mplus version 3) ranges between $195 to 595 (Muthén and Muthén). Moreover, a five-day training course is available, with the cost of $295 per day. Due to the constraints of time and resources, the use of Mplus could not be contemplated for this study.

So, the only plausible alternative was to use the available software package with categorical variables. For the manipulation checks, continuous variables were utilized to capture the subjects' perceptions of the three categories of interface categories, which include functional convenience, representational delight, and structural firmness. Since these variables were continuous and readily available, they were used to test the structural model using AMOS. An analysis of the means depicted in Figure 5.1 reveals that the manipulation of the high task-relevant cues was more evident when the security perceptions measure (Chang and Cheung 2001) was used. Similarly, for the low task-relevant cues, the use of the visual appeal measure (Loiacono et al. 2002) effectively captured the manipulation of these cues. Moreover, a review of the literature of website characteristics indicates that these two constructs have received much attention from researchers. Thus, these two constructs will be used as proxies for HTR and LTR in the structural model, as they better represent the manipulation of the low and high task-relevant cues.

As indicated, the structural model will also be tested by using a partial-least-squares-based approach to SEM. PLS supports the analysis of both categorical and continuous variables (Chin 1998). It is expected that the results based on each type of SEM will converge. Convergence of these results will also provide a validation of the use of these continuous variables as surrogates for the low and high task-relevant cues.

5.6.1.1.1 Assessing the Psychometric Properties of the Continuous Variables

Before these two constructs can be used in the model, their psychometrics properties have to be tested. A factor analysis was performed with these two variables by using the SPSS software package. Principal component analysis was used as the factor extraction method. When the factors emerged, varimax rotation was used to generate the factors. The factor loadings are depicted in Table 5.11. An analysis of the factor loadings indicates that the items clearly separated in two different variables. The factor loadings, which ranged from 0.833 to 0.960, were acceptable (Chin et al. 1997). The reliability coefficient was 0.97 for the security perceptions, while that for visual appeal was 0.99. Both of these values are considered as acceptable (Nunnally and Bernstein 1994). After the psychometric properties of these two measures were tested and confirmed, the next step involved assessing the fit of the structural model.

Table 5.11: Results of Factor Analysis

	Factor 1	Factor 2
SEC1	0.935	0.234
SEC3	0.920	0.233
SEC4	0.910	0.270
SEC2	0.883	0.229
VAP3	0.238	0.960
VAP2	0.257	0.944
VAP1	0.257	0.939

5.6.1.2 Assessing Model Fit Using SEM

For the structural model, in addition to the four constructs in the measurement model, security perceptions, which is a proxy for the high task-relevant cues, and visual appeal, which is a surrogate for the low task-relevant cues, were added. AMOS 4.01 was used to calculate the parameter estimates. The fit statistics are depicted in Table 5.12 and the resulting model with the factor loadings and correlations among the latent variables are depicted in Figure 5.5.

Table 5.12: Fit Statistics for the Structural Model Using SEM

Fit Indices	Observed Value
χ^2/df	2.49
GFI	0.92
AGFI	0.88
NFI	0.95
RMSEA	0.08

Figure 5.5: The Structural Model Using SEM

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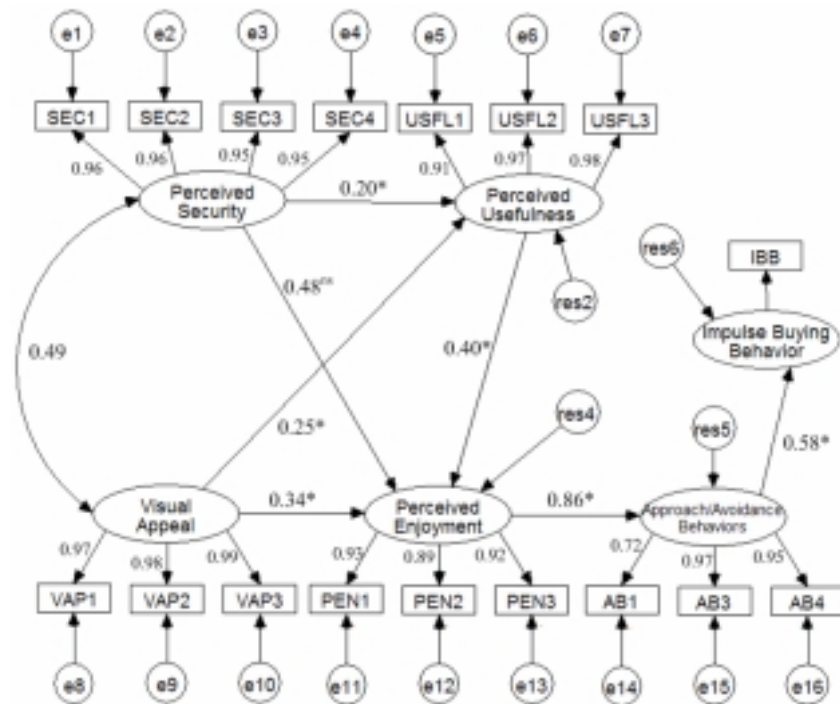
Based on the fit statistics, it can be concluded that the model has acceptable fit. The χ^2 to degrees of freedom ratio was less than the recommended 3:1 (Chin and Todd 1995). Values of 0.90 or higher for the GFI and NFI are considered as acceptable (Gefen et al. 2000) and the observed values were thus acceptable. The AGFI was above 0.80, which is considered as acceptable (Gefen et al. 2000). The RMSEA observed was acceptable, based on the recommendation of Jarvenpaa and colleagues (2000).

These fit statistics imply that the model fits the data optimally. The squared multiple correlations give an indication of the explained variance of the latent variables. The squared multiple correlations were 6 percent for perceived usefulness, 40 percent for perceived enjoyment, 74 percent for approach/avoidance behavior, and 33 percent for the impulse purchase behavior. All the relationships were significant except for the path between high task-relevant cues and perceived enjoyment.

5.6.2 Assessing the Structural Model Using PLS

PLS was also used to assess the structural model using the software package, PLS-Graph. PLS does not generate a statistic that indicates the overall fit of the model. Instead, the significance of the path coefficients and factor loadings are evaluated using t-values. These t-values can be estimated for the loadings using a bootstrapping technique. Bootstrapping is a technique whereby an original sample is duplicated as many times as the computing resources can handle (Chin 1998). The resulting sample is considered as a virtual population from which samples are drawn to estimate the parameters. The generated t-values are used to evaluate the significance of the different parameters in the model. Model fit can also be assessed using R^2,

which is the "fraction of the total variance in a dependent construct that is accounted for by those independent constructs impacting it" (Teo et al. 2003, p. 101), and the AVE, which is the square root of the average variance extracted by a latent variable from its observed variables. These various indices will be examined for model fit.

5.6.2.1 Assessing Model Fit with PLS

A bootstrapping procedure generated 216 random samples of size 216 each. To examine the significance of the different parameters, a critical value had to be determined from the t-distribution, against which the observed t-values are compared to indicate significance. The critical t-value depends on the degrees of freedom, which is $N - 1$ where N is the sample size, and the significance level. The degrees of freedom for this study was 215 (i.e., $216 - 1 = 215$). All the parameters are being assessed at $\alpha = 0.01$ level to allow for the comparison of the factor loadings and path coefficients from the structural model using SEM at a later stage. Using the statistical tables provided by Baker (2000), the critical value is 2.343. Thus, the t-values of these parameters should be greater than 2.343 for significance.

5.6.2.1.1 Examining the Factor Loadings

The loadings are depicted in Table 5.13. An analysis of these t-values indicates that the loadings are significant at $\alpha = 0.01$ level. The factor loadings range from 0.84 to 0.99, which is considered as acceptable (Nunnally and Bernstein 1994).

5.6.2.1.2 Examining the Average Variance

AVE "attempts to measure the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement error" (Chin 1998, p.

321). It is the square root of the average variance extracted by a latent variable from its observed variables. This statistic can also be interpreted as a measure of reliability for the latent variable. The norm is that the AVE should be greater than 0.50, which means that 50% or more variance of the indicators is accounted for (Chin 1998).

Table 5.13: The Factor Loadings Using PLS

Latent Variables	Observed Variables	Loading	t-Values
Perceived Usefulness	usfl1	0.95	29.30
	usfl2	0.97	41.32
	usfl3	0.99	42.10
Perceived Enjoyment	pen1	0.95	53.52
	pen2	0.94	41.31
	pen3	0.94	51.83
Approach/ Avoidance Behaviors	ab1	0.84	20.67
	ab3	0.96	33.59
	ab4	0.95	32.96

In Table 5.14, the AVE is presented in the diagonal with the grey background. The values are higher than the recommended value. This indicates that the latent variables are reliable. The reliability of the latent constructs is also evidenced by the reliability coefficients (Nunnally and Bernstein 1994). Moreover, to assess discriminant validity, the diagonal elements should be larger than any other entry in the corresponding rows and columns (Staples et al. 1999). Thus, after analyzing the different values, it is concluded that discriminant validity was supported.

Table 5.14: Reliabilities, Correlations, and Average Variance Extracted in PLS

Construct	Reliability	PE	PU	AAB
PE	0.96	0.893		
PU	0.98	0.382	0.937	
AAB	0.94	0.655	0.668	0.845
PE: Perceived Enjoyment				
PU: Perceived Usefulness				
AAB: Approach/Avoidance Behavior				

5.6.2.1.3 Assessing Path Coefficients and Variances

Using PLS, the measurement and structural components of the proposed research model were tested. Based on the results from the assessment of the measurement model, each latent variable and their remaining observed variables were modeled and directional structural paths connected the latent variables as predicted as theory. As indicated in Figure 5.6, all standardized path coefficients were significant at the $\alpha = 0.01$ level. The standardized path coefficients indicate the relative strengths of the different relationships. Given the evidence of convergent validity, discriminant validity, and reliability as well as the significant standardized path coefficients, it can be concluded that the data supports the proposed model.

Figure 5.6: The Structural Model Using PLS
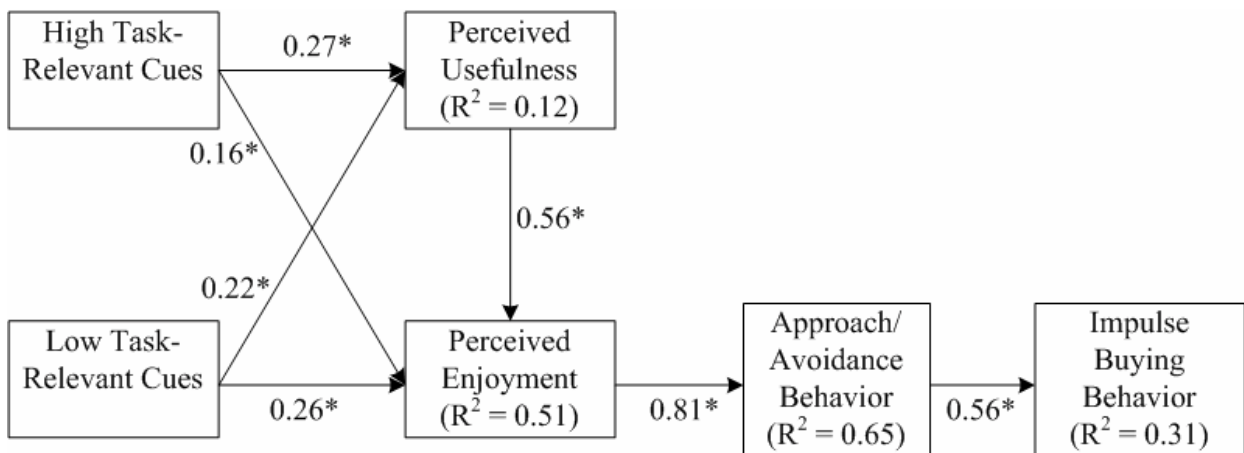
5.6.3 Comparing the Two Structural Models

In this study, a complementary approach was used whereby PLS was regarded as a complementary technique to SEM (Chin 1998). Thus, the structural model was assessed using both PLS and SEM. While SEM's emphasis is on overall fit, thus being more confirmatory and model analytic, PLS emphasizes prediction and the variance in the latent variables, thus making

it more data analytic (Teo et al. 2003). By using both techniques, the researcher can take advantage of both these methods, resulting in a better assessment of the research model.

In addition to the factor loadings and path coefficients generated, with SEM, a gamut of fit statistics can be used to assess model fit. Thus, in this study, five fit statistics were used, which included the χ^2 to degrees of freedom ratio, the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the normed fit index (NFI), and the root mean square error of approximation (RMSEA). In contrast, PLS does not generate any statistics that indicates the overall fit of the model. Instead, the significance of the path coefficients and factor loadings is evaluated using t-values, along with the R^2 and the average variance extracted (AVE). Thus, the results of the two structural models are based on the parameters that are common to these models. These include the factor loadings, the reliability coefficients, and the path coefficients.

5.6.3.1 Comparing the Psychometric Properties of the Constructs

The factor loadings represent the path coefficients from the observed variables to the latent variables. Table 5.15 depicts the factor loadings for the latent variables when SEM and PLS were used. An analysis of the factor loadings indicates that they were quite similar with both techniques, though with SEM some of the loadings were weaker (e.g., pen2). However, using both techniques, the psychometric properties of the constructs were established, by determining convergent and discriminant validity. Furthermore, with either technique, the constructs showed acceptable reliability coefficients. Thus, it can be concluded that except for minor differences, the same conclusion can be drawn from the results of both techniques.

Table 5.15: Comparing the Factor Loadings and Reliability Coefficients

Latent Variables	Observed Variables	Factor Loadings		Reliability	
		Using SEM	Using PLS	Using SEM	Using PLS
Perceived Usefulness	usfl1	0.91	0.95	0.97	0.96
	usfl2	0.97	0.97		
	usfl3	0.98	0.99		
Perceived Enjoyment	pen1	0.94	0.95	0.95	0.98
	pen2	0.89	0.94		
	pen3	0.92	0.94		
Approach/ Avoidance Behaviors	ab1	0.72	0.84	0.91	0.94
	ab3	0.97	0.96		
	ab4	0.95	0.95		

5.6.3.2 Comparing the Strengths of the Hypothesized Relationships

When using both techniques, the path coefficients were evaluated at the $\alpha = 0.01$ level so that the path coefficients for both models could be compared. Furthermore, since the path coefficients are standardized, the path coefficients from both models can be compared to each other. Table 5.16 depicts the path coefficients for each hypothesized relationships.

Table 5.16: Comparing the Paths Coefficients

Hypothesized Relationships	Path Coefficients	
	Using SEM	Using PLS
High task-relevant cues → Perceived Usefulness	0.20*	0.27*
High task-relevant cues → Perceived Enjoyment	0.48^{ns}	0.16*
Low task-relevant cues → Perceived Usefulness	0.25*	0.22*
Low task-relevant cues → Perceived Enjoyment	0.34*	0.26*
Perceived Usefulness → Perceived Enjoyment	0.40*	0.56*
Perceived Enjoyment → Approach/Avoidance Behavior	0.86*	0.81*
Approach/Avoidance Behavior → Impulse Buying Behavior	0.58*	0.56*

$\quad$ * $\quad$ Path significant at the 0.01 level
$\quad$ ns $\quad$ Path not significant

Except for the relationship between high task-relevant cues and perceived enjoyment, the same path coefficients were observed using both SEM techniques. Using SEM, the relationship between high task-relevant cues and perceived enjoyment was not significant, while with PLS,

the path coefficient was significant at the 0.01 level. For the present research, the use of PLS gave better support for the hypothesized relationships. This discrepancy may be explained by the fact that PLS emphasizes prediction and the variance in the latent variables, thus making it more data analytic while SEM's emphasis is on overall fit, thus being more confirmatory and model analytic (Teo et al. 2003).

5.6.3.3 Conclusion

When the decision was taken to assess the structural model, the aim was to use these two techniques to complement each other. By using both techniques, the researcher can take advantage of both these methods, resulting in a better assessment of the research model. Thus, the intent was not to determine which of the two data analysis techniques was superior to the other. For that reason, the results from both techniques will be used to test the hypotheses in the next section.

Since the results generated using SEM were quite similar on the whole to those obtained when using PLS, the use of the proxy variables in the assessment of the structural model using AMOS is warranted. Since these two chosen measures were better representatives of the low and high task-relevant cues, acceptable model fit were observed, which was consistent with the findings from data analysis using PLS. Thus, this is an important contribution to the field. When the research model consists of both continuous and categorical latent constructs and the researcher is constrained by the resources available for data analysis, he or she can effectively use a proxy variable instead of facing the risks involved with using categorical variables in

AMOS. However, this is based on the results on only one study. Future research should test this strategy in other contexts.

5.7 Results and Hypothesis Testing

The final step in the data analysis process is to examine the different relationships in the model to determine whether the constructs are significantly and directionally related as predicted by theory. In the following subsections, the relationships are analyzed using the results from both analysis techniques.

5.7.1 High Task-Relevant Cues and Perceived Usefulness (H_1)

Hypothesis H_1 posited that the high task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment. The path coefficient between high task-relevant cues and perceived usefulness was expected to be higher than that between high task-relevant cues and perceived enjoyment. When considering the results from SEM, the path correlation for the relationship between the high task-relevant cues and perceived usefulness was 0.20, while the coefficient for the path between these cues and perceived enjoyment was 0.48, but insignificant at the 0.01 level. The general trend is obvious based on the magnitude of the path coefficients, but the relationship between these cues and perceived enjoyment was expected to be significant consistent with research on TAM (e.g., Van der Heijden 2003; Van der Heijden 2004). Thus, when using SEM, partial support was obtained for H_1.

The use of PLS to assess the structural model led to different results. Both path coefficients were significant at the $\alpha = 0.01$ level. More specifically, path correlation for the relationship between the high task-relevant cues and perceived usefulness was 0.27, while the

coefficient for the path between these cues and perceived enjoyment was 0.16. The magnitude of the relationship between the high task-relevant cues and perceived usefulness was almost twice that of the relationship between these cues and perceived enjoyment. Thus, the subjects evaluated the high task-relevant cues for their usefulness rather than for the enjoyment derived, providing support for H_1.

5.7.2 Low Task-Relevant Cues and Perceived Enjoyment (H_2)

Hypothesis H_2 posited that the low task-relevant cues will have a greater effect on perceived enjoyment than on perceived usefulness. In other words, it was expected that the subjects will evaluate the presence of the low task-relevant cues for the enjoyment derived rather than their usefulness in meeting their shopping goals. Support for this hypothesis was found for this hypothesis using both data analysis techniques. The path coefficient for the relationship between low task-relevant cues and perceived enjoyment was 0.34 when using SEM and 0.26 when using PLS. The path coefficient was smaller for the relationship between low task-relevant and perceived usefulness, with 0.25 when using SEM and 0.22 when using PLS. The path coefficient between low task-relevant cues and perceived enjoyment was higher than that between low task-relevant cues and perceived enjoyment, thus providing support for H_2.

Since the low task-relevant cues increase the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of online shopping, a marked difference was expected between the two path coefficients. The path coefficient for the relationship between low task-relevant cues and perceived enjoyment was expected to be substantially bigger than that between these cues and perceived usefulness. Instead, the path coefficients when using

either SEM or PLS were not considerably different. For example, when using PLS, there was only a 0.04 difference between these two correlations. Thus, it is concluded that only moderate support was found for H_2. Possible causes for this relationship will be discussed in Chapter 6.

5.7.3 Perceived Usefulness and Perceived Enjoyment (H_3)

Hypothesis H_3 posited that perceived usefulness will have a positive effect on perceived enjoyment. More specifically, it is proposed that for an online impulse purchase to occur, there should be a positive relationship between perceived usefulness and perceived enjoyment, which will further enhance the emotional nature of the impulsive behavior. The positive sign of the path correlations indicates that there was a positive relationship between these two variables. Moreover, the path coefficient for this relation was significant at the $\alpha = 0.01$ level. The path coefficient was 0.40 when using SEM and 0.56 with PLS, indicating that the magnitude of the relationship was slightly higher when PLS was used. Since the path coefficient was positive and significant, support was found for hypothesis H_3.

5.7.4 Perceived Enjoyment and Approach Behaviors (H_4)

Hypothesis H_4 posited that perceived enjoyment will have a positive effect on the approach/avoidance behaviors. In other words, the higher the enjoyment derived from interacting with the interface, the more likely it is that the individual will shown approach behaviors in the form of the intention to explore the web offerings as well as the intention to revisit the website. The path coefficient when using SEM (0.86) was quite similar to the one obtained with PLS (0.81). Since the path coefficient was positive and significant at the $\alpha = 0.01$ level, support was found for H_4.

5.7.5 Approach Behaviors and Impulse Buying Behavior (H$_5$)

Hypothesis H$_5$ posited that an approach behavior will increase the likelihood of an impulse purchase occurring. More specifically, there would be a positive relationship between approach/avoidance behavior and impulse buying behavior. The path coefficient for this relationship was 0.58 when using SEM and 0.56 using PLS, indicating convergence. The positive sign indicates the hypothesized positive relationship between these two variables. Furthermore, the path was significant at the $\alpha = 0.01$ level. Thus, these findings provide support for H$_4$.

5.7.6 Assessing the Robustness of the Findings

The main purpose of the manipulation check was to determine whether the manipulation of the low and high task-relevant cues was salient to the subjects. Separate univariate analyzes of variance were concluded and from the results, it can be concluded that the manipulation of the features was valid at the 0.05 significance level. As expected, the respondents perceived the manipulations of these features on the different interfaces. However, before the changes in the dependent variables can be attributed to the manipulation of the independent variables, the internal validity of the study should be assessed in an attempt to ensure that any extraneous variables are controlled for.

To increase the robustness of the findings, different threats to internal validity were identified and addressed. To address the issues related to history, research sessions were carried on different days over a five-week period. The issues related to diffusion were addressed by managing the number of subjects within each session and asking the subjects not to divulge

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information about the study to their classmates. Selection bias was not an issue since the randomization process for this study was valid. Finally, the research model was based on strong theoretical arguments, which ruled out ambiguity about the direction of causal influence.

Moreover, to control for any confounds, the principal researcher conducted all the research sessions in the same experimental setting. By establishing that the manipulation of the independent variables worked and ruling out any threats to internal validity, it can concluded that the manipulation of the low and high task-relevant cues induced changes in the dependent variables in the anticipated directions.

5.8 Post-Hoc Comparisons

Post-hoc comparisons refer to the comparison of means which are carried out after the different statistical tests have been conducted. The aim of these comparisons is to analyze the means in an attempt to find out where the differences occurred in the dependent variables, which led to significant results (Shavelson 1988). Post-hoc comparisons were performed as a complement to the structural model. There is a wide gamut of post-hoc comparisons available and in this study, a multivariate analysis of variance was conducted along with a pairwise analysis using Tukey's HSD test.

5.8.1 Multivariate Analysis

Multivariate analysis of variance (MANOVA) is used to see the main and interaction effects of categorical variables on multiple dependent interval variables. It uses one or more categorical independents as predictors with more than one dependent variable. Conducting a MANOVA for post hoc comparisons allows the researcher to see which values of a factor

contribute most to the explanation of the dependent variables. Thus, in this study, two

MANOVAs were conducted by using SPSS to assess the effect of the low and high task-relevant

cues on the four dependent variables. The results are depicted in Table 5.17.

Table 5.17: Results of the MANOVA

Source	Dependent Var.	Sum of Squares	DF	Mean Square	F-Ratio	p
HTR	Usefulness	102.789^a	1	102.789^a	21.412	<0.001
	Enjoyment	96.000^a	1	96.000^a	21.373	<0.001
	Approach	99.023^b	1	99.023^b	25.901	<0.001
	Impulse Buying	44.042^c	1	44.042^c	18.514	<0.001
Error	Usefulness	1027.244	214	1027.244		
	Enjoyment	961.208	214	961.208		
	Approach	818.157	214	818.157		
	Impulse Buying	462.843	214	462.843		
C-Total	Usefulness	1130.027	215			
	Enjoyment	1057.208	215			
	Approach	917.180	215			
	Impulse Buying	502.884	215			
LTR	Usefulness	57.557^d	1	57.557^d	11.485	0.001
	Enjoyment	173.344^e	1	173.344^e	41.970	<0.001
	Approach	92.368^f	1	92.368^f	23.965	<0.001
	Impulse Buying	30.375^g	1	30.375^g	13.757	<0.001
Error	Usefulness	1072.470	214	1072.470		
	Enjoyment	883.865	214	883.865		
	Approach	824.812	214	824.812		
	Impulse Buying	472.509	214	472.509		
C-Total	Usefulness	1130.027	215			
	Enjoyment	1057.208	215			
	Approach	917.180	215			
	Impulse Buying	502.884	215			

a   R-Squared = 0.091 (Adjusted R-Squared = 0.087)
b   R-Squared = 0.108 (Adjusted R-Squared = 0.104)
c   R-Squared = 0.075 (Adjusted R-Squared = 0.075)
d   R-Squared = 0.051 (Adjusted R-Squared = 0.046)
e   R-Squared = 0.164 (Adjusted R-Squared = 0.160)
f   R-Squared = 0.101 (Adjusted R-Squared = 0.097)
g   R-Squared = 0.060 (Adjusted R-Squared = 0.056)

An analysis of the p-values in Table 5.17 indicates that both the low and high task-

relevant cues appear to have relatively equivalent, significant effects on all the dependent

variables. This test provides further support for the manipulation checks. The changes in the dependent variables were caused by the manipulation of the independent variables. The presence or absence of the low and high task-relevant cues shapes the subjects' perceptions of usefulness and enjoyment, which leads them to exhibit particular approach or avoidance behaviors which may lead to the impulse buying behavior.

5.8.2 Pairwise Comparisons

The means for the different dependent variables are depicted in Table 5.18 for the four different interfaces. A pairwise analysis of the means was performed to allow additional granularity to the results garnered from both the structural model and MANOVA analysis. The results of the pairwise comparisons are provided in Table 5.19.

Table 5.18: Table of Means

	Perceived Usefulness	Perceived Enjoyment	Approach/Avoidance Behavior	Impulse Buying Behavior
v1	4.66	3.68	3.02	2.24
v2	5.34	5.46	4.14	2.89
v3	5.69	5.00	4.19	3.06
v4	7.07	6.81	5.98	3.85

Table 5.19: Pairwise Comparisons

	Usefulness	Enjoyment	Approach	Impulse Buying
Δ between v1 & v2	p = 0.348	p = 0.000[*]	p = 0.010[*]	p = 0.054
Δ between v2 & v3	p = 0.832	p = 0.605	p = 0.999	p = 0.978
Δ between v3 & v4	p = 0.005[*]	p = 0.000[*]	p = 0.000[*]	p = 0.021[*]

* Significant at α = 0.05

Some interesting conclusions can be drawn from these results. The results obtained for perceived usefulness were considered first. The presence of the low task-relevant cues alone did not change the perceived usefulness of the website and neither did the presence of the high task-relevant cues alone, as evidenced by the difference in the means between interfaces v1 and v2, as

well as that between the interfaces v2 and v3. However, the presence of both the low and high task-relevant cues increased the perceived usefulness of the website. This provides support for the interactive effect of low and high task-relevant cues.

When considering the values for perceived enjoyment, the mere presence of the low task-relevant cues in interface v2 did increase the enjoyment derived when interacting with the website. Interface v3 only contained the high task-relevant cues, but the difference in the enjoyment experienced between these two websites was not significantly different. This is in line with the findings from the structural model. When testing for hypothesis H_2, the results indicated that the subjects enjoyed interacting with interface v3 as much as they did with interface v2. The enjoyment derived from interacting with v4 was optimum as it contained both types of cues. This result provides further support for the interactive effect of the low and high task-relevant cues.

The findings for the approach/avoidance behaviors were in parallel with those for perceived enjoyment, which indicates that subjects will show approach behaviors only when they are having fun with the website. Thus, the aesthetics of a website are very important in enhancing the user's online experience. The presence of the high task-relevant cues increases the perceived usefulness of an interface, which has an enhancing effect on the enjoyment derived from the website. This is evidence by the significant difference between the means for approach/avoidance behaviors between interfaces v3 and v4. Finally, in the case of the impulse buying behavior, it was evident that both the low and high task-relevant cues must be present to increase the likelihood that the subject will engage in an impulse purchase. This provides support for the main proposition of the online model of impulse buying.

5.9 Summary

This chapter provides a detailed description of the data analysis techniques used to test the hypotheses and the results. Comprehensive descriptions of the chosen data analysis technique as well as the obtained results were provided.

The hypotheses were also tested in this chapter. Hypothesis H_1 posited that the high task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment, and the data provided support for this hypothesis. Moderate support was found for H_2, where the low task-relevant cues had a greater effect on perceived enjoyment than on perceived usefulness. A weak relationship was expected between low task-relevant cues and perceived usefulness, but instead, a strong relationship existed between these two constructs. As predicted, there was a relationship between perceived usefulness and perceived enjoyment (H_3). H_4 was also supported, showing that perceived enjoyment has an effect on an approach behavior. Finally, the data provided support for H_5, where it was hypothesized that an approach behavior will lead to impulse buying. Thus, we found support for all the hypotheses (see Table 5.20).

In the next chapter, the interpretations that may be logically derived from these significant results will be provided. In addition, possible explanations for the interesting finding between the low task-relevant cues and perceived usefulness will be explained along with a discussion of the limitations of this study, the proposition of future research endeavors, and the drawn conclusions.

Table 5.20: Summary of Results from Hypothesis Testing

Hypothesis		Result
1	High task-relevant cues will have a greater effect on perceived usefulness than on perceived enjoyment.	Supported
2	Low task-relevant cues will have a greater effect on perceived enjoyment than on perceived usefulness.	Moderately Supported
3	Perceived usefulness will have a positive effect on perceived enjoyment.	Supported
4	Perceived enjoyment have a positive effect on approach behaviors.	Supported
5	An approach behavior will increase the likelihood of an impulse purchase occurring.	Supported

CHAPTER 6

DISCUSSION AND CONCLUSION

This chapter discusses the findings, limitations, implications, and future work that extends the present research endeavor. The first section of the chapter provides a detailed explanation of the results obtained in this study. The limitations of the conducted study are then covered. This is followed by a discussion of the theoretical and practical implications of this research. The penultimate section covers the areas of the study that merit further investigation. Finally, the conclusions drawn from this research study and the dissertation process are presented.

6.1 Discussion

Several researchers have called for future research to understand how online environments can be best designed to increase unplanned purchases (e.g., Koufaris 2002). A model of online impulse buying that examines the influence of low and high task-relevant cues on online impulse buying is proposed (see Figure 6.1). The main assumption of this model is that since the impulsive buying behavior is primarily hedonic, to increase the likelihood that the consumer will engage in an impulse purchase, hedonic reactions to the interface should be maximized through the presence of the low task-relevant cues, while keeping negative cognitive reactions to a minimum through the availability of the high task-relevant cues. The findings of the dissertation support the proposed research framework, and thus, this proposition.

The discussion of the findings is divided into two subsections. In the first subsection, the interpretations that may be logically derived from the significant results will be provided in

reference to the five proposed hypotheses. In the second subsection, an interpretation of the findings from the hypothesis testing stage is provided.

Figure 6.1: A Model of Online Impulse Buying
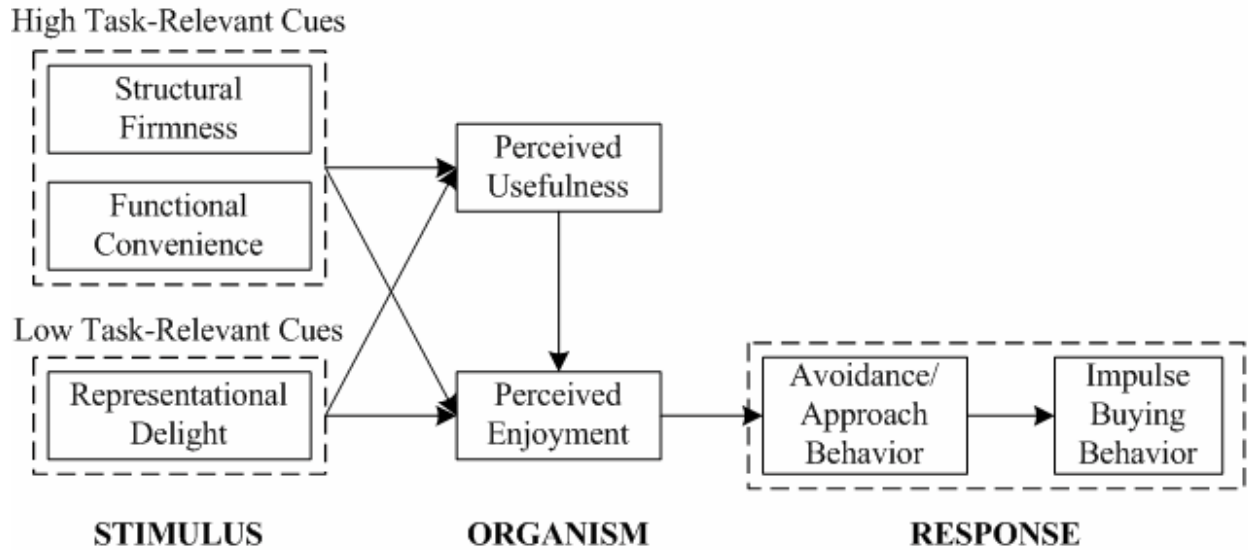
6.1.1 High Task-Relevant Cues and Perceived Usefulness (H$_1$)

As predicted by the theoretical framework, the presence of the high task-relevant cues on the interfaces was shown to have a significant, positive influence on perceived usefulness. This is in line with work in the domain of technology acceptance. Within that area of research, the ease of use of a system has been found to increase its usefulness (Davis 1989; Davis et al. 1989). Similarly, the relationship between web security and the usefulness of a website has been supported (e.g., Salisbury et al. 2001). In the present research, these two features represent the functional convenience and structural firmness categories respectively, both of which have been classified as being high task-relevant. These cues are essential in the online consumer's shopping goal attainment (Eroglu et al. 2001), and hence, are of a utilitarian nature (Babin et al. 1994). As evidenced by the results of this study and other studies on technology acceptance, these cues are

evaluated based on their usefulness in the attainment of the shopping goal. Thus, the usefulness of a website will depend on the presence of these high task-relevant cues.

The results also support the existence of a relationship between these high task-relevant cues and the enjoyment derived from interacting with the website. The presence of these cues heightens the emotional aspect of the online experience. Van der Heijden (2003; 2004) has also found support for this relationship. More specifically, he found that there is a positive relationship between ease of use and enjoyment. In contrast, the absence of these cues will lead to negative emotions. For instance, a website that has slow response time and is difficult to use will frustrate a user, making him or her switch to another website. Thus, the presence of these cues will enhance the enjoyment derived from interacting with the website.

Since the high task-relevant cues are of a utilitarian nature, they were expected to have a greater effect on the perceived usefulness of a website rather than the perceived enjoyment. The findings of this study provide support for this proposition. The presence of the high task-relevant cues was found to have as much as approximately twice the predictive value to explain perceived usefulness as compared to explaining perceived enjoyment. This finding can be attributed to the fact that when consumers are oriented toward the achievement of their shopping goal, they need these cues mainly to aid them in meeting their goal and thus, are not very concerned about the hedonic aspect of these cues (Mathwick et al. 2001). This finding is in concordance with the recent work by Van der Heijden (2004), who proposed that perceived usefulness is a stronger determinant of the intention to use an information system of a utilitarian nature than is perceived enjoyment.

6.1.2 Low Task-Relevant Cues and Perceived Enjoyment (H$_2$)

As expected, the low task-relevant cues were found to have a positive influence on the enjoyment derived when interacting with the website. In this study, the features associated with representational delight have been classified as being low task-relevant. These cues have been found to create a mood at the site, which makes the consumer's online experience a more pleasurable one (Eroglu et al. 2001). The presence of these cues enhances the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of the online experience. Other researchers have found support for the relationship between these low task-relevant cues and perceived enjoyment. For instance, the perceived attractiveness of a website has been found to increase the level of enjoyment experienced when interacting with a website (Van der Heijden et al. 2003). Thus, the enjoyment derived from interacting with a website will depend on the presence of the low task-relevant cues or the features associated with representational delight.

Based on the research model, the presence of the low task-relevant cues was expected to influence the perceived usefulness of the website. Support was found for this relationship. The consequences of aesthetics on usefulness have been studied extensively in psychology and marketing, where it has been found that people associate more favorable attitudes towards attractive individuals or products (Dion et al. 1972). This finding has been replicated in the information systems domain. The perceived attractiveness of a system or a website has been found to increase its perceived usefulness (Tractinsky et al. 2000; Van der Heijden 2003). The findings of this study add to this body of knowledge.

Since the low task-relevant cues are enjoyed more for their own sake, than for their instrumental or practical purposes (Chandon et al. 2000), the relationship between the low task-relevant cues and perceived enjoyment was expected to be greater than that between these cues and the perceived usefulness. Support was found for this difference. However, the relationship between the low task-relevant cues and perceived usefulness was expected to be much weaker than that between these cues and perceived enjoyment. Instead, the relationship between the low task-relevant cues and perceived usefulness was observed to be as strong as that between these cues and perceived enjoyment. Interestingly, the presence of low task-relevant cues increased the perception of usefulness. This finding has been labeled as "what is beautiful is usable" (Tractinsky et al. 2000). The mere presence of the low task-relevant cues gives an illusion of usefulness, as well as enhances the enjoyment derived when interacting with the website.

6.1.3 Perceived Usefulness and Perceived Enjoyment (H₃)

As predicted by the theoretical model, the usefulness of a website was shown to have a significant, positive influence on the enjoyment derived when interacting with the website. In this study, perceived usefulness was used as a surrogate for the cognitive reactions experienced when interacting with the website, while perceived enjoyment was a proxy for the emotional reactions. The influence of cognitions on affect has been proven in consumer behavior literature (e.g., Shiv and Fedorikhin 1999). For instance, the expenditure of cognitive effort has been associated with negative affect (Garbarino and Edell 1997). Since the impulse buying behavior is more emotional than rational (Rook 1987), negative cognitive reactions should be kept to a minimum (Weinberg and Gottwald 1982). This reduction in negative cognitive evaluations leads

to positive affect (Beatty and Ferrell 1998). Thus, the presence of the high task-relevant cues enhances the enjoyment derived from interacting with the website through their influence on the usefulness of the website.

6.1.4 Perceived Enjoyment and Approach/Avoidance Behaviors (H₄)

As expected, perceived enjoyment was found to have a significant, positive effect on the approach behavior. This finding is in accordance to the stimulus-organism-response (S-O-R) framework, where it has been proposed that the emotional responses lead to approach behaviors (Eroglu et al. 2001). For approach behaviors, the emotional reactions should be positive, while any negative reactions will lead to avoidance behaviors. Eroglu and colleagues (2001) have also found support for this relationship between the emotional responses and approach/avoidance behaviors.

6.1.5 Approach/Avoidance Behaviors and Impulse Buying (H₅)

As expected, approach behaviors were found to lead to online impulse buying. This relationship has been tested only in the context of a brick-and-mortar store. In-store browsing has been found to be a central component of the impulse buying process (Beatty and Ferrell 1998). In this study, the relationship between approach behaviors and impulse buying is tested in an online context and support is found for this relationship. Any approach behavior will increase exposure to the stimulus, which can increase the likelihood of an impulse purchase occurring, since the stimulus is the catalyst in the impulse buying process.

6.1.6 Interpretations of the Results

Support was found for all the hypotheses and in this subsection, an interpretation of these

findings is provided. A model of online impulse buying that examines the influence of low and high task-relevant cues on online impulse buying was proposed. The main assumption of this model is that to increase the likelihood that the consumer will engage in an impulse purchase, negative cognitive reactions should be kept to a minimum through the availability of the high task-relevant cues, while hedonic reactions to the interface should be maximized through the presence of the low task-relevant cues (Weinberg and Gottwald 1982). Since the impulse buying behavior is more emotional than rational (Rook 1987), the emotional aspect of the interaction with the website should be enhanced. Thus, based on the findings, two conditions are found to enhance online impulse buying behavior, namely the minimization of negative cognitive reactions and the maximization of positive emotional reactions.

6.1.6.1 Minimization of Negative Cognitive Reactions

The first condition is the minimization of any negative cognitive reactions. These cognitive reactions are formed based on the presence or absence of the high task-relevant cues. Thus, the minimization of any negative cognitive reactions can be achieved through the presence of the high task-relevant cues, in the form of the features associated with structural firmness and functional convenience. The features of structural firmness and functional convenience are essential in enhancing the emotional aspect of the online experience, and concurrently, in the occurrence of the impulse purchase.

When the online user interacts with the website, he or she unconsciously evaluates the presence of the high task-relevant cues. Consequently, this evaluation will help further enhance the emotional aspect of the interaction, which will increase the probability of an impulse

purchase occurring (Beatty and Ferrell 1998). For instance, while browsing a website, the consumer will have a notion of the website's speed and ease of use, which will further enhance the pleasure derived from interacting with the website. Furthermore, the presence of these cues will be crucial at the ordering phase to maintain the positive reactions. These reactions can be maintained through the provision of high task-relevant cues, such as ease of ordering and the provision of security seals.

To illustrate the importance of the presence of the high task-relevant cues in impulse buying, the strategy used by an online retailer is discussed. Amazon.com is a virtual book seller that offers a wide gamut of products for sale which range from CDs and books to tools and hardware. This company has invested in the implementation of a feature on its website, which is known as single-click ordering or one-click ordering. This feature reduces the burdens placed on the customer in the ordering process, thus reducing the likelihood of any negative cognitive reactions. When the online user registers at the website, he or she enters his or her personal information and shipping preferences with the guarantee that this information will be secure. When ordering a product, the individual does not have to go through the lengthy process of entering the information necessary for the order each time he or she is making a purchase. Therefore, the process of ordering can be completed within a minute (Chaudhury et al. 2001). With this feature, an approach behavior in the form of web browsing can, in a minute, lead to an impulse purchase.

6.1.6.2 Maximization of Positive Emotional Reactions

The second condition is the maximization of positive emotional reactions. These

emotional reactions are formed based on the presence or absence of the low task-relevant cues. Thus, the maximization of positive emotional reactions can be achieved through the presence of the low task-relevant cues, in the form of the features associated with representational delight. The presence of these cues enhances the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of the online experience. Since the impulse buying behavior is more emotional than rational (Rook 1987), the enhancement of the positive emotional reactions increases the likelihood that an impulse purchase will occur.

Affect has been identified as being a central component of the impulse buying process. It has been suggested that when a person experiences positive emotional reactions, they typically engage more in approach behaviors than in avoidance behaviors (Mehrabian and Russell 1974). Moreover, these individuals tend to reward themselves more to maintain this positive emotional state. Accordingly, individuals who are in a positive mood or are experiencing positive emotional reactions would be more conducive to impulse buying (Rook and Gardner 1993).

To illustrate the importance of the presence of the low task-relevant cues in impulse buying, the strategy used by an online retailer is discussed. iTunes is a virtual music store that allows users to buy digital music files online. The online consumer can browse an extensive list of songs, preview different songs, and buy them too. By allowing the consumers to preview the different songs, the emotional aspect is further enhanced, which can trigger the impulse buying process. Moreover, with digital music files, the consumers can benefit from immediate gratification. Such an interface coupled with the provision of the features of functional convenience and structural firmness will increase the likelihood of an impulse purchase

occurring.

6.2 Limitations

Any study has limitations that can potentially affect the findings. In this section, these limitations are addressed. The following subsections describe the limitations of the research including methodological shortcomings, generalizability, manipulation of functional convenience, and the inability to rule out rival hypotheses.

6.2.1 Methodological Shortcomings

As McGrath (1982) indicates, all research methods are inherently flawed in one way or the other. Since this research stream is still in its very early stages and the researcher's intent was to build and test theory, a decision was made to maximize precision over generalizability and realism. Thus, a laboratory experiment was chosen as the method of choice. It has been argued that the behaviors studied in a laboratory experiment do not necessarily occur in the same pattern in a real-world setting. In this study, the subjects were forced into a pattern of action before indicating their impulsiveness. However, the interfaces were intentionally designed to emulate an existing website. In informal talks with the subjects after the experiment, it was evident that the subjects perceived these websites as being realistic proxies for typical e-commerce websites as they were very concerned about entering their private information for fear of being charged for any products in their shopping carts. Thus, the experiment served as a reasonably representative surrogate for a real-world situation.

The use of the scenario in this study might be criticized for not being realistic. The use of scenarios as a substitute for other methods has been controversial (e.g, Surprenant and Solomon

1987), but concurrently its merits have been defended (e.g., Rook 1987). The use of scenarios maximizes precision, allowing the researcher to more easily operationalize expensive or difficult manipulations. Moreover, several studies have confirmed that the use of scenarios in an experimental setting can provoke emotional responses (Bagozzi et al. 1999; Dholakia 2000; McCollough et al. 2000). The use of scenarios reduces the likelihood of social desirability (Fisher 1993; Wirtz and Kum 2001), because the subjects will provide their "true" response, given that they will not be judged on their behavior (Fisher 1993). Thus, for these reasons, it is believed that the subjects who were impulsive projected themselves in the situation and chose the most impulsive alternative which involved buying the new bag, a matching holster, and an iPod case. Moreover, the descriptives, manipulation check, and post-hoc analyses revealed that the impulsive behavior varied across the different interfaces.

6.2.2 Generalizability

Laboratory experiments maximize precision at the expense of generalizability (Dennis and Valacich 2001). Consequently, external validity will always be a concern in such experiments. It is believed that the choice of the product and the use of a homogenous sample of students in this study have limited the generalizability of the findings. In the next subsections, these issues are addressed.

6.2.2.1 The Use of Tote Bag as the Stimulus

A fictitious online store, Totebags.com, was created for this experiment. This online store was specialized in selling tote bags along with various accessories, such as CD cases, iPod cases, and cell-phone holsters. Tote bags were chosen as the product of interest for this experiment

because these bags as well as the available accessories are salient to this sample of college students in their everyday life. However, the results of this study can only be generalized to the sale of tote bags. Certain products are bought more impulsively than others (Mai et al. 2003). Thus, future research should study the impulsiveness of individuals when other products that are more conducive to being sold online are considered. For example, iTunes allows the online consumer to buy music digital files at its website. Since digital music is more conducive to being sold online than bags, there is the advantage of immediate gratification and thus, individuals can be more impulsive when buying these digital music files.

6.2.2.2 The Use of Homogenous Subjects

The use of students as subjects in laboratory experiments has been criticized. More specifically, using homogenous subjects can lead to issues regarding the generalizability of the findings. In a laboratory setting, subjects behave in ways that they would not normally do in a real-world setting. However, even though a student sample was used, it is not believed that the approach used compromised the external validity of the results. There are several extenuating factors that suggest that the results can be generalized to college students.

It is believed that the sample is appropriate for this study, based on a study reported in the Pew Internet & American Life Project. The aim of this project is to produce reports that explore the impact of the Internet on individuals at their work and in their everyday life. According to this study carried out in February to March 2005, it was found that the age of the people who mostly use the Internet ranges between 18 and 29 and that females used the Internet as often as males (Pew Internet & American Life Project 2005). The main conclusion drawn from this study

was that college students are the heaviest Internet users. It is thus believed that the sample chosen for this study is representative of this larger population and therefore, results from this study can be generalized to this population of Internet users.

Another potential threat to external validity is that systematic differences can exist between the different groups of subjects used in the study, which decrease the generalizability of the findings. However, it was found that there were no striking differences among these experimental groups. Approximately half of the subjects were females (49.5 %), the average age of the subjects was 20.26 years,m and there was no systematic difference in their experience as online shoppers. Thus, since the demographics of this sample are closely aligned with those of the general population of Internet users, it can be concluded that the sample used in this study was a reasonable representation of the target population.

It has been argued that the experimental setting resembles or is a special case of a real-life setting (Benbasat 1989). Moreover, since theories rather than findings enable generalization, powerful ideas may aid in understanding more than a surface resemblance between the laboratory and the field (Dennis and Valacich 2001). Generalizations can be made by testing the theory in alternative settings (Cook and Campbell 1979). Given the constraints of time and resources, the present research only reports the findings of an experiment carried out to test the hypotheses. Replication in more natural settings as a means to improve external validity is considered as a future research endeavor.

6.2.3 Manipulation of Functional Convenience

The manipulation of functional convenience was not as effective as that of structural

firmness and representational delight. The level of functional convenience across the different interfaces was almost constant. When designing the interfaces, a decision had to be made to determine whether the manipulation of this category needed to be stronger. This would be achieved through the design of a website that was very difficult to use. However, to strike a balance between precision and realism, the manipulation of functional convenience was not strengthened. The interfaces were intentionally designed to emulate an existing website, causing a possible reduction in precision. Future research should attempt to further magnify the differences in functional convenience.

6.2.4 Inability to Rule out Rival Hypotheses

In this study, a positivist approach was adopted and such an approach inherently only allows the examination of a limited number of independent variables that are believed to influence the dependent variable being studied (Lee 1991). It is practically impossible to examine every variable that may influence online impulse buying in one empirical study. The focus on the present research endeavor was on studying the main effects of the variables examined in the research model.

There are a number of possible interactions, which may be more interesting than the main effects. For instance, an interactive effect was evident between the low and high task-relevant cues. Furthermore, the moderating effects of different variables on the relationships were excluded in this study. Given the relevance of interactions and moderators in explaining behaviors, it is believed that this is an important avenue to pursue. Furthermore, the cross-sectional nature of this study limits the scope of the findings. It is believed that after the impulse

purchase occurs, the consumer experiences emotional and/or cognitive reactions, which can include guilt or disregard for future consequences. Because of the nature of the study, this aftermath effect of the behavior on the cognitive or emotional reactions cannot be studied.

6.3 Implications for Research and Practice

Although several limitations of this study have been identified, the present research makes valuable contributions to both theory and practice. The aim of this research endeavor was to build and test a model that examines the influence of low and high task-relevant cues on online impulse buying. An experimental study was designed to test the proposed model, where precision was maximized. Thus, valid conclusions can be drawn about the merits of the proposed theoretical model. In the following subsections, the theoretical and practical implications of the dissertation are presented.

6.3.1 Theoretical Implications

The prevalence of impulse buying in an online context has piqued the interest of several researchers recently. While these studies have provided a foundation in the understanding of online impulse buying, a common theme emerging from these different studies is a call for research to understand the online impulsive buying behavior. The foremost contribution of this research endeavor to academia involves a theoretically grounded and tested model to explain and predict online impulse buying. The results of this study provide a stepping stone to the road to understand online impulse buying. In the forthcoming subsections, the specific implications of this research to academia are presented.

6.3.1.1 Better Understanding of Online Impulse Buying

There is evidence that impulse buying is rampant in an online context (Li et al. 2000). To date, only few researchers have studied the online impulse buying behavior. An integral part of this research was to provide a detailed description of the distinct web characteristics that make impulse buying in an online context significantly different from traditional impulse buying (see section 2.1.2.1 in Chapter 2). This distinction was essential to provide a better understanding of the online impulse buying phenomenon so that a theoretical model could be developed to understand and predict online impulse buying.

Drawing from different areas of research, such as information systems, consumer behavior, and environmental psychology, a model of online impulse buying is proposed that provides a foundation for observing impulse buying in an online context. The findings of this study confirm existing literature on impulse buying that this behavior is a result of emotional reactions. This study shows that two conditions enhance online impulse purchase behavior. To increase the likelihood that the consumer will engage in an impulse purchase, hedonic reactions to the interface should be maximized, while keeping negative cognitive reactions to a minimum. In order to minimize negative cognitive reactions, the consumer has to feel safe and secure on the website and at the same time, be able to navigate easily from one page to the other. This is achieved through the provision of the high task-relevant cues, such as structural firmness and functional convenience. The second condition is maximizing the positive emotional reactions to the interface. This is done by providing the low task-relevant cues, such as an appealing, creative, and innovative design.

6.3.1.2 Contribution to Information Systems Field

This research has the potential to add to the body of knowledge related to the information systems field in two important ways. The findings of the study provide an extension of the technology acceptance model (TAM) in explaining the use of utilitarian and hedonic information systems. Moreover, this study contributes to the general literature on human-computer interaction (HCI). Each of these contributions is discussed next.

6.3.1.2.1 Contribution to Technology Acceptance Literature

In a recent study, Van der Heijden (2004) tested the role of perceived ease of use, perceived enjoyment, and perceived usefulness in the acceptance of hedonic and utilitarian information systems. Perceived enjoyment and perceived ease of use were stronger determinants of the intention to use a hedonic information system than was perceived usefulness. Another important finding in this study was the important contribution of ease of use in the acceptance of utilitarian and hedonic information systems. However, the link between perceived usefulness and perceived enjoyment was not tested.

In the present research endeavor, perceived usefulness was found to have a significant, positive influence on perceived enjoyment. The influence of cognitions on affect has been proven in consumer behavior literature (e.g., Shiv and Fedorikhin 1999), and the results of this study provide further support for this link. Since impulse buying is more emotional than rational (Rook 1987), the presence of the high task-relevant cues enhanced the enjoyment derived from interacting with the website, through their influence on perceived usefulness. A logical extension of this finding to the acceptance of hedonic information systems points is the possibility that the

same relationship would exist whereby the usefulness of a system will increase its perceived enjoyment and thus, perceived usefulness will be as important as perceived enjoyment in predicting the acceptance of hedonic information systems. This finding provides fodder for thought and provides a significant contribution to the technology acceptance literature.

Another interesting finding which adds to this body of knowledge is the unexpected strength of the relationship between the low task-relevant cues and perceived usefulness. The low task-relevant cues were expected to have a greater effect on perceived enjoyment than on perceived usefulness and the relationship between low task-relevant cues and perceived usefulness was expected be very weak. However, the relationship between low task-relevant cues and perceived usefulness was as strong as that between these cues and perceived enjoyment. This finding provides further support for the proposition that "what is beautiful is usable" (Tractinsky et al. 2000).

6.3.1.2.2 Contribution to Human-Computer Interaction Literature

In the HCI literature, many researchers have used surveys to investigate the effects of different web characteristics on the dependent variables associated with the TAM model (e.g., Agarwal and Venkatesh 2002; Aladwani and Palvia 2002; Liu and Arnett 2000; Moon and Kim 2001; Van der Heijden 2003; Van der Heijden 2004). When using surveys, the aim of the researcher is to collect data in a systematic way from a very large sample (Benbasat 1989). Consequently, surveys maximize generalizability, since inferences can be made about the population based on the data collected. However, these strategies fail to meet the requirements of realism and precision (Dennis and Valacich 2001).

In the present research, a laboratory experiment was used to test the proposed research model. Experimental studies maximize precision, in favor of generalizability and realism (Dennis and Valacich 2001). The research setting allows unmistakable control over virtually all the variables involved (Stone 1978). Thus, experimental designs lead to the discovery of new relationships, which are not evident in a natural setting (Weick 1967) or when using surveys. Thus, it is believed that the results of this study provide a very clear view of the influence of the low and high task-relevant cues on two dependent variables associated with the TAM model, namely perceived enjoyment and perceived usefulness. For instance, the interactive effect of the low and high task-relevant cues on these two dependent variables was apparent.

Another potential contribution is the development of the online consumer's hierarchy of needs in the pilot study. A review of the HCI literature reveals one important aspect of web interface evaluation that has been left out; how the consumer prioritizes interface characteristics. Thus, the results from the pilot study provide a more focused conceptual and theoretical view of how online consumers perceive and prioritize different categories of electronic commerce (e-commerce) interface characteristics. The e-commerce categories, which were proposed by Kim and colleagues (2002) and used to develop the online consumer's hierarchy of needs, are attractive from a conceptual framework perspective as they are relatively parsimonious and arguably orthogonal. Using these prioritized categories, researchers are provided with a stronger orientation as they consider specific design characteristics within each category and frame them as potential independent and control variables.

6.3.1.3 Contribution to Reference Fields

A multi-disciplinary approach was adopted for this study. Support for the proposed theoretical model was drawn from different areas of research, such as information systems, consumer behavior, and environmental psychology. This practice is common in the information systems field. Researchers have used, redefined, and potentially redeveloped theories in other reference disciplines to provide answers to interesting research questions (Keen 1980). However, this flow of information is not unidirectional (Cote et al. 1991; Zinkhan et al. 1992). Consequently, in addition to the contributions to the information systems field, the findings from this study will extend theories that have been used in the reference disciplines.

6.3.1.3.1 Contribution to Consumer Behavior Literature

A literature review of the consumer behavior reveals that many researchers have studied the impulse buying phenomenon in an offline setting. These studies have made a significant contribution to the understanding of impulse buying in a traditional shopping context. The progression of the impulsive buying behavior to the Internet, however, leads to a logical extension of exploring this behavior in an online context. More specifically, theoretical frameworks should be developed to understand and predict online impulse buying. However, except for a study by Madhavaram and Laverie (2004), there has been a dearth of research about online impulse buying in the consumer behavior literature. Thus, this study can contribute greatly to the body of knowledge on impulse buying in this reference discipline.

6.3.1.3.2 Contribution to Environmental Psychology Literature

This study is also an extension of the model of online atmospherics proposed by Eroglu

and colleagues (2001). According to this model, online environmental cues lead to affective and cognitive states, which in turn lead to approach or avoidance behaviors. Eroglu and colleagues (2003) tested this model where they manipulated the online environmental cues. They compared an interface which contained only the high task-relevant cues with one that contained both the low and high task-relevant cues. The major conclusion from this study is that online store atmosphere does make a difference.

A main limitation of this study is that the influence of the low task-relevant cues on cognitive and emotional reactions was not investigated. In the limitations section, the author indicate that "from a design point of view, a study that manipulates cues unobtrusively" would provide a superior test of the model of online atmospherics (Eroglu et al. 2003, p. 148). This study addresses this limitation by investigating the influence of both low and high task-relevant cues on these internal states. Moreover, in the present study, strong theoretical and empirical support is found for the relationship between the cognitive and emotional states. In the model of online atmospherics, Eroglu and colleagues (2003) did not test this relationship.

Moreover, this model is instantiated in the context of impulse buying. More specifically, this study establishes the influence of these online environmental cues on the online consumer's behavior. In the model of online atmospherics, the final dependent variable is represented by the approach/avoidance behaviors, which include intention to revisit the website or explore the online store offerings (Eroglu et al. 2001; 2003). The present study provides an extension of this model by studying the actual behavior rather than just the intentions.

In atmospherics research, the affective reactions have been categorized along the

pleasure, arousal, and dominance (PAD) dimension. This dimension was used in the pilot study, but the psychometric properties of the measure were poor (see Appendix B). Consequently, the dominance subdimension had to be dropped. While the resulting measure (i.e., excluding the dominance dimension) is parsimonious and easy to use, it does not fully capture the gamut of possible emotional reactions (Eroglu 1987; Machleit and Eroglu 2000). Consequently, it has been suggested that researchers should use a more comprehensive set of emotions (Eroglu et al. 2001) or should use internal states that are "hypothesized to be relevant in their specific research context" (p. 181). Thus, another important contribution of the present research is the use of usefulness and enjoyment as reaction variables (i.e., the organism) which are more conducive to information systems research.

6.3.1.4 The Use of Different Data Analysis Techniques

Two different data analysis techniques were used to test the structural model, which allows an assessment of the hypothesized relationships between the latent constructs and the paths between the latent variables and their associated observed variables (Chin et al. 1997). The implications of this strategy to academia are presented in the following subsections.

6.3.1.4.1 Complementary Approach to Test the Structural Model

Since its introduction to the information systems literature in 1990, there has been a sturdy growth in the use of SEM techniques. These techniques allow better measurement precision as well as a simultaneous analysis of the psychometric properties of the constructs and the hypothesized relationships between the constructs. In fact, the use of these techniques for validating instruments and testing the relationships between constructs has become "de rigueur"

in this field (Gefen et al. 2000, p. 6). For these reasons, the SEM approach is considered as the tool for data analysis in this research endeavor. Two distinct SEM techniques are available, namely covariance-based SEM, referred to as SEM, and partial-least-squares-based SEM, referred to as PLS.

The choice between these two types of SEM largely depends on the nature of the research endeavor. If the research model is based on theory and consists of well-established constructs, SEM is the method of choice (Gefen et al. 2000). Concurrently, if the researcher's intent is theory building, PLS is more appropriate. Thus, the supremacy of one technique over the other has been established. For instance, it has been found that SEM provides better estimates and more accurate model analyzes (Bollen 1989). Alternatively, several researchers have used these techniques in a sequential fashion, typically testing the measurement model with SEM followed by an assessment of the structural model using PLS (e.g., Teo et al. 2003). Thus, the main conclusion from these studies is that SEM is more appropriate for assessing the measurement model, while PLS is more useful in the assessment of the structural model.

This study is among one of the first ones+ which uses a complementary approach, whereby PLS has been regarded as a complementary technique to SEM (Chin 1998). While SEM's emphasis is on overall fit, thus being more model analytic, PLS emphasizes prediction and the variance in the latent variables, thus making it more data analytic (Teo et al. 2003). A complementary approach results in a better assessment of the research model. Except for one path in the research model, the results from both techniques converged. Moreover, since different criteria are used to assess model fit, a rigorous assessment of the research model was conducted.

6.3.1.4.2 Alternative to the Use of Categorical Variables in SEM

SEM requires that the data be normally distributed to determine the relationships between the different variables (Chin and Newsted 1999) and more than often, models with categorical variables are considered to be in violation of the normality assumption. Moreover, a high degree of skewness is associated with categorical variables having less than five categories. Consequently, the inherent skewness leads to inflated χ^2, as well as unstable parameter estimates (West et al. 1995). Thus, based on these reasons, it was concluded that the use of categorical variables in SEM should be cautioned.

In this study, an alternative to the use of categorical variables in SEM has been suggested. The use of categorical variables in the testing of a structural model provides a better surrogate for the independent variables. The manipulation check provides a confirmation that the manipulation of the independent variables has been successful and therefore, integrating categorical variables in a structural model provides an objective measure, which does not entail any measurement error. However, since categorical variables cannot be integrated in a structural model when SEM is used, it is suggested that the perceptual measures used to check the manipulation of the independent variables should be used.

In this study, two perceptual measures which were better representatives of the independent variables were used in the structural model. The results generated using SEM were quite similar to those obtained when using PLS, where categorical variables were used. The use of the proxy variables in the assessment of the structural model was warranted. Thus, when the research model consists of both continuous and categorical latent constructs and the researcher is

constrained by the resources available for data analysis, he or she can effectively use a proxy variable instead of facing the risks involved with using categorical variables in SEM.

6.3.2 Practical Implications

The knowledge produced as a result of this research endeavor can be used to improve practice. The findings of this study are important and relevant to online retailers (e-retailers), online consumers, and website designers. The implications of this study for each of these entities are presented in the following subsections.

6.3.2.1 Implications to the e-Retailer

Based on this research, e-retailers may be able to design more effective marketing strategies to attract consumers and engage them in an impulsive behavior. As the results of the study show, to increase the likelihood that the online consumer will engage in an impulse purchase, negative cognitive reactions should be kept to a minimum through the availability of the high task-relevant cues, while maximizing the hedonic reactions to the interface through the presence of the low task-relevant cues.

Negative cognitive reactions can be minimized by the presence of the features associated with structural firmness and functional convenience. These features have been found to enhance the emotional aspect of the online experience, and concurrently, the occurrence of the impulse purchase. Moreover, the presence of these cues will be crucial at the ordering phase to maintain the positive reactions. Thus, by making the process of online shopping more easy and efficient, the likelihood of an online impulse purchase is increased. For instance, the one-click ordering feature provided by Amazon.com reduces the burdens placed on the customer in the ordering

process, thus reducing the likelihood of any negative cognitive reactions. With this feature, an approach behavior in the form of web browsing can, in a minute, lead to an impulse purchase.

Positive emotional reactions can be enhanced through the presence of the low task-relevant cues, in the form of the features associated with representational delight. The presence of these cues enhances the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001 value of the online experience. Since the impulse buying behavior is more emotional than rational (Rook 1987), the enhancement of the positive emotional reactions increases the likelihood that an impulse purchase will occur. For instance, iTunes allows the consumers to preview different songs, whereby the emotional aspect of the online experience is further enhanced, which can trigger the impulse buying process.

6.3.2.2 Implications to the Online Consumer

This research also makes a significant contribution to the society at large. If retailers use the findings from this study to increase the likelihood of impulse purchases, unsuspecting online consumers can become the easy targets of these e-retailers. This research can serve as a foundation to educate or inform online consumers about the potential dangers of online impulse buying by highlighting the strategies that enhance the likelihood of an impulse purchase occurring. The optimal solution is avoidance (Hoch and Loewenstein 1991), where the online consumers choose not to browse certain websites. However, this solution may not be plausible and thus, intervention strategies should be devised to prevent the online consumer from being impulsive.

The presence of the high task-relevant cues at the ordering phase aids in the occurrence

of an impulse purchase, once the urge to buy impulsively is triggered through the presence of the low task-relevant cues. Thus, any cognitive deliberation elicited at this point will act as an interruption in the online impulse buying process (Hoch and Loewenstein 1991). Several restraint strategies have been identified in an offline context, and these may also prove to be useful in an online context. These restraint strategies include precommitment and economic cost assessment (Hoch and Loewenstein 1991), as well as need reassessment (Shehryar et al. 2001).

The first identified restraint strategy is *precommitment*, whereby the consumer intentionally imposes constraints on future behavior (Hoch and Loewenstein 1991). In the context of online impulse buying, this would involve not registering to the website. Thus, the process of ordering a product on the spur of the moment is not possible. For instance, if an online consumer does not enter his or her credit card information at a website, this may act as an interruption in the impulse buying process. To complete the purchase process, the online consumer will have to look for a credit card, which would very likely give him or her to rethink the costs and benefits associated with being impulsive.

One of the restraint strategies that has been found to be particularly useful in resisting impulsive buying is the *conscious economic cost assessment* (Rook and Hoch 1985). When the consumer is driven by emotions, the consumer does not think of the economic consequences of being impulsive. Thus, in an online context, the presentation of a bank statement or the consequence of the impulsiveness in terms of its impact to the consumer's bank balance will put off the impulse purchase. However, the implications of such a restraint strategy to the security of sensitive information will have to be mulled over very carefully.

Impulse buying is an unplanned purchase, which implies that the consumer makes the purchase on the spur of the moment, not in response to a previously recognized problem or an intention that was formed prior to being in the shopping environment (Piron 1991). Thus, it is very likely that the consumer may not even need this product. *Need reassessment* refers to a strategy where the consumer is somehow brought to review the necessity of the product of interest before the impulse purchase is completed (Shehryar et al. 2001). This serves as an interrupt that alerts the consumer to the need of cognitive deliberations, which reduces the likelihood of an impulse purchase occurring as the behavior is no longer emotionally driven. In an online context, a possible feature that can be integrated at the checkout point is an avatar that forces the online consumer to rethink his or her behavior by pointing to need reassessment.

6.3.2.3 Implications to the Website Designer

Given the growth of e-commerce usage and competitiveness, effective website designs are necessary to maintain or increase a company's market share. Website designers always face difficult and often confusing tradeoffs when designing websites. The consumer's hierarchy of needs developed in the pilot study provides these design professionals with a clear rationale for prioritizing interface design projects in the face of finite resources. By acknowledging this hierarchy of needs, organizations can avoid putting the cart before the horse (e.g., emphasizing aesthetics before security or system response time). Furthermore, the latitude in how consumers perceive the importance of representational delight relative to structural firmness and functional convenience is of significance to practitioners. For instance, aesthetics is a reality for any website, but the extent, or lack thereof, that an organization emphasizes bells and whistles can be

accurately justified by acknowledging and understanding the consumer's zone of tolerance for the representational relight of an e-commerce interface.

Thus, if the e-retailer's intent is to increase impulse purchases, based on the results of this study, the website designer has concrete guidelines to which features need to be present. To decrease negative cognitive reactions, high task-relevant cues, in the form of structural firmness and functional convenience, should be provided. Since impulse buying is more emotional than rational (Rook 1987), the hedonic aspect of the website should also be enhanced by providing a creative, innovative, and visually appealing website. In contrast, if the goal of the website is for its entertainment potential, the presence of the low task-relevant cues will be enough to increase the enjoyment derived from interacting with the website. The mere presence of these cues gives an illusion of the presence of the high task-relevant cues. Thus, for hedonic websites, the presence of low task-relevant cues is imperative, while only an acceptable level of the high task-relevant cues is deemed to be sufficient.

6.4 Future Work

The aim of this research endeavor was to develop and test an online model of impulse buying. While the results from this study are interesting and provide a better understanding of the phenomenon of interest, they also point to the need for follow-up studies. The forthcoming subsections highlight some of the key research areas that need to be addressed.

6.4.1 Extension of the Technology Acceptance Model

Perceived usefulness and perceived enjoyment are important determinants in predicting the acceptance of information technologies (e.g, Van der Heijden 2004). The integration of these

two sets of beliefs in the proposed research model has led to intriguing findings which need further investigation. Each of these potentially profitable areas of research is discussed in the following subsections.

6.4.1.1 The Illusion of Aesthetics

An interesting finding is the unexpected strength of the relationship between the low task-relevant cues and perceived usefulness. The relationship between low task-relevant cues and perceived usefulness was observed to be as strong as that between these cues and perceived enjoyment. The consequences of aesthetics have been studied in psychology and marketing. It has been found that people associate more favorable attitudes towards attractive individuals or products (Dion et al. 1972). This finding is in line with that shown by Tractinsky and colleagues (2000) that "what is beautiful is usable".

There is a need to study this relationship between aesthetics and usefulness of a website. The mere presence of the low task-relevant cues in this study has led to an illusion about the presence of the high task-relevant cues, even though they were not present. This finding can be explained in reference to the online consumer's hierarchy of needs presented in this research. This hierarchy was developed to emulate Maslow's (1954) hierarchy of needs, which posits that humans have a hierarchy of five needs: physiological, safety, social, esteem, and self-actualization (see Figure 6.1). According to this hierarchy, as each lower-level need is adequately met, it becomes less important and higher-level needs become the individual's primary focus. Thus, if a person is trying to attain self-actualization, this implies that the lower level needs have already been met.

Figure 6.2: Comparing the Two Hierarchies of Needs
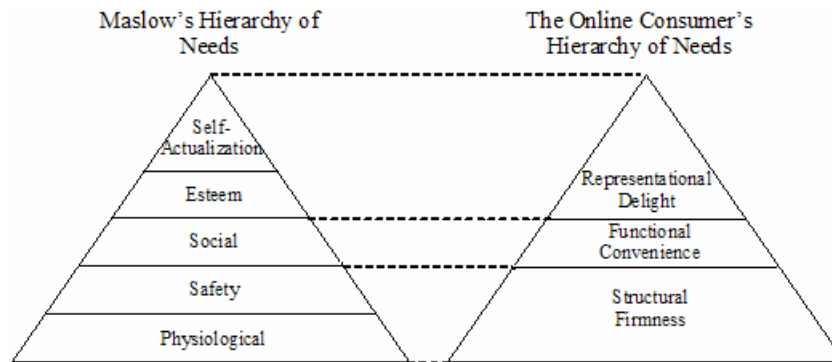
The same trend is believed to exist in the context of the online consumer's hierarchy of needs (see Figure 6.1). Since representational delight is the highest level need in the hierarchy, its presence creates the false impression that the lower level needs in the form of structural firmness and functional convenience would be present. Thus, the presence of the low task-relevant cues or representational delight is found to increase the usefulness of the website. An experimental design will be needed to test this relationship between aesthetics and usefulness of a website.

6.4.1.2 Acceptance of Hedonic and Utilitarian Information Systems

As predicted by the theoretical model, the usefulness of a website was shown to have a significant, positive influence on the enjoyment derived when interacting with the website. In this study, perceived usefulness was used as a surrogate for the cognitive reactions experienced when interacting with the website, while perceived enjoyment was a proxy for the emotional reactions. The influence of cognitions on affect has been proven in consumer behavior literature (e.g., Shiv and Fedorikhin 1999). A logical extension of this finding to the acceptance of hedonic information systems points to the possibility that the usefulness of a system will increase

perceived enjoyment and thus, perceived usefulness will be as important as perceived enjoyment in predicting the acceptance of hedonic information systems.

In this model, the influence of perceived enjoyment on perceived usefulness was not tested as impulse buying is predominantly an affective behavior. However, there is evidence of the influence of affect on cognitions (e.g., Shiv and Fedorikhin 1999). Thus, in the acceptance of a utilitarian website, it is believed that perceived enjoyment will influence the perceived usefulness of a website. These two propositions have important implications to the acceptance of information technologies. This interplay between cognitions and affect deserves further investigation.

6.4.1.3 Hedonic and Utilitarian Nature of Websites

The current research points to the fact that websites serve both hedonic and utilitarian purposes. It has been suggested that in order to be successful, a website should be able to support different consumer tasks (Huang 2003). The marketing literature has provided a dichotomy of tasks: *utilitarian tasks*, which are goal-oriented, and *hedonic tasks*, which are more experiential. Websites that provide a solution to a problem and are typically visited out of necessity would effectively support utilitarian tasks (Park and Moon 2003). Consumers pursuing such tasks select these sites based on their relative usefulness and support for solving the problem at hand (Van der Heijden 2004). In contrast, websites that effectively support more hedonic tasks are more experiential, entertaining, and gratifying to the senses (Van der Heijden 2004). Thus, users pursuing a hedonic task select these sites based on the amount of fun, playfulness, or pleasure experienced (Huang 2003). There is a need to develop clear guidelines on what interface features

need to be included in a website to support these different tasks.

6.4.1.4 Are all Intentions Created the Same?

In technology acceptance literature, the behavioral intention to use a system has been found to be an important determinant of its actual usage (Davis 1989; Davis et al. 1989). Depending on which tasks the online user is performing at the website, the intention of the user will differ. For instance, if the user is browsing a website, which is a hedonic task, he or she may engage in an impulse purchase as indicated in this study. For instance, when browsing a celebrity website, the online user can decide to buy some item related to the celebrity, but after owning the product, does not see the necessity of visiting that site again. Thus, this implies a short-term intention, whereby after the purchase, the consumer may not even visit the website again. On such websites, the presence of the low task-relevant cues is crucial to engage the consumer in making a one-time purchase.

In contrast, when the consumer is more goal-directed or wants to complete a utilitarian task, he or she may need to establish a long-term relationship at the website. For example, when paying bills on a website, the consumer will need to register so that he or she can come back for this transaction every month. On such websites, the presence of high task-relevant cues is essential. Thus, it is believed that behavioral intention consists of two layers, a short term component (one time shopping) and long term component (relationship intention). This proposition should be tested and would provide an important contribution to the body of knowledge on technology acceptance.

6.4.2 Improving Generalizability

This study was conducted in a laboratory setting, whereby precision was favored over generalizability and realism. Thus, a potential area of research involves improving the generalizability of the findings. In the following subsections, specific strategies are addressed.

6.4.2.1 Replication

Based on a laboratory experiment, the features that are necessary in increasing the likelihood of online impulse buying have been identified. Because of the focus on precision, the generalizability of the findings may be compromised. Now that an initial understanding of the phenomenon is gained through this study, the findings must be replicated in more natural settings to establish generalizability (Cook and Campbell 1979). In this study, the context used involves an e-commerce setting. The impulse buying phenomenon needs to be also studied in other contexts, such as mobile commerce, online gaming, or online auctions.

6.4.2.2 Longitudinal Studies

It is believed that after the impulse purchase occurs, the consumer experiences emotional and/or cognitive reactions, which can include guilt or disregard for future consequences. Because of the cross-sectional nature of this study, this aftermath effect of the behavior on the cognitive or emotional reactions cannot be studied. Thus, there is a need to study this behavior in longitudinal studies to establish the consequences of the impulse purchase and their impact on future behavior.

6.4.2.3 Development of a Comprehensive Model

Since this research agenda is in its early stage, a parsimonious research model was

developed to study the main effects of the independent variables on impulse buying. Now that support has been found for this theoretical model, there is a need to develop a more comprehensive model of online impulse buying. This would allow the researcher to investigate the influence of different moderators as well as any interaction effects between the variables being studied. Furthermore, in this study, various categories of interface characteristics were considered as the dependent variables. There is a need to study these interface characteristics to determine which features, at a finer granular level, lead to impulse buying.

6.4.3 The Design of Technological Features

In the Practical Implications section, several restraint strategies were identified to decrease the vulnerability of the online user. These different features should be developed and tested for their ability to interrupt the impulse buying process. Based on these findings, the feature which is the most effective in preventing the online impulse purchase can be offered to the customers so that they can regulate their impulsiveness.

6.5 Conclusion

This research endeavor presents a significant effort at integrating very diverse, yet complementary literature streams to develop a theoretical model that explains online impulse buying. The findings indicate that this study significantly contributes to a better understanding of impulse buying in an online context. Moreover, the results of this study suggest that two conditions enhance online impulse purchase behavior. First, any negative cognitive reactions should be minimized by ensuring that the website is secure and easy to navigate. Second, the emotional reactions to the interface should be maximized by using an innovative and creative

interface design.

The research provides clear guidelines as to what features need to be present on a website to increase the likelihood of an online impulse purchase occurring. First, the presence of the high task-relevant cues has been found to minimize any potential negative cognitive reactions. These cues have been represented by the features associated with structural firmness and functional convenience. The presence of security seals, security and privacy policies, and quick response times have been associated with structural firmness. Concurrently, the ease of use, ease of navigation, and functional fit to task are representative features of functional convenience. Second, the presence of the low task-relevant cues has been found to maximize the emotional reactions to the website. These features are represented by the features associated with representational delight. Thus, the emotional reactions to a website can be enhanced by providing a creative, innovative, and visually appealing website.

This research constitutes a stepping stone to the road to understand online impulse buying. The results of this study serve as a foundation upon which additional future research questions can be examined. The proposed model is theoretically grounded and a rigorous assessment of this model was conducted. Thus, the findings from this study are robust and the underlying theory developed in this model can be leveraged in the study of more specific phenomena, unearthing important variables in richer and more novel contexts. The use of two specific sets of beliefs from the literature on technology acceptance also points to intriguing relationships, which need to be studied in depth to provide valuable insight and contribute to this body of knowledge. Last but not least, an important contribution of this study involves the use of

two specific data analysis techniques in the assessment of the research model. The advantages of this approach have been identified and specific situations where this strategy will prove to be useful were suggested.

A multi-disciplinary approach was used to develop the proposed model. Support for the different relationships was drawn from information systems and two reference disciplines, namely consumer behavior and environmental psychology. Consequently, this research endeavor has the potential to make a great contribution to these reference disciplines. The theoretically grounded and empirically tested model of online impulse buying provided can be used as a strong foundation to study interesting phenomena within these fields of research.

The knowledge generated as a result of this research endeavor can also be utilized to better practice. e-Retailers and website designers have been provided with clear guidelines that will aid them in designing more effective marketing strategies as well as web interfaces that will attract consumers and engage them in an impulsive behavior. Furthermore, the present research endeavor can serve as a foundation to educate and inform online consumers about the potential implications of online impulse buying. Finally, different restraint strategies that apply to the online context have been suggested and these would act as an interrupt in the online impulse buying process.

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APPENDIX A

IMPULSE BUYING MEASURES

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IMPULSE BUYING MEASURES

This appendix provides the different measures that are available to measure impulse buying. In the next sections, the following measures will be provided: a measure for impulsive purchase behavior (Rook and Fisher 1995); the buying impulsiveness scale (Rook and Fisher 1995); the buying impulsiveness scale (Donthu and Gilliland 1996); the impulse tendency scale (Mick 1996); the consumer impulsiveness scale (Puri 1996); and the impulsive buying tendency (Weun et al. 1997).

A.1 Rook and Fisher's (1995) Measure of Impulsive Purchase Behavior

This is a one-item measure where respondents are forced to choose a behavior that a consumer described in an imaginary shopping situation should perform. The original scenario proposed by Rook and Fisher (1995) is as follows:

> *"Mary is a 21-year-old college student with a part-time job. It is two days before Mary gets her next paycheck and she has only $25 left for necessities. In addition to food, Mary needs to buy a pair of warm socks for an outdoor party this weekend. After work, she goes with her friend Susan to the mall to purchase the socks. As they were walking through Bullock's, Mary sees a great looking sweater on sale for $75."*

After reading this scenario, respondents were asked to select one of the following five alternatives, which range from low to high impulsiveness: (1) buy the socks only, (2) wanting the sweater, but not buying it, (3) deciding not to buy the socks, (4) buying both the socks and the

sweater with a credit card, and (5) buying these plus matching slacks and a shirt, also with a credit card. The assumption in this case is that respondents who are impulsive will project themselves in the situation and will more likely choose the most impulsive alternative as compared to the non-impulsive respondents (Rook and Fisher 1995). Moreover, with this approach, subjects will provide their 'true' response, because they will not be judged on their behavior (Fisher 1993).

A.2 Rook and Fisher's (1995) Buying Impulsiveness Scale

Rook and Fisher (1995) proposed a scale that consists of nine 5-point Likert-type items that measure "a consumer's tendency to buy spontaneously, unreflectively, immediately, and kinetically" (p. 306). The nine items are as follows:

1. I often buy things spontaneously.

2. "Just do it" describes the way I buy things.

3. I often buy things without thinking.

4. "I see it, I buy it" describes me.

5. "Buy now, think about it later" describes me.

6. Sometimes I feel like buying things on the spur-of-the-moment.

7. I buy things according to how I feel at the moment.

8. I carefully plan most of my purchases (reverse-coded).

9. Sometimes I am a bit reckless about what I buy.

A.3 Donthu and Gilliland's (1996) Buying Impulsiveness Scale

The measure proposed by Donthu and Gilliland (1996) measures the degree to which a person not only indicates that he or she engages in unplanned consumer choice, but likes to purchase in that way. The measure consists of the following four items based on a 5-point Likert-type scale:

1. I often make unplanned purchases.

2. I like to purchase things on a whim.

3. I think twice before committing myself (reverse-coded).

4. I always stick to my shopping list (reverse-coded).

A.4 Mick's (1996) Impulse Tendency Scale

This scale is intended to measure the extent to which a consumer is likely to make unplanned, immediate, and unreflective purchases. It is based on the following ten items on a 7-point Likert-type scale:

1. Even when I see something I really like, I do not buy it unless it is a planned purchase (reverse-coded).

2. When I go shopping, I buy things I had not intended to purchase.

3. I avoid buying things that are not on my shopping list (reverse-coded).

4. It is fun to buy spontaneously.

5. I do not buy until I can make sure I am getting a real bargain (reverse-coded).

6. When I see something new that really interests me, I buy it right away just to see what it is like.

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7. I buy some things without hesitation if I like them when I first see them.

8. When I see something new I really want, I purchase it immediately, even if I had not planned to buy it.

9. I am a person who makes unplanned purchases.

10. When I see something that really interests me, I buy it without considering the consequences.

A.5 Puri's (1996) Consumer Impulsiveness Scale

Puri (1996) offers this scale which measures "people chronic values towards impulsiveness" (p. 89). According to her, impulsive buying is a behavior that offers immediate hedonic benefits, but more serious long-term consequences. The measure proposed consists of two subscales, namely prudence and hedonic. The assumption is that people who score low on prudence subscale and high on hedonic subscale are impulsive. For the prudence subscale, respondents are presented with 7 adjectives on a 7 Likert-type scale and are asked to indicate how well each of these abjectives describes them. The adjectives for the prudence subscale are as follows:

1. Self-controlled (reverse-coded)

2. Farsighted (reverse-coded)

3. Responsible (reverse-coded)

4. Restrained (reverse-coded)

5. Rational (reverse-coded)

6. Methodical (reverse-coded)

7. A planner (reverse-coded)

The adjectives for the hedonic subscale are as follows:

1. Impulsive

2. Careless

3. Extravagant

4. Easily tempted

5. Enjoy spending

A.6 Weun et al.'s (1997) Impulse Buying Tendency Scale

This scale measures the "degree to which an individual is likely to make unintended, immediate, and unreflective purchases" (p. 306). This measure was considered as being better than the measure proposed by Rook and Fisher (1995), with better internal consistency, convergent validity and discriminant validity. The measure consists of the following five items on a 5- or 7-point scale:

1. When I go shopping, I buy things I had not intended to purchase.

2. I am a person who makes unplanned purchases.

3. When I see something that really interests me, I buy it without considering the consequences.

4. It is fun to buy spontaneously.

5. I avoid buying things that are not on my shopping list (reverse-coded).

APPENDIX B

PILOT STUDY RESULTS

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PILOT STUDY RESULTS

This appendix discusses the results obtained from two pilot studies, each of which is described separately in the sections below. The first section describes the results of a study carried out in August of 2004 to determine how online consumers prioritize electronic commerce (e-commerce) interface characteristics. This ranking allowed the researcher to classify the macro-categories proposed by Kim et al. (2002) as being low or high task-relevant.

The second section covers the pilot test for the online impulse buying experiment carried out in December, 2004. The objectives of the pilot study were to ensure the manipulation was salient, to refine the experimental procedures, to conduct a preliminary construct validation process, and to perform a preliminary test of the hypotheses. Based on the results of this pilot test, measures were taken to increase the internal validity of the experimental study.

B.1 Prioritizing Website Interface Characteristics

This appendix provides a review of a preliminary study that was carried out to determine how online consumers prioritize e-commerce interface characteristics. In the next section, the need for this study is presented along with the specific research objectives. The next section provides the research hypotheses that will be tested. The research methodology used is then discussed, followed by an analysis of the results. The final section provides the implications of these findings for both research and practice.

B.1.1 Justification for this Research

E-commerce interface characteristics have received considerable attention from the academic realm. The body of knowledge resulting from these studies has produced a collective, comprehensive set of website characteristics. Subsequently, there have been research efforts to validate the instruments that assess the overall quality of an e-commerce interface by gauging the effectiveness of each of these characteristics (e.g., SiteQual and WebQual). These instruments, while useful, leave out an important aspect of e-commerce interface evaluation, namely how the online consumer prioritizes these interface characteristics.

To date, there have been relatively few studies that have specifically focused on consumer ranking of e-commerce interface characteristics (Agarwal and Venkatesh 2002; Zhang and Von Dran 2001-2002). While these studies are insightful, they focus on specific business domains or lack certain key characteristics, such as security. Thus, an opportunity exists to present a parsimonious, comprehensive ranking of e-commerce interface categories that can explain how consumers prioritize interface characteristics and such a ranking can be effectively generalized across all business domains.

The research presented has two primary objectives. The first objective is to ascertain the order in which consumers prioritize these categories of interface characteristics. While it is important to understand which category is most important, understanding its relative importance when compared to other categories is also crucial. Thus, the second objective is to understand the relative magnitude of these general categories. This analysis will allow the development of a 'hierarchy of needs' that applies to e-commerce interface characteristics.

The website characteristic categories proposed by Kim et al. (2002) are used for this study. Based on the architectural literature, they developed three macro-constructs to "evaluate Internet businesses in the same systematic and rigorous manner as buildings" (Kim et al. 2002, p. 241). These are *functional convenience*, which refers to the availability of convenient features for the processing of transactions and interacting with the website; *representational delight*, which includes the aspects of the interface with which the consumer comes into contact; and finally, *structural firmness*, which refers to the ability of the system to overcome all expected and unexpected threats.

These categories are attractive for at least three reasons. First, they are parsimonious, making it easy to compare and contrast how consumers prioritize characteristics of e-commerce interfaces. Second, they are comprehensive and inclusive, making it easy to map specific interface characteristics to respective categories. Lastly, they provide an opportunity to present e-commerce interface characteristics as a 'hierarchy of needs', which implies a sequence of perceived importance (i.e., prerequisites) as the consumer moves from one category to another.

B.1.2 Research Hypotheses

Structural firmness relates to the security and stability associated with the website and includes interface characteristics such as system performance and system security (Kim et al. 2002). Security has been observed to be a top, if not THE top, priority for web users, particularly for e-commerce domains (Zhang and Von Dran 2001-2002). Also, download delay (i.e., system performance) is a characteristic that reflects the quality of an e-commerce interface (Palmer 2002). Thus, it is posited that structural firmness is perceived to be the most important e-

commerce interface category, when compared to representational delight and functional convenience.

P1: Structural firmness is the top consumer priority, being significantly more

important than both functional convenience and representational delight.

Functional convenience refers to the presence of convenient functions that help the processing of consumers' transactions and includes interface characteristics such as ease of use (Kim et al. 2002). Research in web usability has emphasized the importance of ease of use in the adoption of an e-commerce interface (Koufaris 2002). While functional convenience is not considered as important as structural firmness, features within this category are considered to be essential in the processing of transactions as well as in the interaction with the website. Thus, it is posited that functional convenience is less important than structural firmness, but still significantly more important than representation delight.

P2: Functional convenience is the second most important consumer priority and

is more closely aligned with structural firmness than representational delight.

Finally, representational delight refers to the aspects of the website with which the user comes into contact and includes interface characteristics such as aesthetics and graphical design (Kim et al. 2002). Researchers have drawn inferences between website aesthetics and traditional marketing atmospherics (Eroglu et al. 2001). While such characteristics affect consumer behavior, they are not crucial in the attainment of the consumer's shopping goal. Thus, representational delight is expected to be of relatively low priority for consumers, implying a

significant gap between this category and structural firmness or functional convenience. Thus, the following proposition is offered with respect to representational delight as a consumer need.

P3: Relative to structural firmness and functional convenience, representational delight is the least important consumer priority.

B.1.3 Research Methodology

To test the propositions, a survey was administered to a sample of college students. A multi-method approach was used to determine the order in which customers prioritize these categories of interface characteristics and the relative magnitude across these categories.

B.1.3.1 Subjects

Four hundred and eighty three participants were recruited from an introductory information systems course. Past research using similar populations indicated an average age of 20.6, with slightly more males than females. This sample is considered appropriate for this study, since college students are the heaviest Internet users (Hoffman et al. 2004).

B.1.3.2 Tasks

As indicated above, a multi-method approach was used to develop the online consumer's hierarchy of needs. The subjects performed four different tasks. The aim of the first task was to find out how consumers prioritize these categories of e-commerce characteristics. The subjects were presented with the definition of the macro-categories, namely functional convenience, representational delight, and structural firmness and were asked to rank them according to their importance to them in an online purchase. Table B.1 shows the instructions for the first task.

Table B.1: Instructions for Task 1

Task Instructions
Based on the provided definitions, please rank the following characteristics according to how important they are to you when you are making a purchase online. Please respond by putting the number 1 next to the most important characteristic, the number 2 next to the second important characteristic, and the number 3 to the least important characteristic. _____ Functional Convenience _____ Representational Delight _____ Structural Firmness

The aim of the second task was to determine the relative importance of each category when compared to the others. The subjects were presented with the definition of the different categories. Given two of these categories (e.g., structural firmness and functional convenience), they had to indicate which one was more important to them when making an online purchase on an eleven-item scale. If a score of 5 was chosen, this meant that one alternative was significantly more important than the other while a score of 0 meant that one was not more important than the other. Subjects were asked to compare three different sets of alternatives, as shown in Table B.2.

Table B.2: Instructions for Task 2

Task Instructions											
Based on the provided definitions, choose which of the following is most important to you when you are making a purchase online.											
	5	4	3	2	1	0	1	2	3	4	5	
Structural Firmness	○	○	○	○	○	○	○	○	○	○	○	Representational Delight
Structural Firmness	○	○	○	○	○	○	○	○	○	○	○	Functional Convenience
Functional Convenience	○	○	○	○	○	○	○	○	○	○	○	Representational Delight

In the third task, a zone of tolerance was determined for each of the three different categories of web site characteristics. Subjects indicated what level of the characteristic they

desired, and what was considered as adequate. They were presented with the six questions shown

in Table B.3. The response format comprised of an 11-point Likert-type scale anchored by 1

(Strongly disagree) and 11 (Strongly agree).

Table B.3: Instructions for Task 3

	Task Instructions
Please indicate your level of agreement with each of the statements below.	
1	When using an organization's website to purchase product/services online, I **desire** a high level of security to protect my data as well strong system performance (e.g., refresh rate).
2	When using an organization's website to purchase product/services online, I **desire** strong ease-of-use and functional convenience (e.g., efficient navigability).
3	When using an organization's website to purchase product/services online, I **desire** attractive aesthetics (e.g., graphics, colors) and a professional layout.
4	When using an organization's website to purchase product/services online, I can **tolerate** a low level of security to protect my data as well weak system performance.
5	When using an organization's website to purchase product/services online, I can **tolerate** weak ease-of-use and a lack of functional convenience (e.g., inefficient navigability).
6	When using an organization's website to purchase product/services online, I can **tolerate** unattractive aesthetics (e.g., graphics, colors) and an unprofessional layout.

This concept was proposed by Zeithaml and colleagues (1993) and is used in the service

quality research. According to this concept, a consumer has two levels of expectations, desired

and adequate. Desired expectations represent the level of service a consumer desires to receive.

In contrast, adequate expectations represent lower levels of expectations which are considered as

acceptable (Zeithaml et al. 1993). The difference between these two levels of expectations is the

zone of tolerance, which is "the extent to which consumers recognize and are willing to accept

heterogeneity" in the provided service (Zeithaml et al. 1993, p. 6). The consumer's expectations

are therefore bounded by these two levels of expectations.

The aim of the last task was to develop a more complete hierarchy of needs by including

different features of the website under the general categories, which include functional

convenience, representational delight, and structural firmness. Subjects were asked to map different features under these categories. Items from the WebQual (Loiacono et al. 2002) measure were used for this purpose (see Table B.4). Given the definitions of the different categories of web site characteristics, the subjects were asked to determine to which general category the different items belonged.

Table B.4: Instructions for Task 4

	Instructions
	Based on the provided definitions, classify these statements, which pertain to a purchase process, under the three categories.
1	The information on the website is what I need to carry out my tasks, effectively meeting my information needs.
2	The website has features tailored to my specific needs, helping me accomplish my task.
3	I feel safe in my transactions with the website and am confident that my personal information is secure.
4	There is very little waiting time between my actions and the website's response
5	The display pages are easy to read and the text in the website is easy to understand.
6	I find the website easy to use, which would make it easy for me to become skillful at using it.
7	The web site has design that is visually pleasing.
8	The design of the web site is creative and innovative.
9	I feel happy and cheerful when I use the web site.
10	The web site projects an image consistent with the company's image.
11	The web site is designed to allow transactions online.
12	It is easier to use to complete my business online than it is to telephone or mail a representative

B.1.3.3 Procedure

The study was conducted in a controlled laboratory setting and subjects received course credit for this scheduled research. Subjects entered the computer room and were evenly dispersed around the room. Several sessions were carried out and on average, 35-40 subjects participated in each session, which was administered by the same researcher. The researcher introduced herself and gave specific instructions to the subjects. All phases of the study were available online and

the subjects were given the address of this website, where they 'signed' the consent form by entering their student identification number. They then performed the different tasks, after which they were debriefed and thanked for their participation.

B.1.4 Results and Discussion

The aim of the first task was to find out how consumers prioritize the different categories of e-commerce interface characteristics. It was proposed that structural firmness is the first priority (P1), followed by functional convenience (P2), and finally, representational delight (P3). The results from the study support this categorization. 54.87% of the sample chose structural firmness to be most important, 52.80% indicated that functional convenience was the second important characteristic, and finally, 71.01% categorized representational delight as the least important. Thus, structural firmness is considered as important as functional convenience while representational relight is of relatively low priority for consumers, thus providing more support for the propositions.

Based on the results from the first task, the online consumer's hierarchy of needs was proposed (see Figure B.1). As indicated by the web consumers surveyed, the most basic need of an online consumer is structural firmness, followed by functional convenience and finally, representational delight. When designing interfaces, web designers should ensure that the features related to structural firmness and functional convenience are present first, before providing those associated with representational delight.

The goal behind the second task was to determine the relative importance of each category when compared to the others. It was proposed that structural firmness would be more

closely aligned with functional convenience (P2), while there would be a significant gap between representational delight and any of the other two characteristics (P3). These propositions were supported by the data. Significance tests were used to determine whether the relative importance was significantly different from a score of 0.

Figure B.1: The Online Consumer's Hierarchy of Needs

RD: Representational Delight

FC: Functional Convenience

SF: Structural Firmness
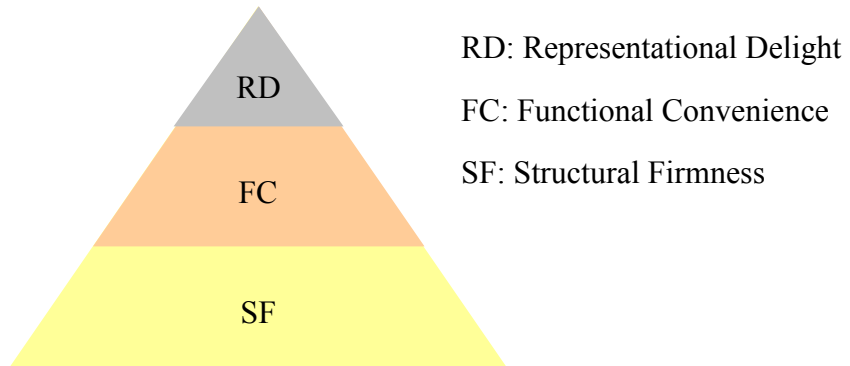
As shown in Figure B.2, there was a tight relationship between structural firmness and representational delight. However, structural firmness was considered slightly more important than functional convenience (mean = 0.72, t(482) = - 5.17, p = 0). Representational delight was considered to be less important than structural firmness (mean = 1.71, t(482) = - 18.51, p = 0) and functional convenience (mean = 2.30, t (482) = - 13.44, p = 0).

**Figure B.2: Relative Importance of the Different Categories**
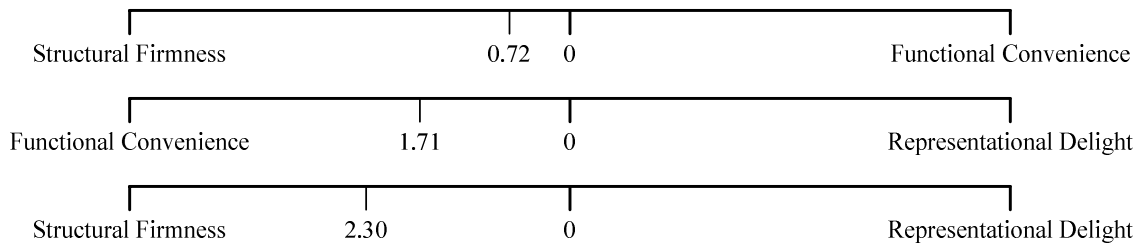
An interesting finding is that when both structural firmness and functional convenience were compared to representational delight, structural firmness is still more important than

functional convenience (mean = 0.59, t(482) = - 4.52, p = 0). These results provide more support

for the three propositions.

The goal of the third task was to develop a zone of tolerance for each of the three

categories of web site characteristics (see Figure B.3). On an eleven-point scale, the desired

expectations were 9.98, 9.39, and 7.51 for structural firmness, functional convenience, and

representational delight respectively while the adequate expectations were 9.56, 8.58, and 6.31

for structural firmness, functional convenience, and representational delight respectively.

Figure B.3: Zone of Tolerance for the Different Categories

RD: Representational Delight

FC: Functional Convenience

SF: Structural Firmness
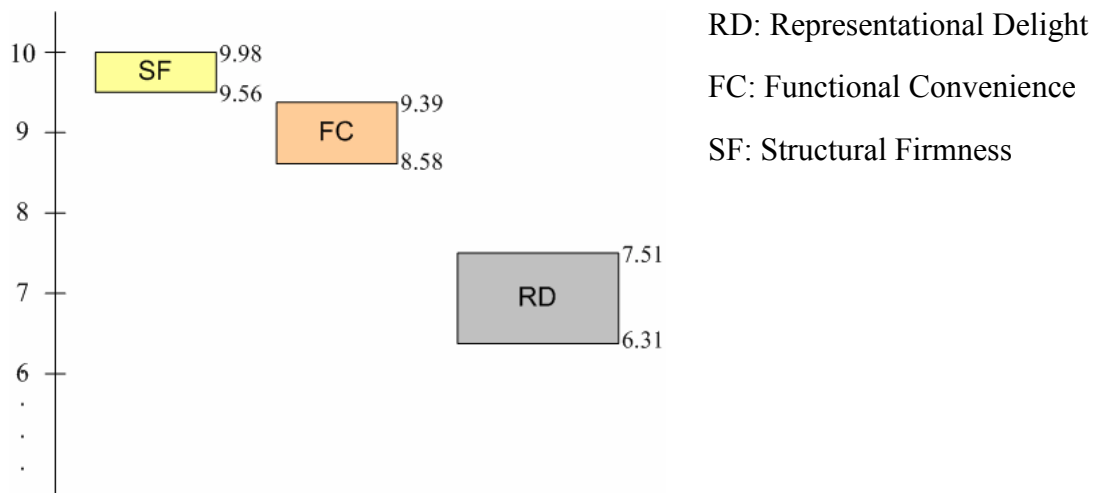
The difference between the desired and adequate expectations was significant for

functional convenience (mean = 0.81, t(482) = 8.38, p = 0), representational delight (mean =

1.21, t(482) = 9.58, p = 0), and structural firmness (mean = 0.42, t(482) = 4.95, p = 0). Structural

firmness has the narrowest zone of tolerance (0.42), followed by functional convenience (0.81),

and representational delight (1.21). The ranking order from the first task is also evident here and

consistent with the results of the second task, functional convenience and structural firmness are more closely aligned together than with representational delight.

The aim of the last task was to develop a more complete hierarchy of needs by including different features of the web site under the three general categories. Table B.5 lists the different items, the category each item was mapped to, and the percentage of the sample who mapped that particular item to the category.

Table B.5: Mapping of the WebQual Items

	Instructions	Macro-Category	% of Subjects
1	The information on the website is what I need to carry out my tasks, effectively meeting my information needs.	Functional convenience	82.82
2	The website has features tailored to my specific needs, helping me accomplish my task.	Functional convenience	54.24
3	I feel safe in my transactions with the website and am confident that my personal information is secure.	Structural firmness	94.82
4	There is very little waiting time between my actions and the website's response	Structural firmness	53.21
5	The display pages are easy to read and the text in the website is easy to understand.	Representational delight	68.74
6	I find the website easy to use, which would make it easy for me to become skillful at using it.	Functional convenience	85.51
7	The web site has design that is visually pleasing.	Representational delight	94.61
8	The design of the web site is creative and innovative.	Representational delight	88.41
9	I feel happy and cheerful when I use the web site.	Representational delight	74.12
10	The web site projects an image consistent with the company's image.	Representational delight	63.56
11	The web site is designed to allow transactions online.	Functional convenience	56.11
12	It is easier to use to complete my business online than it is to telephone or mail a representative	Functional convenience	79.30

Based on the results from this task, the hierarchy of needs was updated with the different features to provide a more complete hierarchy of needs as shown in Figure B.4.

Figure B.4: The Online Consumer's Hierarchy of Needs
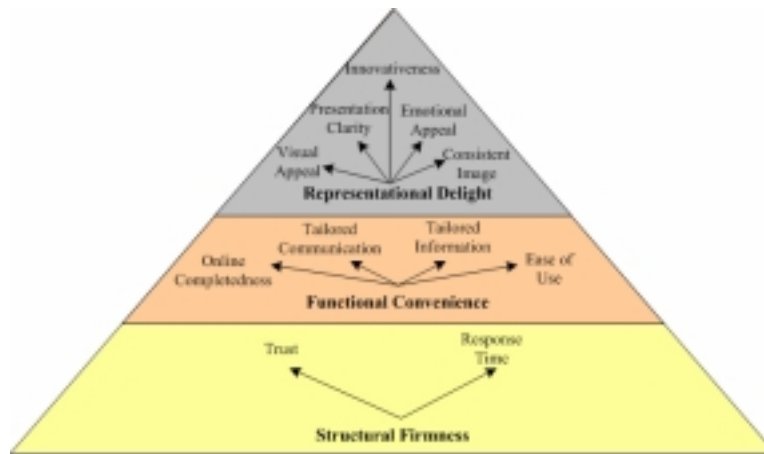
B.1.5 Implications for Research and Practice

The study provides support for structural firmness and functional convenience being very important in the online consumer's shopping goal attainment, while representational delight was not considered as important. In the context of online shopping, characteristics of e-commerce have been categorized as high and low task-relevant cues (Eroglu et al. 2001). High task relevant cues include "all the site descriptors which facilitate and enable the consumer's shopping goal attainment" (p. 142). Since both structural firmness and functional convenience are important in the attainment of the consumer's shopping goal, they are considered as being high task-relevant. Conversely, low task-relevant cues refer to "the site information that is relatively inconsequential to the completion of the shopping task" (p. 142). Since representational delight is not directly related to the purchase, it is proposed that this web site characteristic is a low task-relevant cue.

The results from this research provide implications for both academicians and practitioners with a more focused conceptual and theoretical view of how online consumers perceive and prioritize different categories of e-commerce interface characteristics. From an

academic perspective, the proposed e-commerce categories are attractive from a conceptual framework perspective as they are relatively parsimonious and arguably orthogonal. Using these prioritized categories, researchers are provided with a stronger orientation as they consider specific design characteristics within each category and frame them as potential independent and control variables. Moreover, by qualifying the categories hierarchically, an opportunity exists to understand the possible interaction between these categories. For example, does representational delight influence structural firmness of an e-commerce interface?

From a practitioner perspective, this research study provides two key insights. First, the consumer's hierarchy of needs proposed provides web designers with a clear rationale for prioritizing interface design projects in the face of finite resources. By acknowledging this hierarchy of needs, organizations can avoid putting the cart before the horse (e.g., emphasizing aesthetics before security or system response time). Second, the latitude in how consumers perceive the importance of representational delight relative to structural firmness and functional convenience is of significance to practitioners. For instance, aesthetics is a reality for any website, but the extent to which an organization emphasizes bells and whistles can be accurately justified by acknowledging and understanding the consumer's zone of tolerance for the representational delight of an e-commerce interface.

B.2 Online Impulse Buying Experiment

To ensure a valid study, it has been suggested that pilot studies should be conducted to address any issues associated with the task or the constructs used (Jarvenpaa et al. 1985). Therefore, a pilot study was conducted to ensure that the manipulation was salient, to refine the

experimental procedures, to conduct a preliminary construct validation process, and to perform a preliminary test of the hypotheses. Three hundred and forty-nine subjects were recruited from an introductory marketing class to participate in this pilot study. Subjects signed up for the experimental sessions and fifteen to twenty subjects participated in each session. The pilot study was conducted in a computer laboratory with the workstations located next to each other. The sessions were conducted by the principal researcher as well as research assistants in the marketing department. The sessions were conducted over a five-day period.
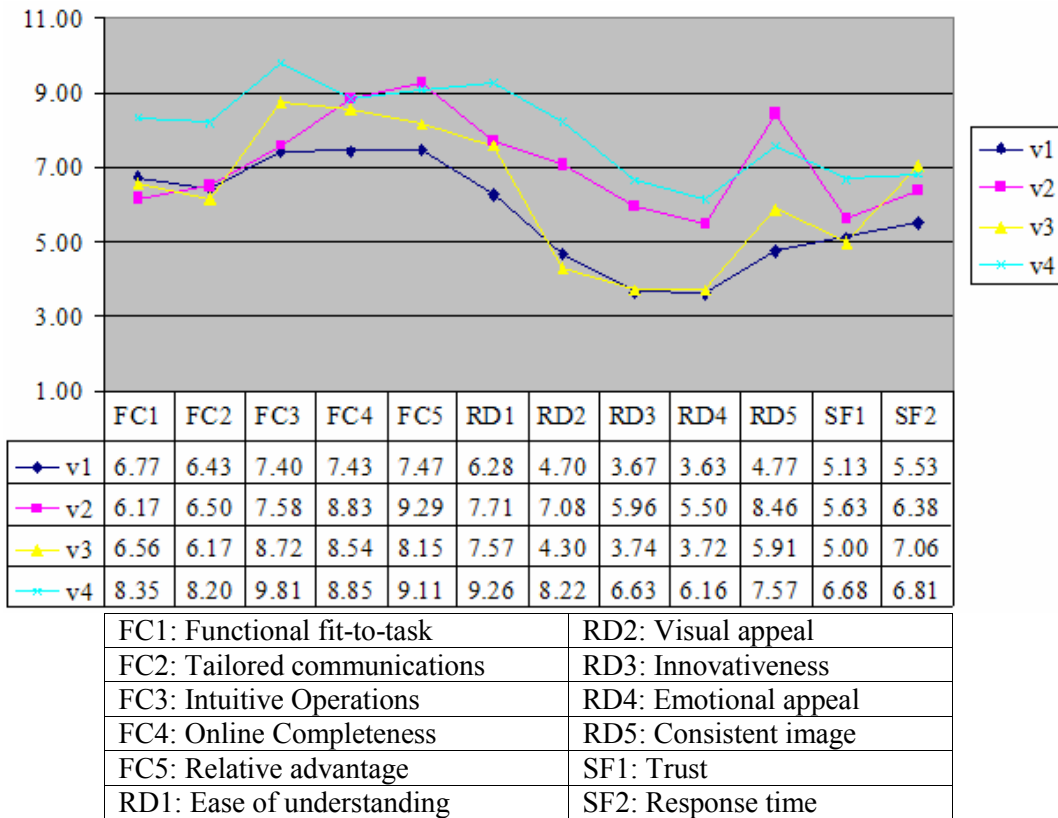
B.2.1 Confirming the Manipulation

The subjects were exposed to one of four interfaces: one which contained neither the high task-relevant cues nor the low task-relevant ones (v1), the second included only the low task-relevant cues (v2), the third one only contained the high task-relevant cues (v3), and finally, the last one contained both the low and high task-relevant cues (v4). After assessing the website, the subjects completed a questionnaire that contained the manipulation checks and the dependent variables. For the manipulation check, the items from the WebQual (Loiacono et al. 2002) measure were used. In the preliminary study, these items were mapped to the three categories of website interface characteristics. Thus, this classification was used to determine whether the manipulations of functional convenience, representational delight, and structural firmness worked. An 11-point Likert-type scale was used to capture the subjects' responses. The means for the subconstructs from WebQual are presented in Figure B.5 along with the categorization.

Univariate analyses of variance were performed to confirm the manipulation of the independent variables. The results of these analyzes are depicted in Table B.6. After analyzing

these results, it can be concluded that except for online completeness, the manipulation of the other features were valid at the $\alpha = 0.05$ level. However, when looking at the means, they were not representative of the manipulations within the different websites. For instance, for response time, the scores for the different websites regressed to the mean.

Figure B.5: Manipulation Check

	FC1	FC2	FC3	FC4	FC5	RD1	RD2	RD3	RD4	RD5	SF1	SF2
v1	6.77	6.43	7.40	7.43	7.47	6.28	4.70	3.67	3.63	4.77	5.13	5.53
v2	6.17	6.50	7.58	8.83	9.29	7.71	7.08	5.96	5.50	8.46	5.63	6.38
v3	6.56	6.17	8.72	8.54	8.15	7.57	4.30	3.74	3.72	5.91	5.00	7.06
v4	8.35	8.20	9.81	8.85	9.11	9.26	8.22	6.63	6.16	7.57	6.68	6.81

FC1: Functional fit-to-task	RD2: Visual appeal
FC2: Tailored communications	RD3: Innovativeness
FC3: Intuitive Operations	RD4: Emotional appeal
FC4: Online Completeness	RD5: Consistent image
FC5: Relative advantage	SF1: Trust
RD1: Ease of understanding	SF2: Response time

This incongruity in findings can be attributed to a number of factors. First, it is believed that there was not much control over the research setting. The computer screens were located very closely to each other, which increased the threat of diffusion. In fact, many subjects were talking to each other during the sessions and looking at each other's screen. Furthermore, there was confounds, such as gender effects, because the sessions were conducted by different people.

Second, the number of subjects per treatment group may have introduced confounds. There were

168 subjects for v3 and 163 for v4, but only 10 and 8 respectively for v1 and v2. Thus, the means

for v1 and v2 may not be reliable because of the small number of subjects' responses. In the

main study, better control of the experimental setting is imperative. The researcher also

determined that a different computer room would have to be used to control for threats of

diffusion. Moreover, smaller groups should be used to assign the subjects evenly to the different

experimental groups. These measures will be discussed in the Lessons Learned section.

Table B.6: Results of Univariate Analyses of Variance

Categories	Subconstruct	F-value	P
Functional convenience	Functional fit-to-task	39.22	< 0.001
	Tailored communications	53.93	< 0.001
	Intuitive Operations	30.98	< 0.001
	Online Completeness	1.72	0.191
	Relative advantage	15.97	< 0.001
Representational delight	Ease of understanding	58.99	< 0.001
	Visual appeal	209.72	< 0.001
	Innovativeness	125.00	< 0.001
	Emotional appeal	91.46	< 0.001
	Consistent image	42.04	< 0.001
Structural firmness	Trust	28.06	< 0.001
	Response time	5.50	0.020

Therefore, only the table of means was used in the assessment of the manipulation check.

The manipulation of representational delight was effective as evidenced by the differences

between the scores for the websites which contained the low task-relevant cues and those that did

not. For functional convenience, only the manipulation of intuitive operations was strong. For the

other features, the perceptions did not match the manipulations on the different interfaces. As for

structural firmness, the download delay of 4 seconds was effective. The perceptions of trust did

not match the manipulations on the different interfaces. The manipulations of the high task-relevant cues would have to be made more salient for the final study.

B.2.2 Refining the Experimental Procedures

There was a major problem with the interfaces that had download delay. In one of the sessions conducted, all the subjects were assigned to one of the treatment groups, where the high task-relevant cues were absent. Because these subjects were all trying to access the server at the same time when interacting with the experimental interface, the server was considerably bogged down, which caused multiple errors when interacting with the websites. The subjects had various products in their shopping carts, even though they never "purchased" them. To avoid this situation for the final study, for two of the treatment groups (v1 and v2), only 6-7 subjects participated at one time in the research session.

A few minor issues arose during the sessions, which necessitated the re-examination of the experimental procedure before starting the final study. There were some inconsistencies between the information given in the task sheet and the information available on the interface. For example, for websites which did not contain the high task-relevant cues, "Place Order" was used instead of a "Shopping Cart". Similarly, in v4, when clicking on the "Accessories", a new window popped up. Therefore, for the task sheet for v4, it was essential to instruct the subjects to close this window before moving on. To control for confounds, changes were made to the task sheet only after the data was collected. The researcher ensured that the information presented on the task list matched that on the different interfaces. This required the development of four different task lists as shown in Appendix E.

The setting of the computer laboratory encouraged interaction, because of the proximity of the workstations. On several occasions, it was noted that subjects were not giving their full attention to the research study. Instead, they were talking to each other, or even reading the newspaper. The experimental script was modified to account for these issues. More specifically, subjects were asked not to talk to each other or look at other people's screen during the duration of the research session (see Appendix G). The researcher also determined that a different computer room would have to be used to control for threats of diffusion.

B.2.3 Conducting a Preliminary Construct Validation Process

The primary purpose of the construct validation process was to assess whether the items of the dependent variables accurately represented the constructs. The research endeavor uses four existing measures for the dependent variables, namely the attitude towards the website, the pleasure, arousal, and dominance (PAD) dimension, approach/avoidance behaviors, and the impulse buying behavior. Before using these measures in the final study, it was essential to determine their psychometric properties within the context of online impulse buying.

Since the impulse buying measure consisted of only one item, it was not included in the factor analysis. Separate analyses were conducted for each measure. Using SPSS, the responses from the three hundred and forty-nine subjects were factor analyzed using principal component analysis as the factor extraction method. When the factors emerged, varimax rotation was used to generate a solution that can be interpreted easily. In the next subsections, a small description of the different dependent variables is presented along with the results of the factor analysis.

B.2.3.1 Attitude towards the Website

When exposed to the stimulus in the environment, the individual experiences emotional and cognitive states (Eroglu et al. 2001). The cognitive state can be conceptualized along several dimensions, which include attitudes, beliefs, attention, comprehension, memory, and knowledge. Recently, Eroglu and colleagues (2003) used attitude in a study where they test the effect of environmental cues on shopping behaviors. In the pilot study, attitude towards the website was used to capture the cognitive reactions.

Table B.7: Attitude towards the Website

	Items	Factor Loadings	Reliability
att1	This website makes it easy for me to build a relationship with the company.	0.71	0.87
att2	I feel comfortable in surfing this website.	0.73	
att3	I would like to visit this website again in the future.	0.85	
att4	I'm satisfied with the service provided by this website.	0.86	
att5	I feel surfing this website is a good way for me to spend my time.	0.65	

Attitude towards the website is a measure of the predisposition to respond favorably or unfavorably towards the website (Kim and Stoel 2004). The measure used for this study was from Chen and Wells (1999) and consisted of five items. An 11-point Likert-type scale was used to capture the subjects' responses. As indicated in Table B.7, factor loadings ranged from 0.65 to 0.86. These items loaded at appropriate levels of 0.60 (Chin et al. 1997). The α-coefficient was 0.87, which is considered as acceptable (Nunnally and Bernstein 1994).

B.2.3.2 PAD Dimension

It has been recommended that information systems researchers should use constructs which have been well established in the reference disciplines (Straub 1989). Therefore, in

accordance with Mehrabian and Russell's (1974) work, the PAD dimension, which captures the affective reactions to the stimulus, is used. This dimension consists of twelve semantic differential items, with five items for pleasure, 4 items for arousal, and 3 items for dominance. The subjects were asked to indicate how they felt when interacting with the website. An 11-point Likert-type scale was used to capture the subjects' responses.

Table B.8: PAD Dimension

Dimension		Items	Factor Loadings	Reliability
Pleasure	pad1	Unhappy/Happy	0.90	0.95
	pad2	Annoyed/Pleased	0.90	
	pad3	Unsatisfied/Satisfied	0.90	
	pad4	Melancholic/Contented	0.85	
	pad5	Despairing/Hopeful	0.84	
Arousal	pad6	Calm/Excited	0.72	
	pad7	Sluggish/Frenzied	0.70	
	pad8	Dull/Jittery	0.76	
	pad9	Unaroused/Aroused	0.79	
Dominance	pad10	Controlled/Controlling	0.49	Dropped
	pad11	Submissive/Dominant	0.47	
	pad12	Guided/Autonomous	0.24	

As indicated in Table B.8, factor loadings ranged from 0.24 to 0.90. Except for the items related to the dominance subdimension, all the factors loaded at appropriate levels of 0.60 (Chin et al. 1997). After the three items related to dominance were dropped, the resulting measure showed acceptable reliability (Nunnally and Bernstein 1994).

Since the loadings for the items related to dominance were below the acceptable level of 0.60, they had to be dropped. This is consistent with the results from several studies carried out in environmental psychology (e.g., Eroglu et al. 2003). While the resulting measure (i.e., excluding the dominance dimension) is parsimonious and easy to use, it does not fully capture

the gamut of possible emotional reactions (Eroglu 1987; Machleit and Eroglu 2000). Consequently, it has been suggested that researchers should use a more comprehensive set of emotions (Eroglu et al 2001) or should use internal states that are "hypothesized to be relevant in their specific research context" (p. 181). Therefore, it was concluded that a new measure would need to be identified for the final study.

B.2.3.1 Approach/Avoidance Behaviors

Approach behaviors are any positive actions directed toward the environment, such as intention to play, explore, and affiliate, while avoidance behaviors are the exact opposite (Mehrabian and Russell 1974). The measure was adapted from the original work by Mehrabian and Russell (1974) to reflect the interaction with the website. The measure consisted of four semantic differential items on an 11-point fully anchored scale. As shown in Table B.9, the factor loadings ranged between 0.79 and 0.93 and were considered as acceptable (Chin et al. 1997). The measure had acceptable reliability, since it was higher than the recommended 0.70 (Nunnally and Bernstein 1994).

Table B.9: Approach behaviors

	Items	Factor Loadings	Reliability
ab1	How much time would you like to spend with this website? Very little/lots	0.79	0.93
ab2	Once at the site, how much did you enjoy exploring around? Very little/lots	0.89	
ab3	How much would you like to either approach or avoid this particular site while shopping? Avoid/approach	0.92	
ab4	How much would you avoid looking around or exploring this site? Avoid/approach	0.93	

### B.2.4 Preliminary Hypothesis Testing

Using the data from the pilot study and AMOS Graphics 4.01, the research model was empirically tested. Based on the manipulation checks, download delay was the best representative of high task-relevant cues, while visual appeal was the best representative for the low task-relevant cues. Therefore, these two variables were used as proxies for the independent variables in the model.

An analysis of the fit indices reveals that acceptable fit was not observed. The χ^2 statistic was 1049.58 with 269 degrees of freedom. Thus, the ratio of χ^2 to degrees of freedom was 3.90, which was above the recommended 3:1 (Chin and Todd 1995). The GFI was at 0.78, NFI at 0.89, CFI at 0.91, and the RMSEA at 0.091. For acceptable fit, the GFI, NFI, and CFI should be above 0.90 (Gefen et al. 2000). Only the CFI was acceptable, though the NFI was pretty close to the threshold. The RMSEA should be at or below 0.08 (Jarvenpaa et al. 2000). Again though the observed index was not acceptable, the value is close to the cutoff point. It is believed that with better control over the experimental setting, these indices will be stronger. Furthermore, except for the link between high task-relevant cues and the PAD dimension, all the paths in the model were significant at the $\alpha = 0.01$ level, as shown in Figure B.6.

H_1 predicts that the high task-relevant cues will have a greater effect on the attitude towards the website than on the PAD dimension. The data supported this hypothesis. In the case of H_2, the relationship between the low task-relevant cues and the PAD dimension was expected to be stronger than the one between these cues and the attitude toward the website. The data did not provide support for this hypothesis. As for H_3, it was proposed that there would be a

relationship between the attitude towards the website and the PAD dimension. More specifically, the cognitive reactions would have an enhancing effect on the PAD dimension. Support was found for this hypothesis. As expected, approach/avoidance behaviors mediate the relationship between the PAD dimension and the impulse buying behavior, providing support for H_4 and H_5.

Figure B.6: Research Model
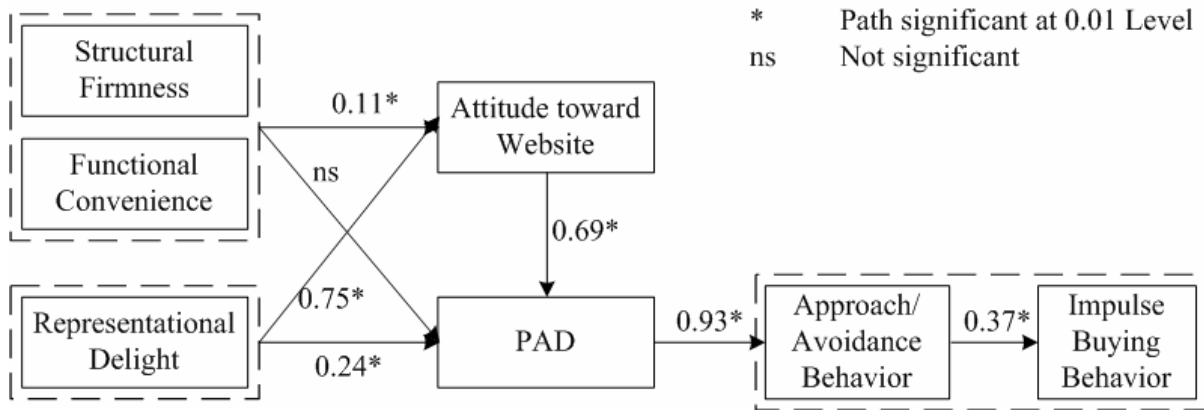
B.2.5 Lessons Learned

To ensure a valid study, it has been suggested that pilot studies should be conducted to address any issues associated with the task or the constructs used (Jarvenpaa et al. 1985). Through revisions of the experimental design, the researcher can ensure that the internal validity of the study is increased. This pilot study was carried out to ensure the manipulation of the independent variables was salient, to refine the experimental procedures, to conduct a preliminary construct validation process, and to perform a preliminary test of the hypotheses. Based on the results of this pilot study, several measures were taken to enhance the internal validity of this study. These measures are discussed in the next subsections.

B.2.5.1 Better Control over the Research Setting

The most important lesson learned from the pilot study was that the researcher should have absolute control over the experimental setting. This pool of subjects was a convenience sample, which was accessible to the researcher when the need for a pilot study was being considered. However, since the research sessions were being conducted in the marketing department and the researcher was from a different department, she did not have much influence on the way the research was being conducted. For instance, because of the manipulation of download delay, the researcher suggested that the subjects will be directed to a different room to participate in the study on online impulse buying. However, the researchers who were also using these students as subjects did not like the idea of burdening the students with this move. Consequently, the quality of the data suffered.

For the final study, the researcher decided to use the resources that were available within the information systems department. This included the use of a computer laboratory which contained 48 networked computer stations with LCD pop-up screens. As compared to the previous setting, the workstations in this computer laboratory were more evenly dispersed, allowing more space between two subjects sitting next to each other (see Figure B.7). This configuration by itself provided more control over the experimental setting as subjects could not easily look at each other's screen, thus reducing the threats to internal validity due to diffusion. Moreover, by running smaller sessions, with no more than 18 subjects, the students could be dispersed across the room, making it even harder for them to see each other's screens or to talk to each other. By doing so, any threats to internal validity due to diffusion were further reduced.

Figure B.7: Comparison of the Computer Labs Used

(Source: College of Business and Economics Website at Washington State University)

Computer Lab Used for Pilot Study Computer Lab Used for Final Study

Students from an introductory information systems class were used for the final study. Typically, when using this sample, researchers would conduct any research sessions during the normal class times. Consequently, in each session, there would be up to 45 students. This would again create the same conditions as in the pilot study. Therefore, one of the dissertation committee members approached the instructor teaching this class to determine whether it would be appropriate to conduct these research sessions outside of normal class times. The instructor agreed to this proposition. The researcher thus had control over the number of participants in the research sessions. This allowed better management of the research sessions where the interfaces which had download delay were used. Thus, for two of the treatment groups (v1 and v2), only 6-7 subjects participated at one time in the research session.

B.2.5.2 Stronger Manipulations

The manipulation of the high task-relevant relevant cues was not as effective as intended. For functional convenience, only the manipulation of intuitive operations was strong. For the

other features, the subjects' perceptions did not match the manipulations on the different interfaces. To increase the differences, the ease of using the website could be decreased, making the process of interacting with the website very cumbersome. However, this was not sensible as the resulting interfaces would not be realistic. Therefore, no changes were made. It was also believed that with better quality data, the difference between the interfaces will be more evident.

Within structural firmness, security has been identified as the most important feature in e-commerce (Zhang and Von Dran 2001-2002). In the interfaces, security was manipulated through the presence or absence of a security and privacy policy. Thus, for interfaces that did not contain the high task-relevant cues (v1 and v2), the security and privacy policy was not included on the interfaces and the subjects were pointed to this lack of information. However, the subjects did not perceive this lack of information as an indication of a lack of security and consequently, the manipulation of security was not strong enough, as evidenced by the manipulation checks.

The security information provided on the interfaces was altered to make the manipulation more salient. Security was manipulated through the nature of information provided in the security and privacy policy and the provision of security seals at the checkout stage. For interfaces v1 and v2, no security seals were provided and the security information provided raised concerns about security (see Table B.10). In contrast, for interfaces v3 and v4, security seals were provided at checkout and the web retailer ensured the protection of the consumer's information (see Table B.11). This manipulation worked better (discussed in Chapter 5).

Table B.10: Totebags.com Privacy Policy for Interfaces v1 and v2

Last updated: August 18, 2003

Totebags.com knows that you care how your information is used and shared. The following information describes our privacy policy in more detail.

How Secure Is Information About Me (Payment/Transaction Information)?

We attempt to take reasonable precautions to protect your privacy and to secure your sensitive information (e.g., credit card number). However, given the widespread fraud and identity theft that is occurring via the Internet, Totebags.com cannot guarantee that your private and sensitive information is 100% secure and does not assume responsibility should such information become compromised.

What Personal Information About Customers Does Totebags.com Gather?
The information we learn from customers helps us personalize and continually improve your shopping experience at Totebags.com. Here are the types of information we gather:

Information You Give Us: We use this information for such purposes as responding to your requests and customizing future shopping for you. For your order to be processed, it is essential that you provide ALL the requested information.

Automatic Information: We receive and store information whenever you interact with us through the use of cookies.

Information from Other Sources: We might receive information about you from other sources and add it to our account information.

Does Totebags.com Share the Information It Receives?

Information about our customers is an important part of our business. Totebags.com considers customer information to be an organizational asset. Thus, we reserve the right to sell information to various third parties and to use customer information as a means of revenue generation. Here are some ways we share information collected about you:

Agents: We employ other companies to perform functions on our behalf. They have access to your personal information and may use such information for other purposes (e.g., market analysis).

Promotional Offers: Sometimes we send offers to Totebags.com customers on behalf of other businesses.

Business Transfers: In the event that we might sell or buy business units, your information is one of the transferred business assets and is subject to the Privacy Policy of the acquiring organization.

Table B.11: Totebags.com Privacy Policy for Interfaces v3 and v4

Last updated: January 18, 2005

Totebags.com knows that you care how your information is used and shared, and we cultivate your trust carefully and sensibly. To ensure a high level of trust and privacy, Totebags.com is endorsed by TRUSTe® and Verisign®, two leading online consumer advocacy organizations: TRUSTe® is an independent, nonprofit organization dedicated to enabling individuals and organizations to establish trusting relationships based on respect for personal identity and information in the evolving networked world.

VeriSign® provides Intelligent Infrastructure Services that enable businesses and people around the world to find, connect, secure, and transact across today's complex Internet, telecommunications, and converged networks.

The following information describes our privacy policy in more detail.

How Secure Is Information About Me?

We work to protect the security of your information during transmission by using Secure Sockets Layer (SSL) software, which encrypts information you input. We also reveal only the last five digits of your credit card numbers when confirming an order.

How Secure Are My Transactions and Related Payment Information?

We work to protect the security of your transaction and payment information during transmission by using Public/Private Key encryption, which is virtually impossible to decipher.

What Personal Information About Customers Does Totebags.com Gather?

The information we learn from customers helps us personalize and continually improve your shopping experience at Totebags.com. Here are the types of information we gather.

Information You Give Us: We use this information for such purposes as responding to your requests, customizing future shopping for you, and improving our store.

Automatic Information: We receive and store information whenever you interact with us through the use of cookies. This allows us to provide you with a personalized experience, but ONLY after you have given us explicit permission to do so.

Does Totebags.com Share the Information It Receives?

Information about our customers is an important part of our business, and we are not in the business of selling it to others. Information is shared only with your explicit consent: Thus, you will receive notice when information about you might go to third parties, and you can choose not to share the information.

B.2.5.3 Better Surrogate for Affective Reactions

Consistent with several studies carried out in environmental psychology (e.g., Eroglu et al. 2003), the items of the dominance subdimension of PAD had to be dropped. While the resulting measure is parsimonious and easy to use, it does not fully capture the gamut of possible emotional reactions (Eroglu 1987; Machleit and Eroglu 2000). Consequently, it has been suggested that researchers should use a more comprehensive set of emotions (Eroglu et al 2001) or should use internal states that are "hypothesized to be relevant in their specific research context" (p. 181). Therefore, it was concluded that a new measure had be identified for the final study.

When reviewing the latest issue of MIS Quarterly released in December of 2004, one of the dissertation committee members came across an article written by Van der Heijden (2004) which proposed an extension of the technology acceptance model (TAM) (Davis 1989; Davis et al. 1989) to explain the acceptance of hedonic information systems. The author tests the proposition that what shapes intentions to use a website is dependent on whether the individual is using the web for utilitarian or hedonic purposes. Perceived usefulness was used to the subjects' perceptions that the web was of a utilitarian nature, while perceived enjoyment was used to capture the extent to which the web met hedonic purposes.

In this research endeavor, the features provided on a website have been categorized as being low or high task-relevant. The high task-relevant cues on the interface increase its utilitarian nature (Babin et al. 1994) by providing the features that are necessary in helping the

online user to achieve his or her goals. The online consumer evaluates these cues based on their usefulness in the attainment of the shopping goal. Therefore, the perceived usefulness of a particular website will depend on the presence of high task-relevant cues, such as the features associated with structural firmness and functional convenience.

In contrast, the low task-relevant cues increase the hedonic (Babin et al. 1994; Childers et al. 2001) and the experiential (Mathwick et al. 2001) value of the online experience. The online consumer evaluates these cues based on the amount of enjoyment, playfulness, and pleasure experienced. Therefore, the perceived enjoyment of a particular website will depend on the presence of low task-relevant cues, such as the features associated with representational delight.

Therefore, the low and high task-relevant cues increase both the utilitarian and hedonic nature of a website. Consequently, it was concluded that perceived usefulness and perceived enjoyment can be used in this research endeavor. This is in accordance to the recommendation by Eroglu and colleagues (Eroglu et al. 2001), where they indicated that researchers should use cognitive and reactive states that are relevant to their research context. Thus, perceived usefulness will be used as a surrogate for cognitive reactions and perceived enjoyment as a surrogate for affective reactions in the final study.

APPENDIX C

EXPERIMENTAL SIGNUP MATERIALS

C.1 Signup Information

MIS Research Study

The Department of Information Systems at Washington State University is engaged in a series of research projects that examine online consumer behavior. The principal investigators are D. Veena Parboteeah and John D. Wells. Your participation will take approximately 30 minutes. Upon completion of the study, you will receive 1 MIS250 research study credit PLUS 4 points of extra credit.

To sign up for a slot, please email D. Veena Parboteeah at veena@cbe.wsu.edu. Be sure to request AT LEAST 2-3 slots that work for you as some slots may fill up (Note: Your participation will involve only one 20-minute slot). Once you are assigned a slot, you will receive an email confirmation.

Place: Todd 203

Available Dates/Times:
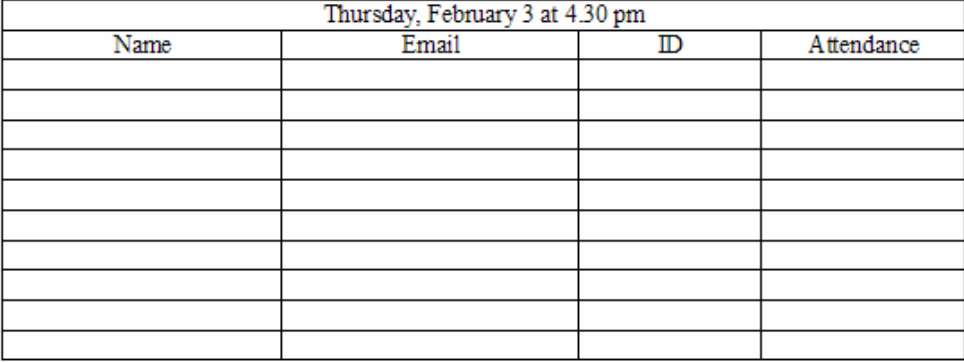
Monday (1/31), (2/7), (2/14), (2/21), (2/28) 6:00 pm 6:30 pm 7:00 pm 7:30 pm	Tuesday (2/1), (2/8), (2/15), (2/22), (3/1) 7:00 pm 7:30 pm
Thursday (2/3), (2/10), (2/17), (2/24) 4:30 pm 5:00 pm 5:30 pm 6:00 pm	Friday (2/25) 3:00 pm 3:30 pm 4:00 pm 4:30 pm
Sunday (2/27) 2:00 pm 2:30 pm 3:00 pm 3:30 pm 4.00 pm 4:30 pm 5:00 pm 5:30 pm 6:00 pm	

Thank you in advance for your time and consideration. If you have any questions or concerns about your potential participation in this research study, please contact Veena Parboteeah (veena@cbe.wsu.edu) or John Wells (wells@cbe.wsu.edu).

C.2 Confirmation Electronic Mail

Using Microsoft Excel, separate worksheets were created for each of the available days. Additionally, within each worksheet, different tables were created for each of the time slots available for that particular day. Four columns were created within each table and these were labeled Name, Email, ID, and Attendance. Figure C.1 depicts one of the tables created for the 4:30 pm slot on Thursday, February 3, 2005.

Figure C.1: Screenshot of a Created Table

Thursday, February 3 at 4.30 pm			
Name	Email	ID	Attendance

Once an email was received from a student, depending on the availability of open spots within the different time slots and his or her preferences, he or she was assigned to a research session. The table created for that particular day and time selected was updated with information about the student. The Name column was updated with the name of the student and the ID column with the student's identification number. These two pieces of information were at a later stage given to the faculty member, so that the students who volunteered for the study will receive extra credit for the class. The Email column was updated with the email address of the student, which will be used to send the confirmation and reminder emails. At this stage, the Attendance column was left blank. Figure C.2 shows one of the updated tables.

Figure C.2: Screenshot of an Updated Table

Thursday, February 3 at 4.30 pm			
Name	Email	ID	Attendance
Jane Doe	jdoe@wsu.edu	12345678	

The student was sent a confirmation email with the assigned date and time. An example of a confirmation email is provided in Figure C.3.

Figure C.3: Screenshot of Confirmation Email
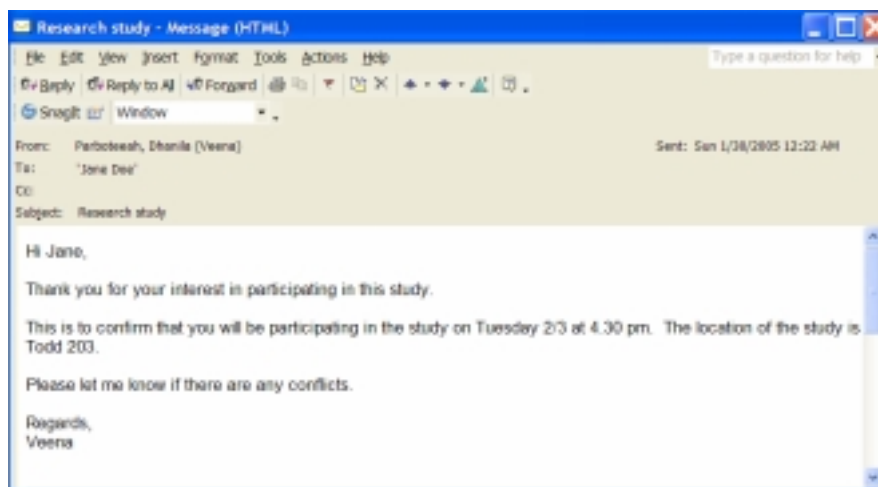
C.3 Reminder Electronic Mail

One day before the study, the student was sent a reminder email with information about the time at which he or she was participating in the study as well as the location of the study (see Figure C.4). The student was also notified that he or she had to bring a pen or a pencil.

Figure C.4: Screenshot of Reminder Email
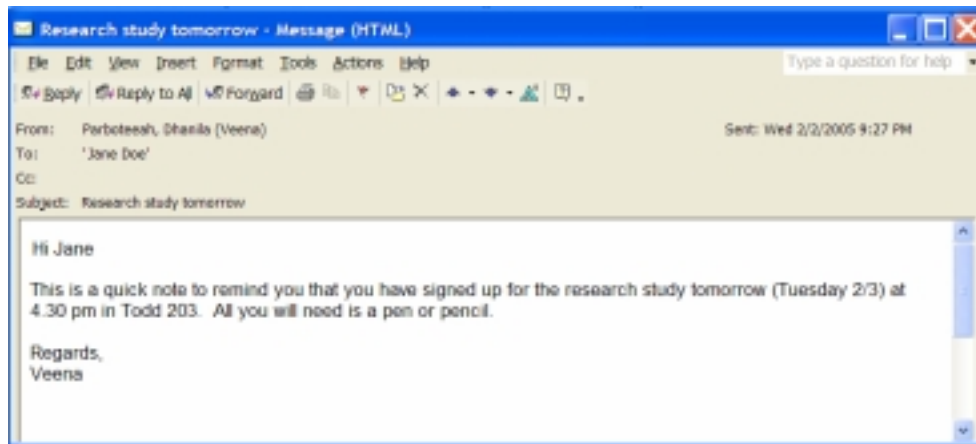
C.4 Number of Sessions

Since download delay was manipulated in the different experimental interfaces, two of these interfaces were characterized by slow response times. A pretest indicated that only seven to eight subjects can work on these interfaces at the same time. A bigger sample will bog down the server, which would cause multiple errors when interacting with the websites. For that reason, for two of the treatment groups, only 6-7 subjects participated at one time in the research session, while for the other treatment groups, there was no restriction. Consequently, for interfaces v1 and v2, the number of people in a research session ranged from 2-3, while for interfaces v3 and v4, the number ranged from 3-17. Thirty-eight sessions were scheduled over a five-week period. Table C.1 depicts the days and time the different sessions were scheduled and the number of subjects who attended those sessions. Note that all the sessions were in 2005.

Table C.1: Schedule of Different Research Sessions

Day	Time	Interface	Number of Subjects
January 31	7:00 pm	v1	5
February 1	7:00 pm	v4	17
February 3	4:30 pm	v3	17
	5:00 pm	v2	5
	5:30 pm	v1	5
	6:00 pm	v2	3
February 7	6:00 pm	v3	15
	6:30 pm	v1	5
	7:00 pm	v2	6
	7:30 pm	v1	5
February 8	7:00 pm	v2	8
	7:30 pm	v1	5
February 10	4:30 pm	v1	7
	5:00 pm	v2	6
	5:30 pm	v1	5
February 14	6:00 pm	v2	5
	6:30 pm	v2	2
	7:00 pm	v2	2
February 15	7:00 pm	v1	7
	7:30 pm	v2	7
February 17	4:30 pm	v4	6
	5:00 pm	v3	6
	5:30 pm	v4	5
	6:00 pm	v3	5
February 21	6:00 pm	v1	5
February 22	7:00 pm	v2	2
February 24	4:30 pm	v1	5
	5:00 pm	v2	2
	5:30 pm	v2	2
February 25	3:00 pm	v2	3
	4:00 pm	v2	2
February 27	2:00 pm	v4	6
	3:00 pm	v4	6
	5:00 pm	v3	3
February 28	6:00 pm	v4	6
	6:30 pm	v3	5
March 1	7:00 pm	v4	9
	7:30 pm	v3	6

APPENDIX D

SCREENSHOT OF INTERFACES

APPENDIX D

SCREENSHOTS OF INTERFACES

This appendix provides the screen shots of different pages of the four different websites used in the experiment. In the first section, the availability or unavailability of the different cues was explained with reference to the screenshots depicted in this appendix. The next section includes screen shots from the different interfaces provided in a table format to allow easy comparison across the different interfaces at a quick glance. The last four sections consist of several screen shots for each of the four interfaces created.

D.1 The Different Interfaces

Interface v1 contained neither the low nor the high task-relevant cues. The absence of the low task-relevant cues can be evidenced by the bright blue background of the homepage (see Figure D.1) as well as the subsequent web pages (see Figures D.2 to D.6). The absence of structural firmness is evident from the slow response time (see Figure D.2), the security and privacy policy (see Figure D.3), and the unavailabil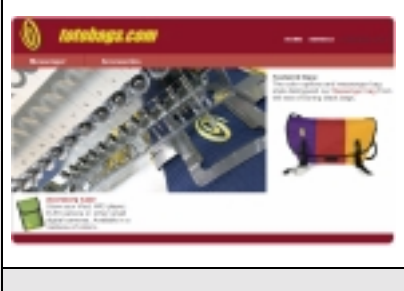ity of security seals at checkout (see Figure D.6). The lack of features related to functional convenience can be shown by how difficult it was to view a product (see Figure D.4) and to purchase the product (see Figure D.5).

The second interface, v2, contained only the low task-relevant cues. The presence of the low task-relevant cues can be evidenced by the nice background of the homepage (see Figure D.7) as well as the subsequent web pages (see Figures D.7 to D.12). The absence of structural firmness is evident from the slow response time (see Figure D.8), the security and privacy policy (see Figure D.9), and the unavailability of security seals at checkout (see Figure D.12). The lack
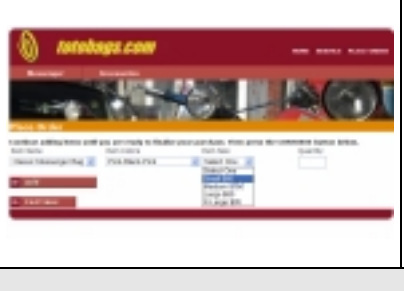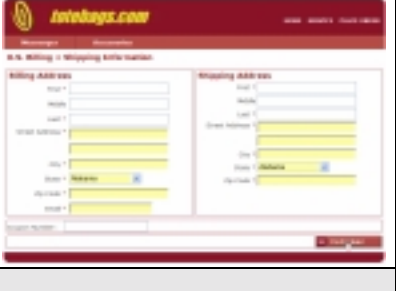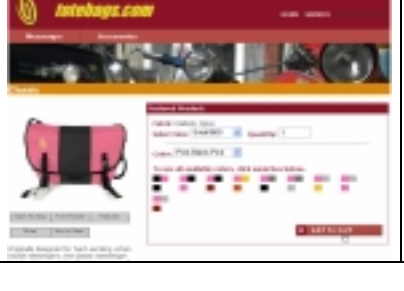
of features related to functional convenience can be shown by how difficult it was to view a product (see Figure D.10) and to purchase the product (see Figure D.11).

The third interface, v3, consisted of only the high task-relevant cues. The absence of the low task-relevant cues can be evidenced by the bright blue background of the homepage (see Figure D.13) as well as the subsequent web pages (see Figures D.14 to D.17). The presence of structural firmness is evident from the security and privacy policy (see Figure D.14) and the availability of security seals at checkout (see Figure D.17). The presence of features related to functional convenience can be shown by how easy it was to view a product (see Figure D.15) and to purchase the product (see Figure D.16).

The last interface, v4, included both the low and high task-relevant cues. The presence of the low task-relevant cues can be evidenced by the nice background of the homepage (see Figure D.18) as well as the subsequent web pages (see Figures D.19 to D.22). The presence of structural firmness is evident from the security and privacy policy (see Figure D.19) and the availability of security seals at checkout (see Figure D.22). The presence of features related to functional convenience can be shown by how easy it was to view a product (see Figure D.20) and to purchase the product (see Figure D.21).

D.2 Comparison of the Four Interfaces

Table D.1: Comparing the Different Interfaces

	RD	FC	SF
v1			
v2			
v3			
v4			

D.3 Interface v1

Figure D.1: Homepage of Interface v1

Figure D.2: Download Delay in Interface v1

Figure D.3: Security and Privacy Policy on Interface v1
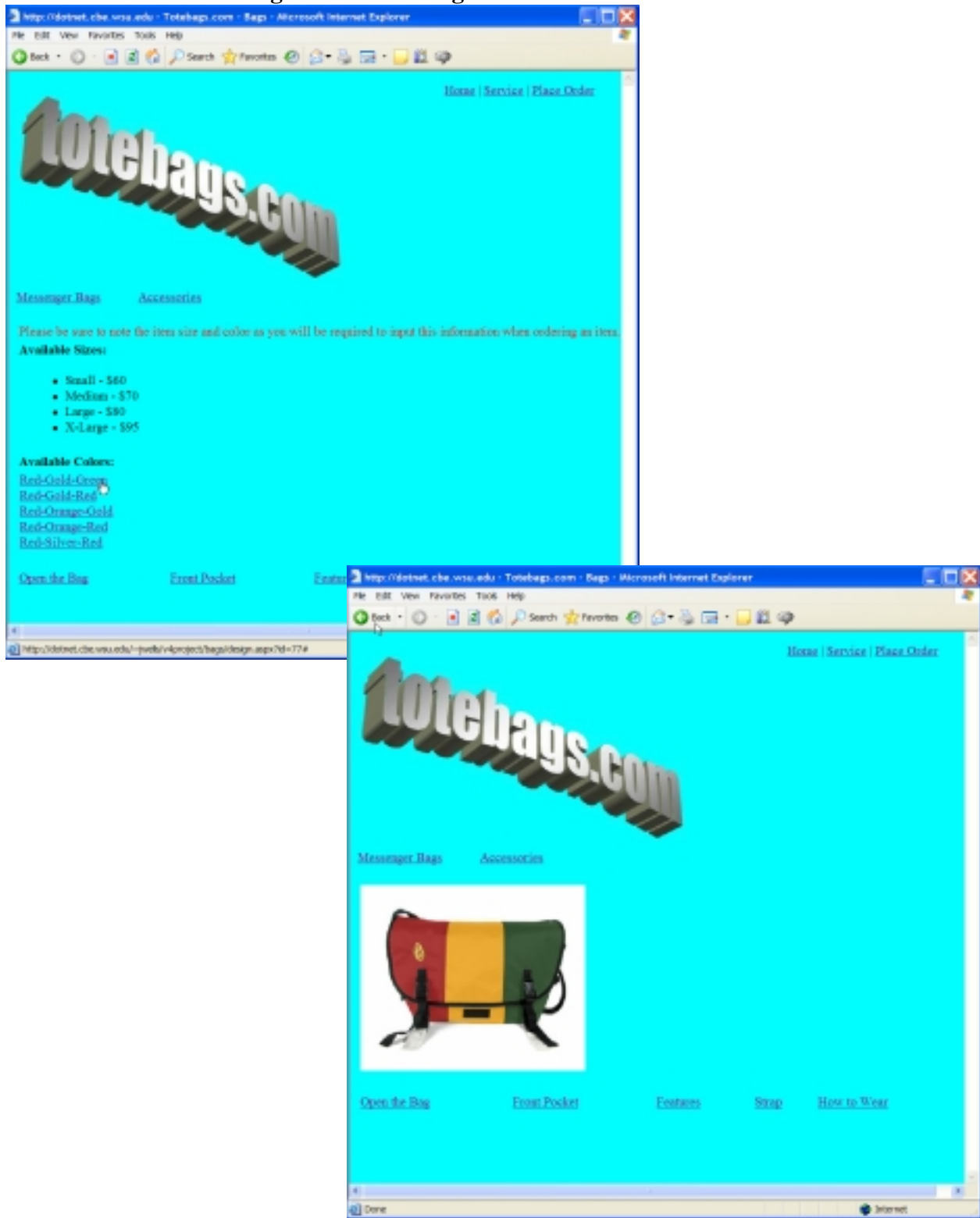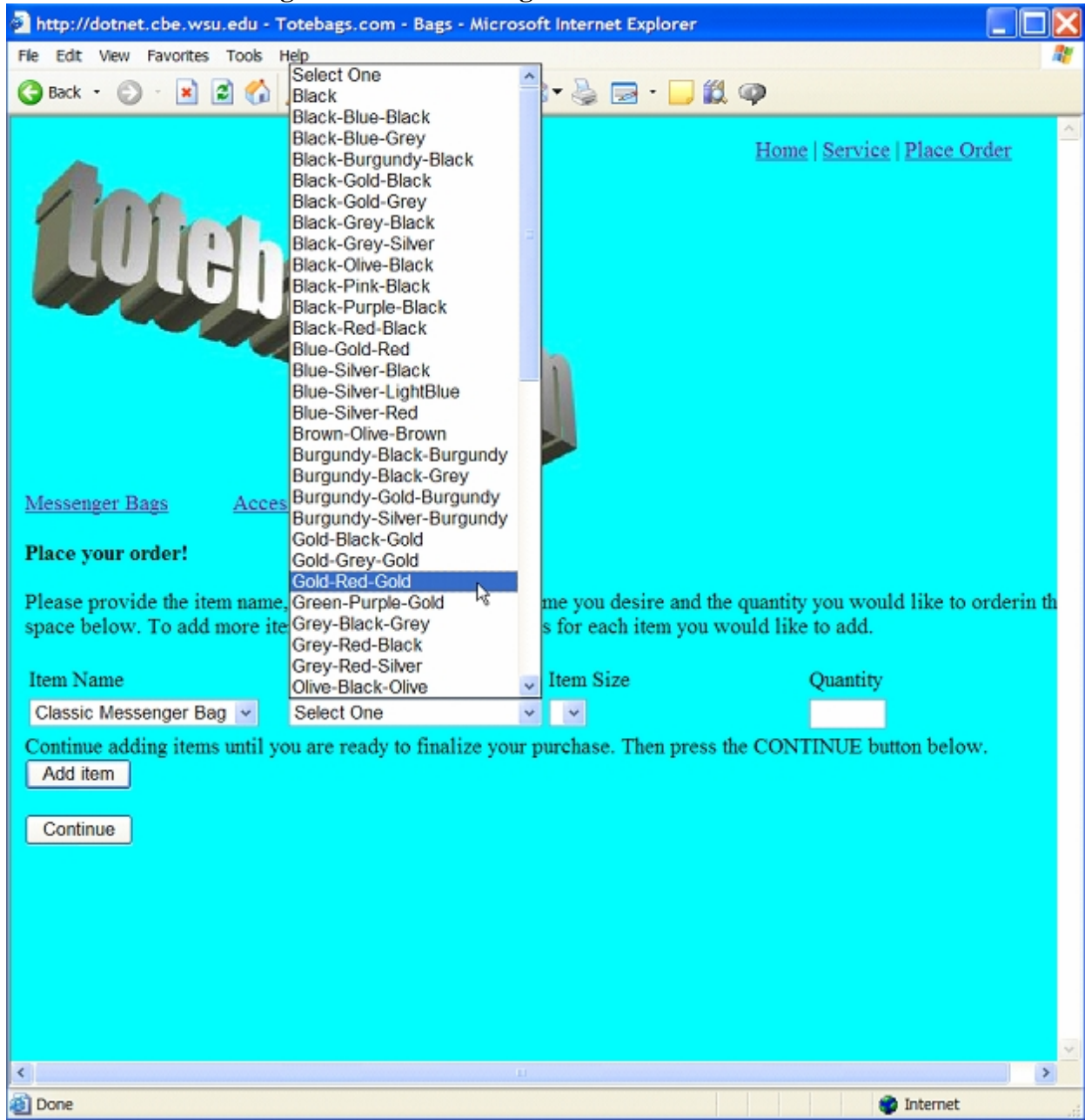
Browser window: http://dotnet.cbe.wsu.edu - Totebags.com - Bags - Microsoft Internet Explorer

How Secure Is Information About Me (Payment/Transaction Information)?

We attempt to take reasonable precautions to protect your privacy and to secure your sensitive information (e.g., credit card number). However, given the widespread fraud and identity theft that is occurring via the Internet, Totebags.com cannot guarantee that your private and sensitive information is 100% secure and does not assume responsibility should such information become compromised.

What Personal Information About Customers Does Totebags.com Gather?

The information we learn from customers helps us personalize and continually improve your shopping experience at Totebags.com. Here are the types of information we gather:

Information You Give Us: We use this information for such purposes as responding to your requests and customizing future shopping for you. For your order to be processed, it is essential that you provide ALL the requested information.

Automatic Information: We receive and store information whenever you interact with us through the use of cookies.

Information from Other Sources: We might receive information about you from other sources and add it to our account information.

Does Totebags.com Share the Information It Receives?

Information about our customers is an important part of our business. Totebags.com considers customer information to be an organizational asset. Thus, we reserve the right to sell information to various third parties and to use customer information as a means of revenue generation. Here are some ways we share information collected about you:

Agents: We employ other companies to perform functions on our behalf. They have access to your personal information and may use such information for other purposes (e.g., market analysis).

Promotional Offers: Sometimes we send offers to Totebags.com customers on behalf of
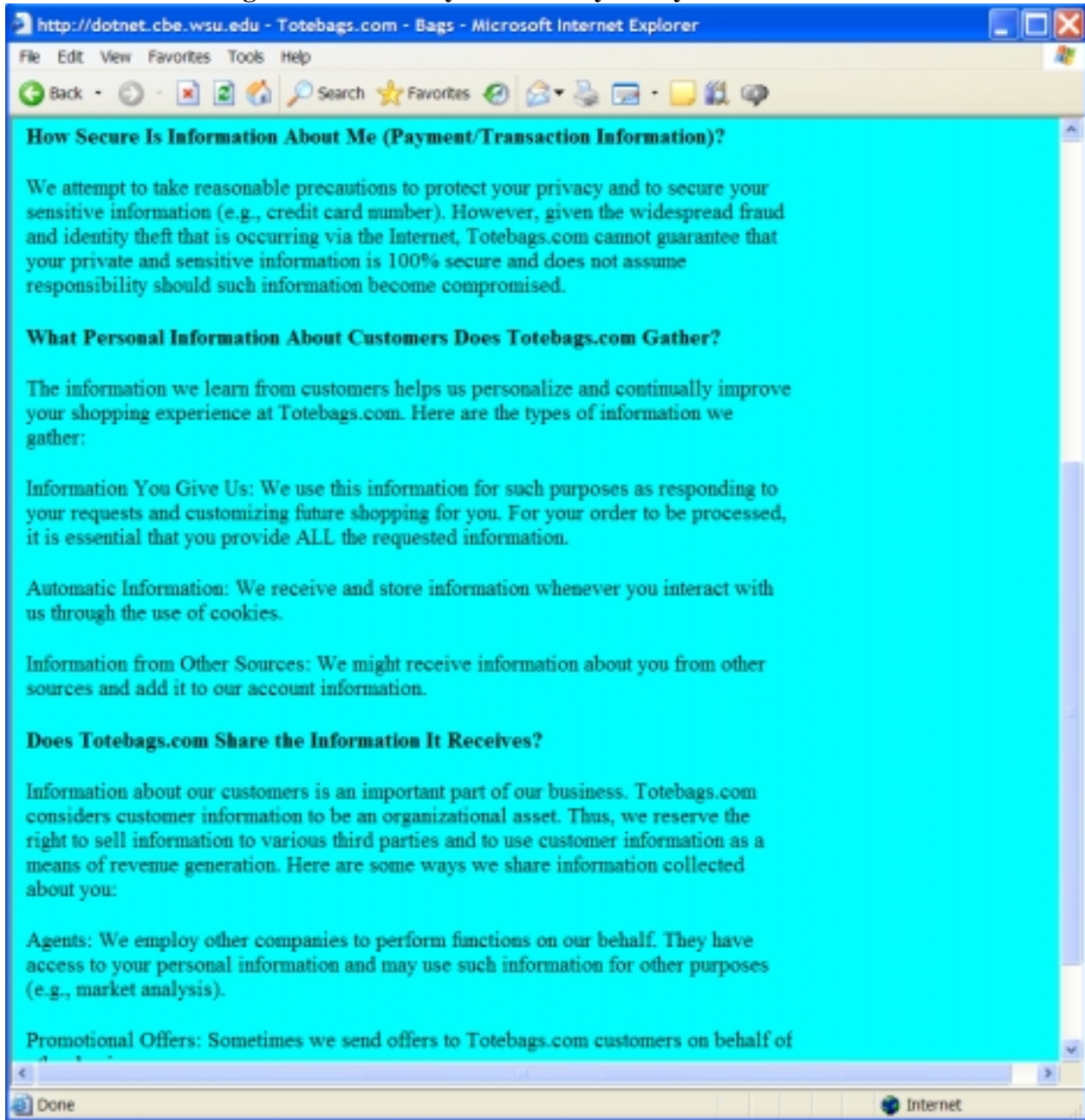
285

Figure D.4: Viewing a Product at Interface v1

Figure D.5: Purchasing a Product at Interface v1

Figure D.6: Missing Security Seals on Interface v1

D.4 Interface v2

Figure D.7: Homepage of Interface v2

Figure D.8: Download Delay in Interface v2
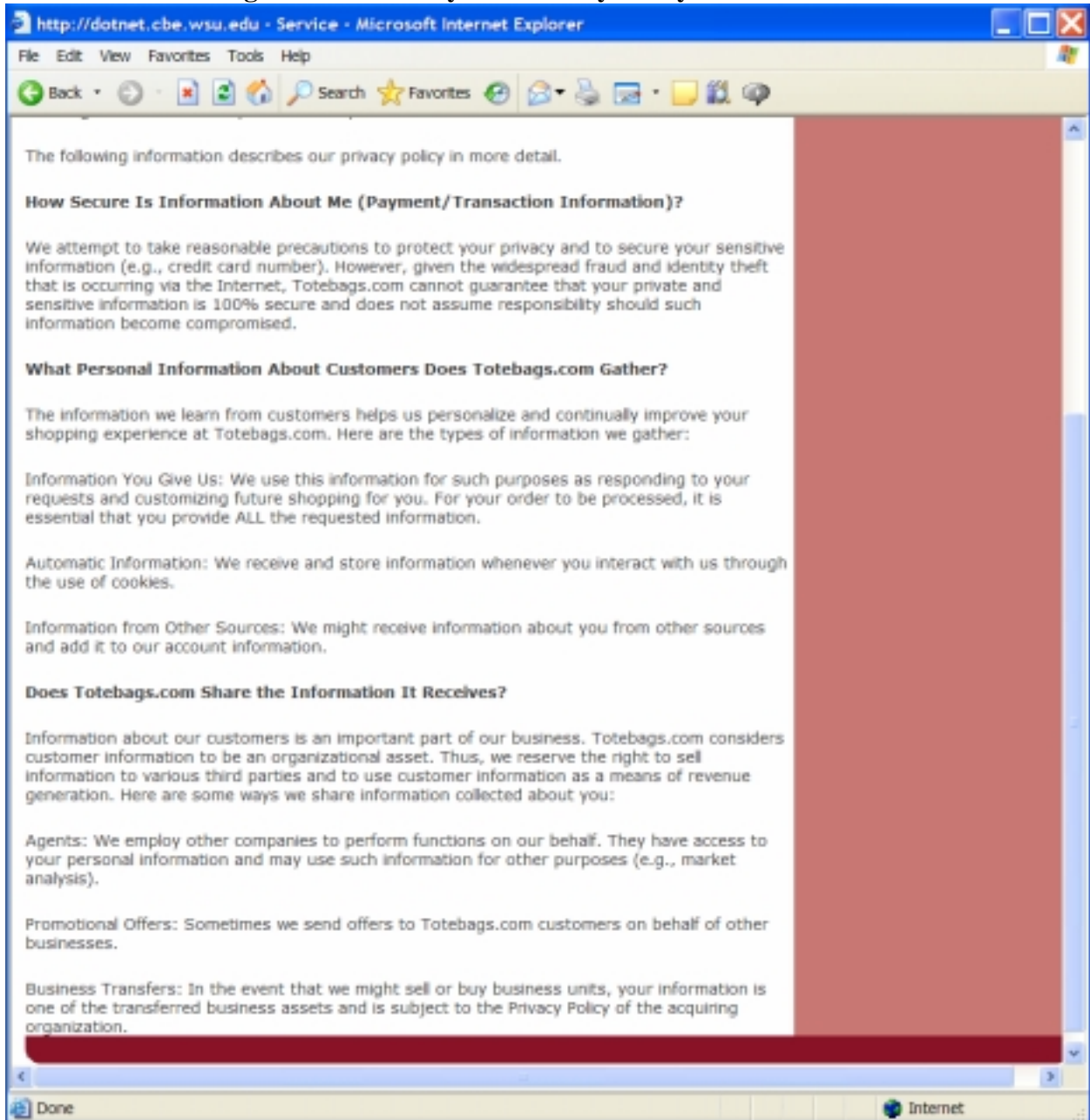
Figure D.9: Security and Privacy Policy on Interface v2

The following information describes our privacy policy in more detail.

How Secure Is Information About Me (Payment/Transaction Information)?

We attempt to take reasonable precautions to protect your privacy and to secure your sensitive information (e.g., credit card number). However, given the widespread fraud and identity theft that is occurring via the Internet, Totebags.com cannot guarantee that your private and sensitive information is 100% secure and does not assume responsibility should such information become compromised.

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Information from Other Sources: We might receive information about you from other sources and add it to our account information.

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Promotional Offers: Sometimes we send offers to Totebags.com customers on behalf of other businesses.

Business Transfers: In the event that we might sell or buy business units, your information is one of the transferred business assets and is subject to the Privacy Policy of the acquiring organization.

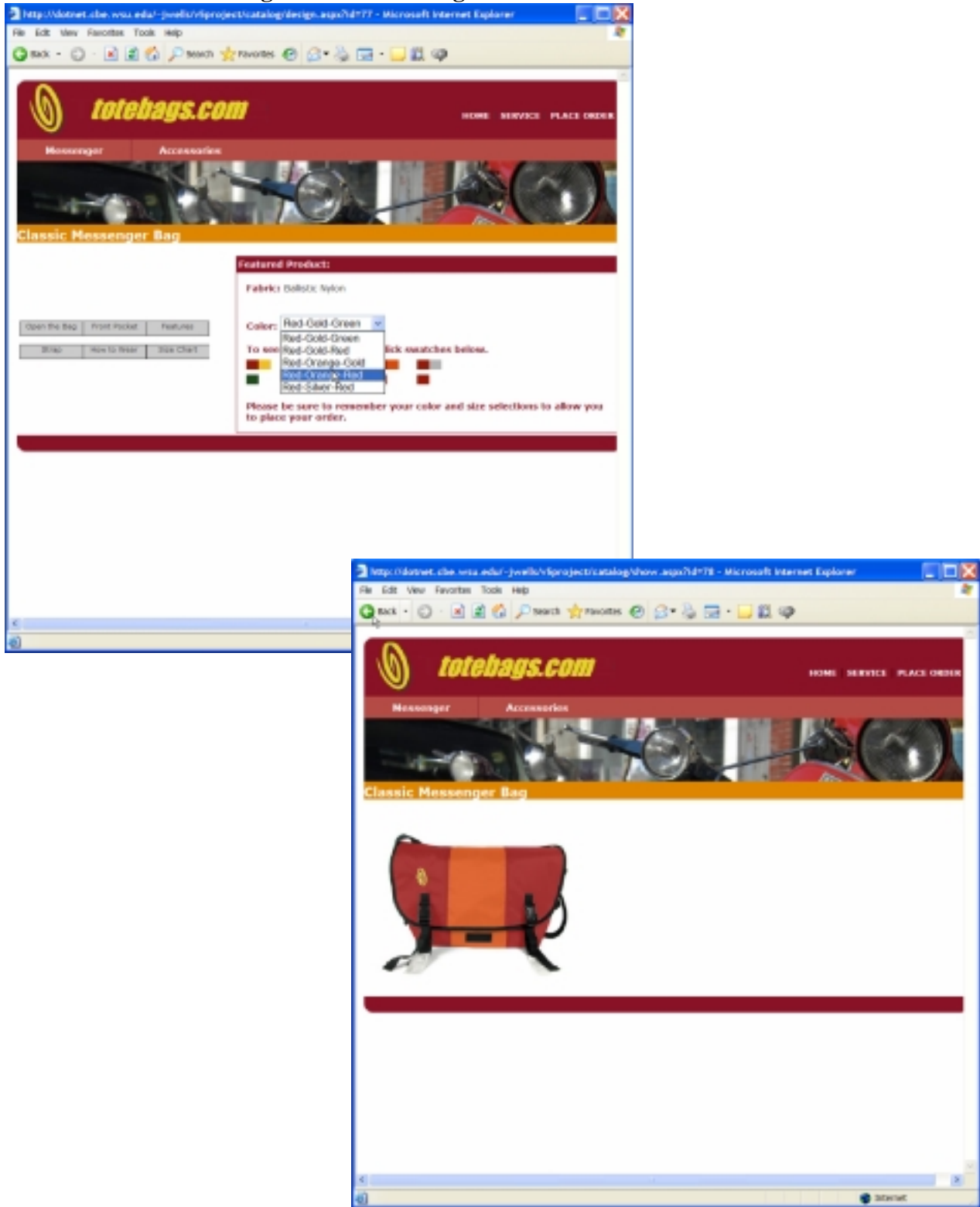**Figure D.10: Viewing a Product at Interface v2**

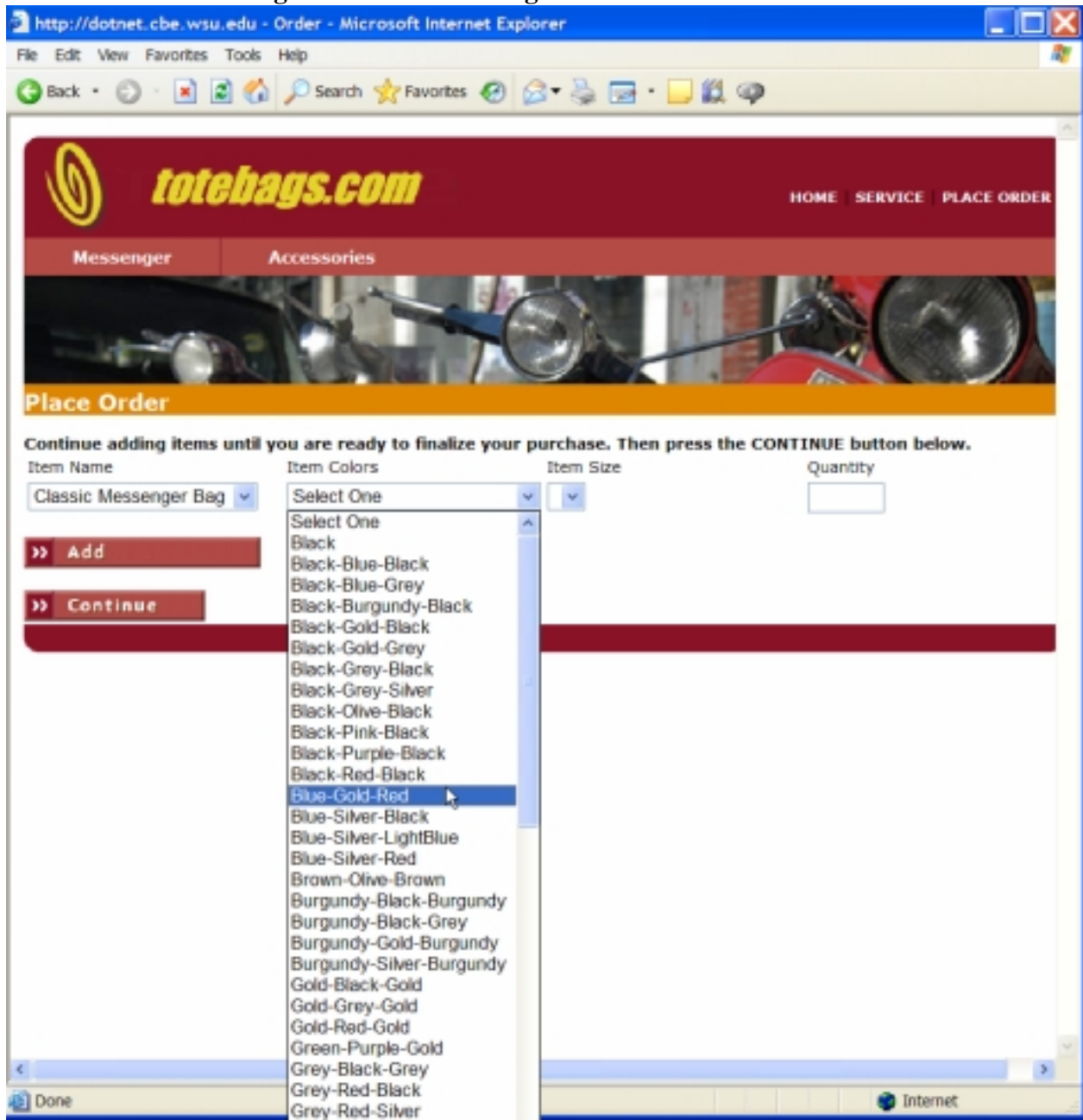**Figure D.11: Purchasing a Product at Interface v2**

Figure D.12: Missing Security Seals on Interface v2
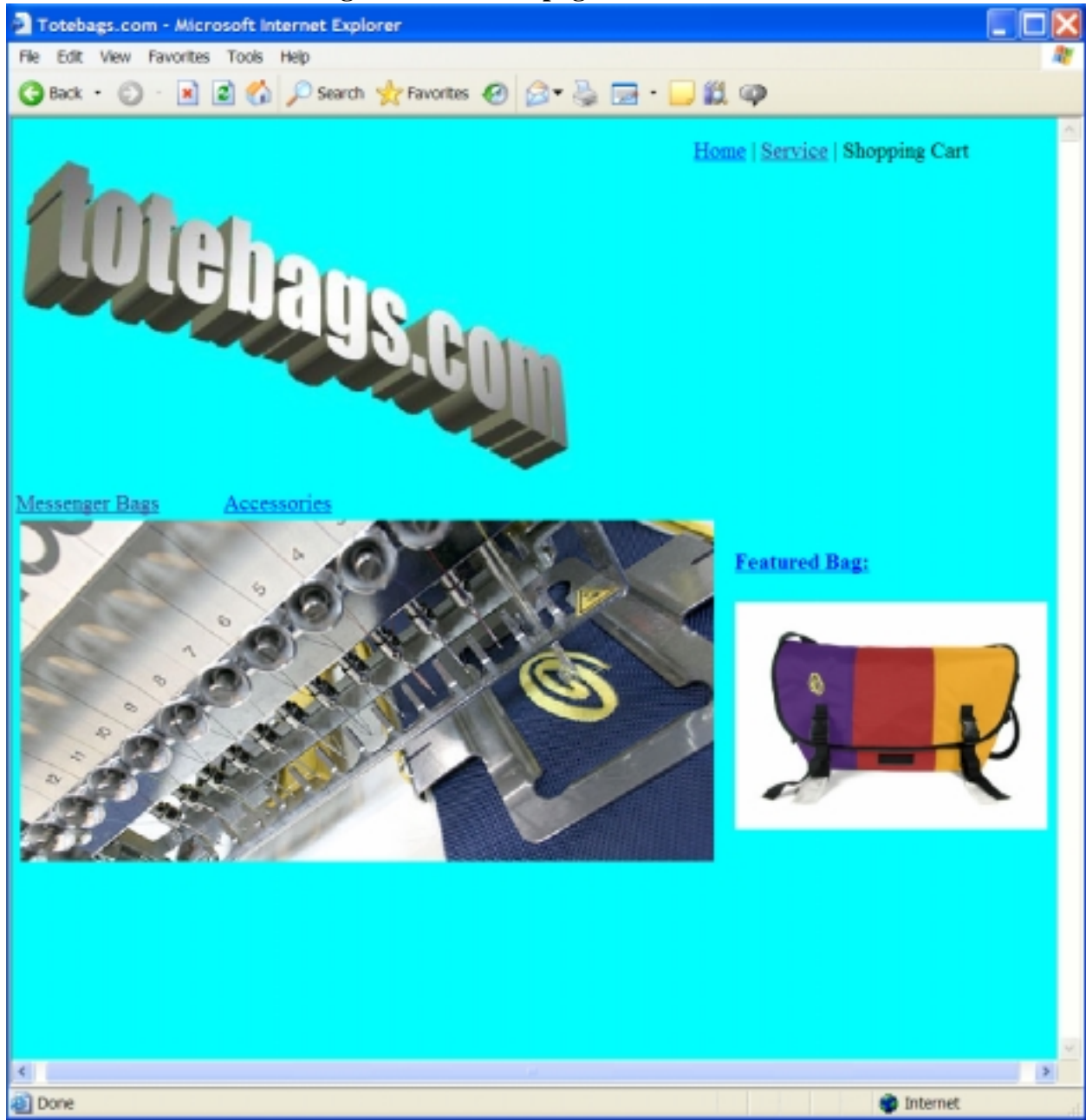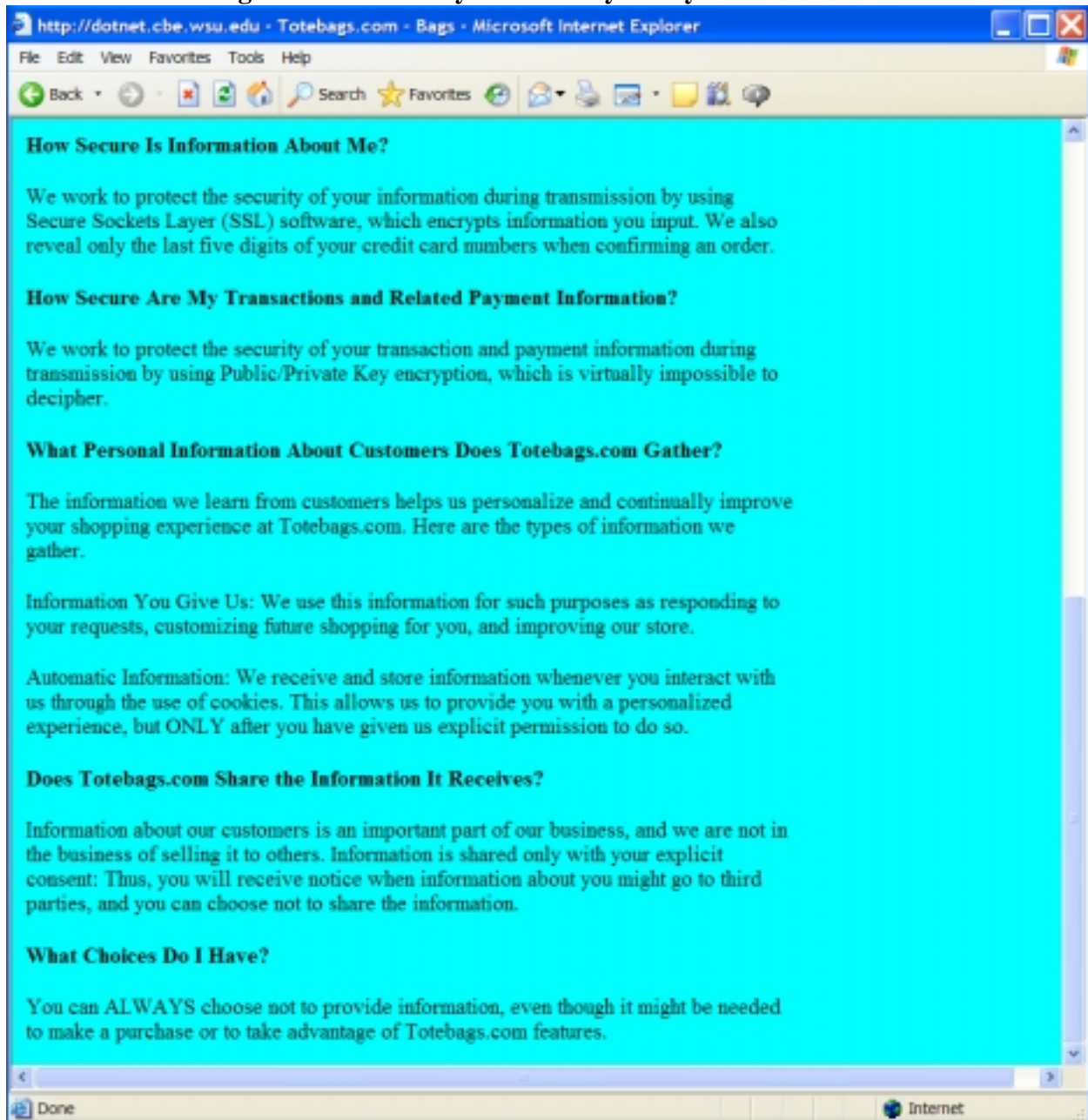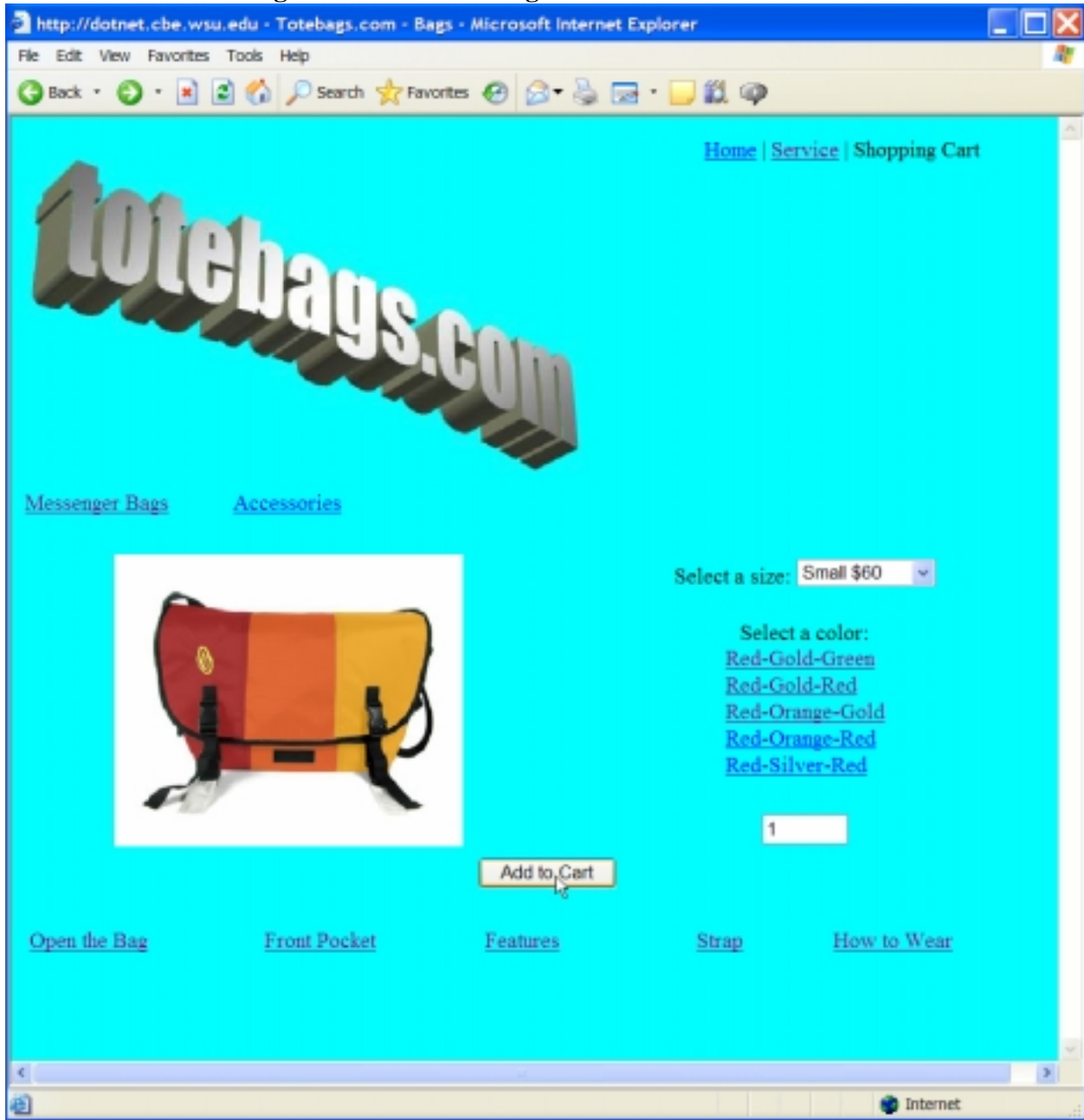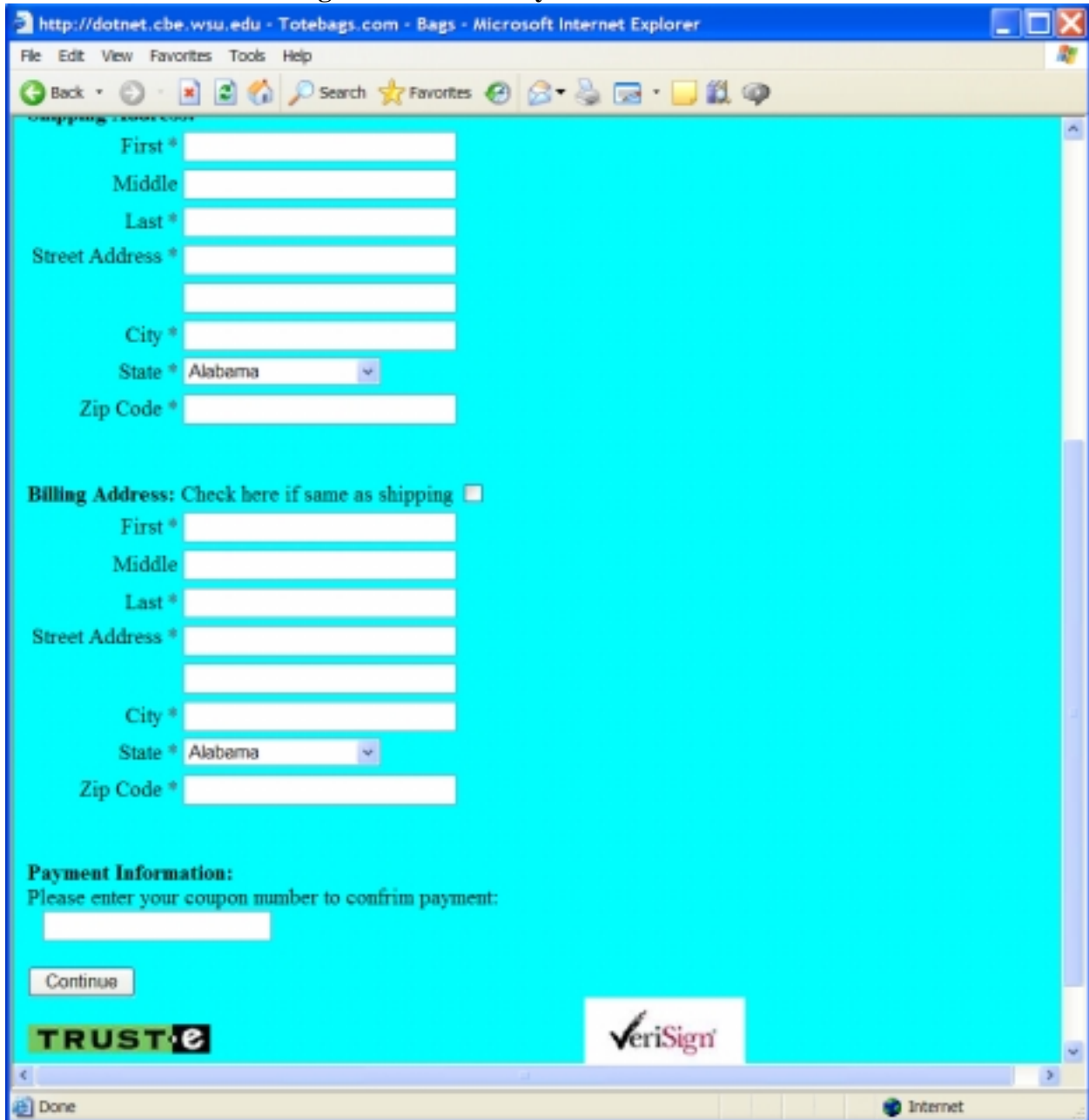
D.5 Interface v3

Figure D.13: Homepage of Interface v3

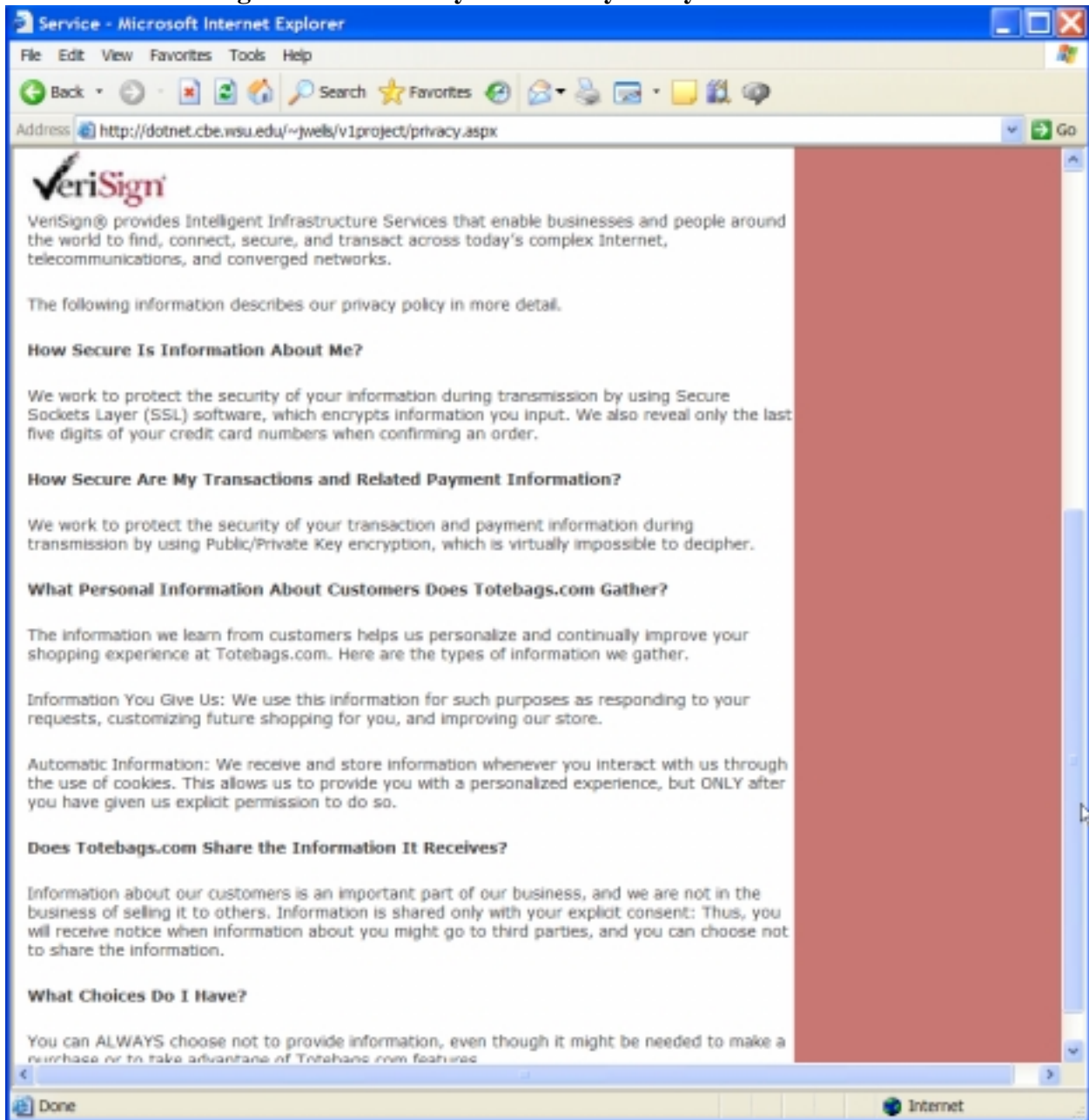**Figure D.14: Security and Privacy Policy on Interface v3**

How Secure Is Information About Me?

We work to protect the security of your information during transmission by using Secure Sockets Layer (SSL) software, which encrypts information you input. We also reveal only the last five digits of your credit card numbers when confirming an order.

How Secure Are My Transactions and Related Payment Information?

We work to protect the security of your transaction and payment information during transmission by using Public/Private Key encryption, which is virtually impossible to decipher.

What Personal Information About Customers Does Totebags.com Gather?

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Does Totebags.com Share the Information It Receives?

Information about our customers is an important part of our business, and we are not in the business of selling it to others. Information is shared only with your explicit consent: Thus, you will receive notice when information about you might go to third parties, and you can choose not to share the information.

What Choices Do I Have?

You can ALWAYS choose not to provide information, even though it might be needed to make a purchase or to take advantage of Totebags.com features.

Figure D.15: Viewing a Product at Interface v3

Figure D.16: Purchasing a Product at Interface v3

Figure D.17: Security Seals on Interface v3

D.6 Interface v4

Figure D.18: Homepage of Interface v4

Figure D.19: Security and Privacy Policy on Interface v4

VeriSign®

VeriSign® provides Intelligent Infrastructure Services that enable businesses and people around the world to find, connect, secure, and transact across today's complex Internet, telecommunications, and converged networks.

The following information describes our privacy policy in more detail.

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We work to protect the security of your information during transmission by using Secure Sockets Layer (SSL) software, which encrypts information you input. We also reveal only the last five digits of your credit card numbers when confirming an order.

How Secure Are My Transactions and Related Payment Information?

We work to protect the security of your transaction and payment information during transmission by using Public/Private Key encryption, which is virtually impossible to decipher.

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Does Totebags.com Share the Information It Receives?

Information about our customers is an important part of our business, and we are not in the business of selling it to others. Information is shared only with your explicit consent: Thus, you will receive notice when information about you might go to third parties, and you can choose not to share the information.

What Choices Do I Have?

You can ALWAYS choose not to provide information, even though it might be needed to make a purchase or to take advantage of Totebags.com features.

Figure D.20: Viewing a Product at Interface v4

Figure D.21: Purchasing a Product at Interface v4
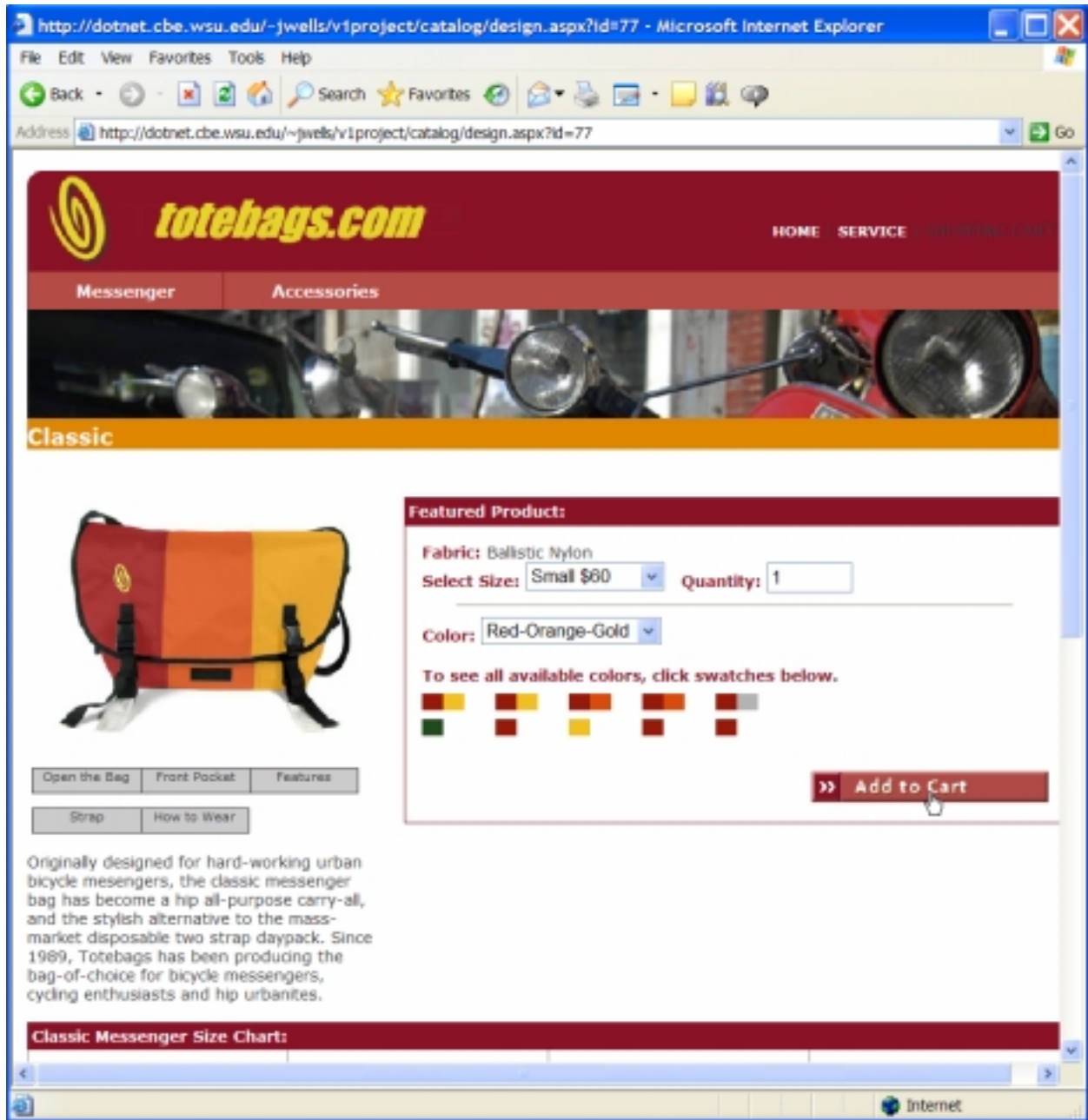
Figure D.22: Security Seals on Interface v4

APPENDIX E

EXPERIMENTAL TASK SHEETS

E.1 Experimental Task Sheet for Interface v1

Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v1project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Preview the bag in different colors. Read the information provided on the product.	
7	You will now select an iPod case. Click on **Accessories** on the top menu.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

E.2 Experimental Task Sheet for Interface v2

Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v2project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Click on a bag of your choice. Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
7	You will now select an iPod case.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors. Then, close the **Accessories** window.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

E.3 Experimental Task Sheet for Interface v3

Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v3project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Continue**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

E.4 Experimental Task Sheet for Interface v4

Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v4project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Checkout**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

APPENDIX F

EXPERIMENTAL MATERIALS

F.1 Experimental Material for Interface v1

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Bob is a 21-year-old college student with a part-time job. He owns an older tote bag that is a little worn and isn't exactly the latest style. He has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that he can use along with the bag. Bob plans to spend no more than $20 for the purchase of this new accessory, but he feels that he has enough extra money to splurge a little if he finds something he really likes. After work, he decides to browse the Internet to purchase the holster. As he was browsing the website, Bob sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, he wouldn't mind finding something that would conveniently store his MP3/iPod device.

When considering which website to buy from, Bob is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Bob in determining whether he should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v1project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Preview the bag in different colors. Read the information provided on the product.	
7	You will now select an iPod case. Click on **Accessories** on the top menu.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Mary is a 21-year-old college student with a part-time job. She owns an older tote bag that is a little worn and isn't exactly the latest style. She has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that she can use along with the bag. Mary plans to spend no more than $20 for the purchase of this new accessory, but she feels that she has enough extra money to splurge a little if she finds something she really likes. After work, she decides to browse the Internet to purchase the holster. As she was browsing the website, Mary sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, she wouldn't mind finding something that would conveniently store her MP3/iPod device.

When considering which website to buy from, Mary is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Mary in determining whether she should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v1project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Preview the bag in different colors. Read the information provided on the product.	
7	You will now select an iPod case. Click on **Accessories** on the top menu.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

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F.2 Experimental Material for Interface v2

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Bob is a 21-year-old college student with a part-time job. He owns an older tote bag that is a little worn and isn't exactly the latest style. He has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that he can use along with the bag. Bob plans to spend no more than $20 for the purchase of this new accessory, but he feels that he has enough extra money to splurge a little if he finds something he really likes. After work, he decides to browse the Internet to purchase the holster. As he was browsing the website, Bob sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, he wouldn't mind finding something that would conveniently store his MP3/iPod device.

When considering which website to buy from, Bob is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Bob in determining whether he should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v2project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Click on a bag of your choice. Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
7	You will now select an iPod case.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors. Then, close the **Accessories** window.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

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Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Mary is a 21-year-old college student with a part-time job. She owns an older tote bag that is a little worn and isn't exactly the latest style. She has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that she can use along with the bag. Mary plans to spend no more than $20 for the purchase of this new accessory, but she feels that she has enough extra money to splurge a little if she finds something she really likes. After work, she decides to browse the Internet to purchase the holster. As she was browsing the website, Mary sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, she wouldn't mind finding something that would conveniently store her MP3/iPod device.

When considering which website to buy from, Mary is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Mary in determining whether she should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v2project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	You will now look at available bags. Click on **Messenger** on the top menu.	
6	Click on a bag of your choice. Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
7	You will now select an iPod case.	
8	Click on the **iPod Case**.	
9	Preview the iPod case in different colors. Then, close the **Accessories** window.	
10	Next, review the customer service information provided on the website. Click on **Service** at the top of the page.	
11	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
12	You are now ready to place an order. Click on the **Place Order** link at the top of the page and select a bag of your choice	
13	After you have selected a tote bag, select AT LEAST TWO accessories and add them to your order.	
14	After you have added your items, click the **Continue** button and initiate the checkout process.	
15	Enter your billing address and shipping address. Click **Continue**.	
16	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
17	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

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F.3 Experimental Material for Interface v3

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Bob is a 21-year-old college student with a part-time job. He owns an older tote bag that is a little worn and isn't exactly the latest style. He has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that he can use along with the bag. Bob plans to spend no more than $20 for the purchase of this new accessory, but he feels that he has enough extra money to splurge a little if he finds something he really likes. After work, he decides to browse the Internet to purchase the holster. As he was browsing the website, Bob sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, he wouldn't mind finding something that would conveniently store his MP3/iPod device.

When considering which website to buy from, Bob is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Bob in determining whether he should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v3project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Continue**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Mary is a 21-year-old college student with a part-time job. She owns an older tote bag that is a little worn and isn't exactly the latest style. She has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that she can use along with the bag.   Mary plans to spend no more than $20 for the purchase of this new accessory, but she feels that she has enough extra money to splurge a little if she finds something she really likes. After work, she decides to browse the Internet to purchase the holster. As she was browsing the website, Mary sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, she wouldn't mind finding something that would conveniently store her MP3/iPod device.

When considering which website to buy from, Mary is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Mary in determining whether she should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v3project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Continue**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

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F.4 Experimental Material for Interface v4

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Bob is a 21-year-old college student with a part-time job. He owns an older tote bag that is a little worn and isn't exactly the latest style. He has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that he can use along with the bag. Bob plans to spend no more than $20 for the purchase of this new accessory, but he feels that he has enough extra money to splurge a little if he finds something he really likes. After work, he decides to browse the Internet to purchase the holster. As he was browsing the website, Bob sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, he wouldn't mind finding something that would conveniently store his MP3/iPod device.

When considering which website to buy from, Bob is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Bob in determining whether he should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v4project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Checkout**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

Student ID: _____

STEP 1: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/pretest.htm

STEP 2: Please read the following scenario before performing the tasks listed below.

Mary is a 21-year-old college student with a part-time job. She owns an older tote bag that is a little worn and isn't exactly the latest style. She has recently bought a new cell-phone and is considering the purchase of a cell-phone holster that she can use along with the bag. Mary plans to spend no more than $20 for the purchase of this new accessory, but she feels that she has enough extra money to splurge a little if she finds something she really likes. After work, she decides to browse the Internet to purchase the holster. As she was browsing the website, Mary sees a great-looking bag which is on sale for $60 and falls in love with it on first sight. Also, she wouldn't mind finding something that would conveniently store her MP3/iPod device.

When considering which website to buy from, Mary is mostly concerned about the security associated with it, the features that are provided to help with order processing, and the interface presentation. Please help Mary in determining whether she should make the purchase at this website. Below is a list of items that will help you in assessing the website. Please perform and check off each action as you go through the list.

		Check
1	Go to http://dotnet.cbe.wsu.edu/~jwells/v4project/.	
2	Click on **Accessories** on the top menu.	
3	Click on the **Cell Phone Holster**.	
4	Preview the cell phone holster in different colors.	
5	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
6	You will now look at available bags. Click on **Messenger** on the top menu.	
7	Click on a bag of your choice.	
8	Read the information provided on the product. Also feel free to go back and forth to experiment with different colors.	
9	Pick a color that you like and click on **Add to Cart**.	
10	You will now select an iPod case. Click on **Accessories** on the top menu.	
11	Click on the **iPod Case**.	
12	Preview the iPod case in different colors.	
13	Pick a color that you like and add it to your cart. Close the **Accessories** window.	
14	Before checking out, you want to review the customer service information provided on the website. Click on **Service** at the top of the page.	
15	Now, click on **Security & Privacy** and read the provided information. Click the 'BACK' button to return to the previous screen.	
16	You are now ready to checkout. Click on **Shopping Cart** on the top menu	
17	Click **Checkout**.	
18	Enter your billing address and shipping address. Click **Continue**.	
19	Enter your Student ID number (e.g. 12345678) as the **Coupon Number** and click **Continue**.	
20	At this point, you can close the window.	

STEP 3: Go to the following webpage and complete the survey:

http://www.cbe.wsu.edu/~vparboteeah/survey.htm

APPENDIX G

EXPERIMENTAL SCRIPT

1. Assign students to the different sessions.
2. Test online questionnaire to determine whether responses were being saved in database.
3. Make copies of the experimental material.
4. Print out tables created when assigning students to different research sessions (see Appendix C).
5. Determine which experimental groups will be conducted in the different sessions on the particular day, based on the number of subjects in the different cells so far.

Session Procedures

1. As subjects entered the computer laboratory, check their names off on created table (see Figure G.1).
2. Make sure that subjects are dispersed across the room.
3. Tell subjects to log into the workstation.
4. Wait for a few minutes after scheduled session time to wait for any late arrivers.

Figure G.1: Updated Table

Thursday, February 3 at 4.30 pm			
Name	Email	ID	Attendance
Jane Doe	jdoe@wsu.edu	12345678	√

Introduction Script

Hello, everyone. My name is Veena Parboteeah and I am a Ph.D. student in the Department of Information Systems here at Washington State University. First of all, I would like to thank you for coming in today. I appreciate your participation in this study.

Before we start the study, I have to give you some instructions. So, I would appreciate if you could pay attention to what I'll be saying.

The study you will be participating in today is being conducted by myself, Dr. John Wells, and Dr. Joe Valacich, both of whom are professors in the Department of Information Systems. The aim of the study is to determine how consumers behave in an online context. The study should not take more than 25 minutes. All you will need is a pen or pencil to write with. Does anyone need a pencil?

[Pause to hand out pencils, if necessary.]

The study consists of three different parts as you will see on these sheets that I will be passing out in a moment.

[Pause to show the subjects one of the sheets.]

In step 1, you will fill a quick questionnaire, telling us a little more about yourself. The link for this online questionnaire is provided on the sheet that I will be handing out.

[Pause to point at first website address on the sheet.]

Once you fill the questionnaire, please carefully read the information provided on the sheet.

[Pause to point at the scenario on the sheet.]

Next, you will assess the following website based on the provided list of tasks.

[Pause to point at the second website address on the sheet.]

As you go through this list of tasks, please check off the items in the provided column.

[Pause to point at the column on the sheet.]

Once you go through this list and assess the website, the final step is to complete another online questionnaire. You will be asked to rate your interaction with the website.

[Pause to point at the website address for the post-questionnaire.]

Any questions so far?

[Pause to address any questions.]

If you have any questions during the experiment, please don't hesitate to ask. During the next 20 minutes or so, please concentrate on the study only. Do not talk to your friends or look at their screens. When you complete the study, I will be collecting these sheets.

[Pause to show the sheet.]

After the study, I will give Dr. Saputro your names and student IDs so that he can give you the extra credit. Any questions before we start?

[Pause for any questions.]

Great! I will now distribute the sheets. Please don't forget to put your student ID at the top of the sheet. Again, thank you for your participation today.

I will also appreciate if you don't talk about this study to your class mates.

[Hand out the sheets.]

Post-Experimental Procedures

1. Collect the sheets from the subjects and thank them for their participation.
2. Update database with information about the different interfaces used during the sessions and the gender in the scenarios based on the sheets.
3. Send attendance information to the instructor.

APPENDIX H

BACKGROUND QUESTIONNAIRE

Figure H.1: Consent Form

Figure H.2: Background Questionnaire

Figure H.3: End of Background Questionnaire
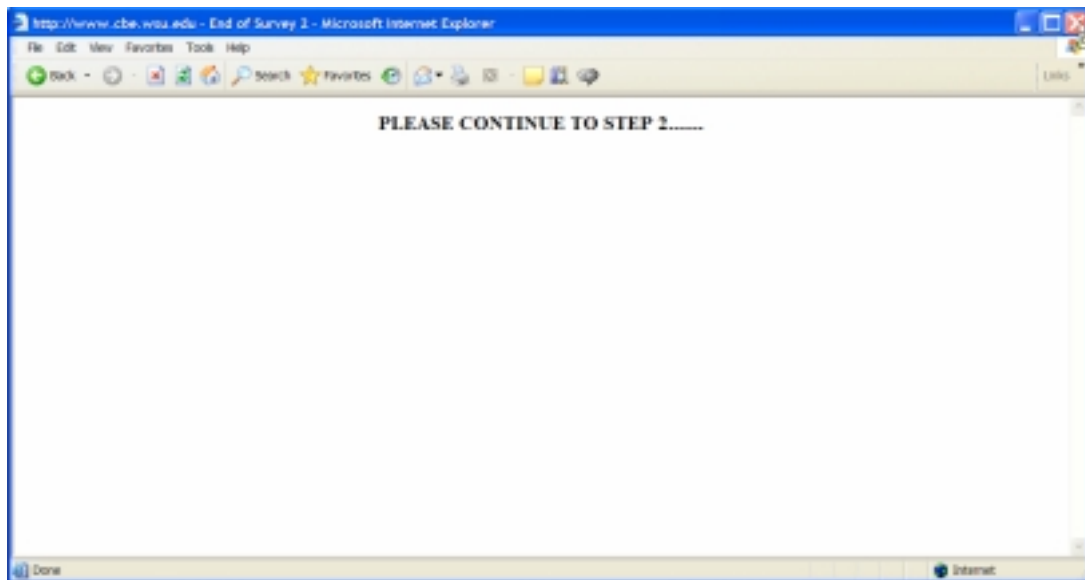
APPENDIX I

POST QUESTIONNAIRE

Figure I.1: Sign-In Screen

Figure I.2: Page 1 of Questionnaire

Figure I.3: Page 2 of Questionnaire

Figure I.4: Page 3 of Questionnaire

Figure I.5: Page 4 of Questionnaire

Figure I.6: Page 5 of Questionnaire

Figure I.7: Page 6 of Questionnaire
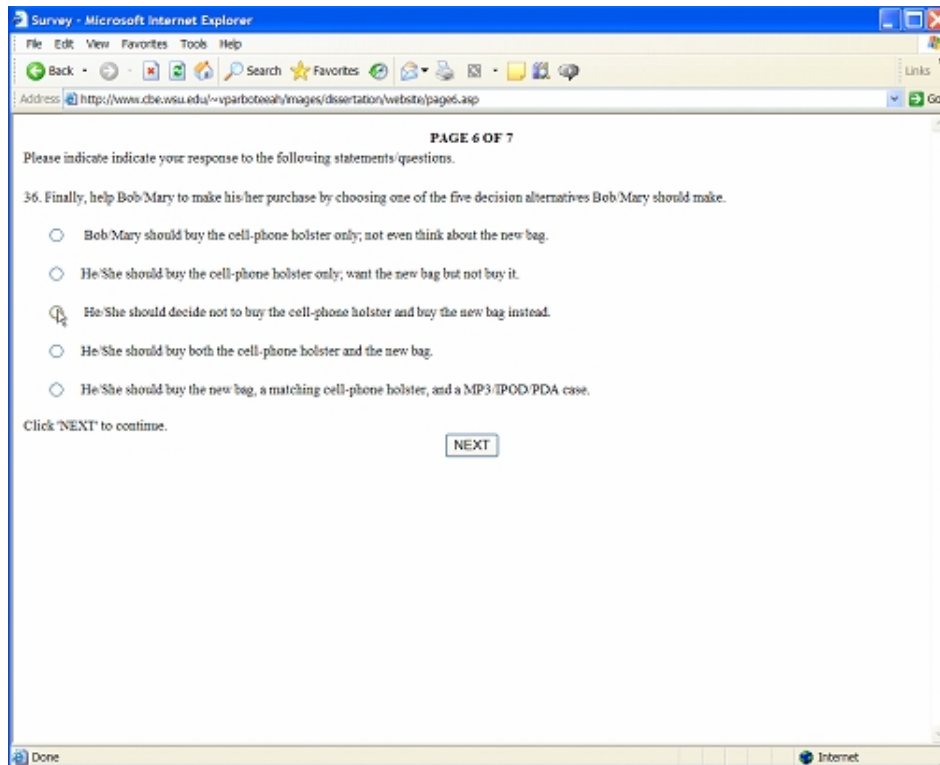
Figure I.8: Last Page of Questionnaire
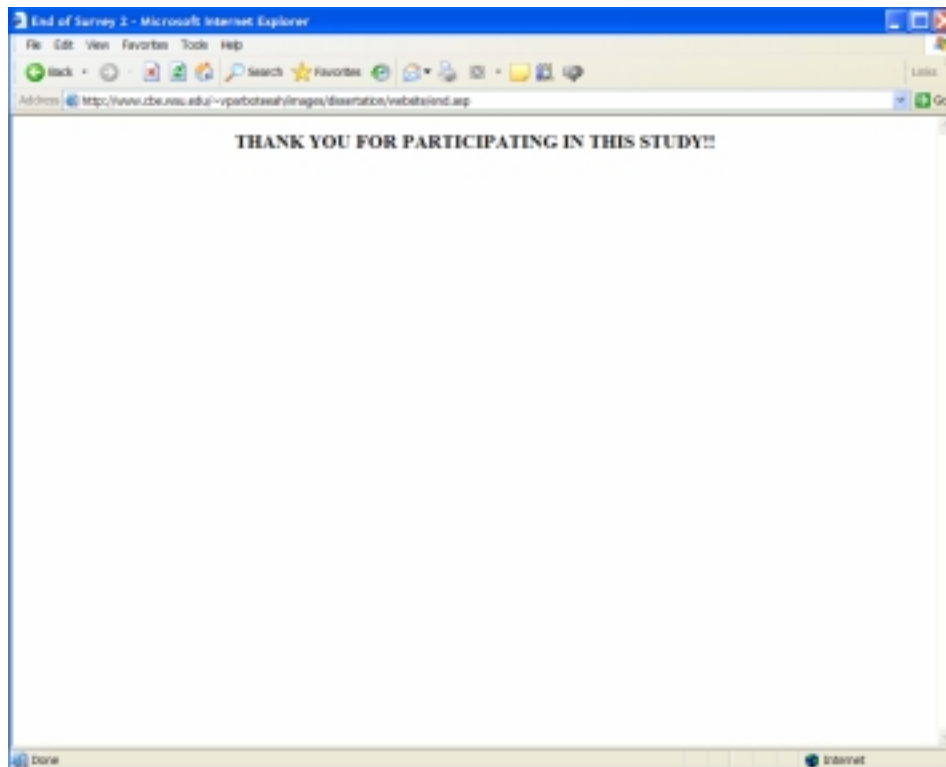
APPENDIX J

ASSESSING DISCRIMINANT VALIDITY

Figure J.1: The Respecified Model
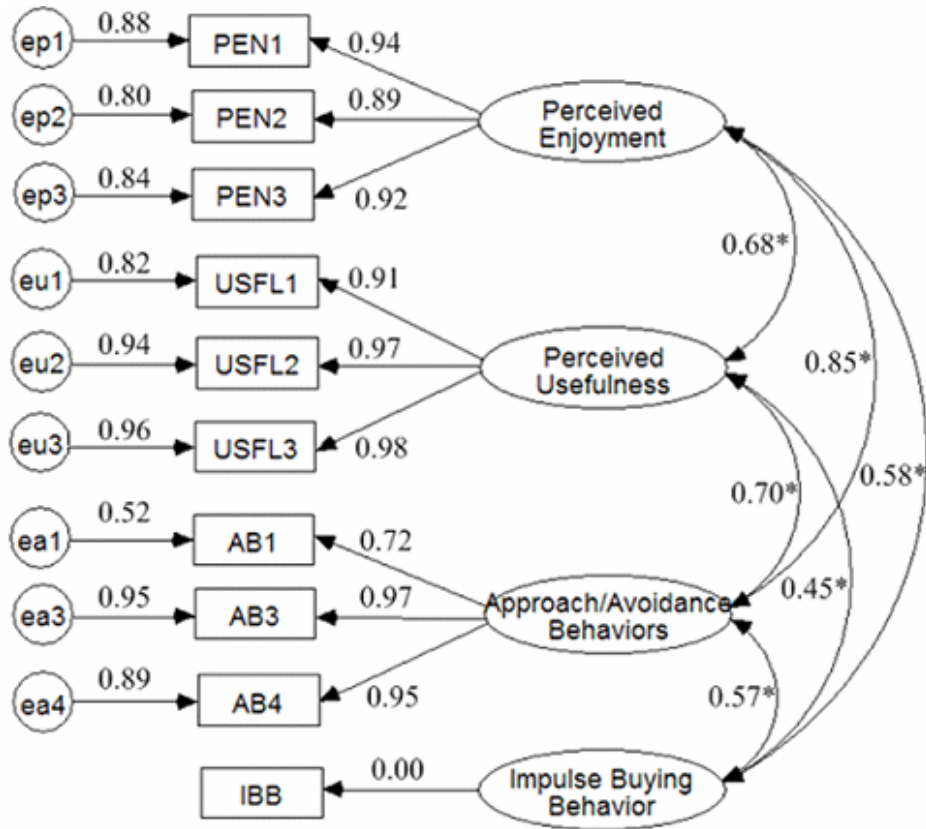
* p < 0.001

Fit Indices

χ^2/df	1.60
GFI	0.96
AGFI	0.93
NFI	0.98
RMSEA	0.05

Figure J.2: Combining Perceived Enjoyment and Perceived Usefulness
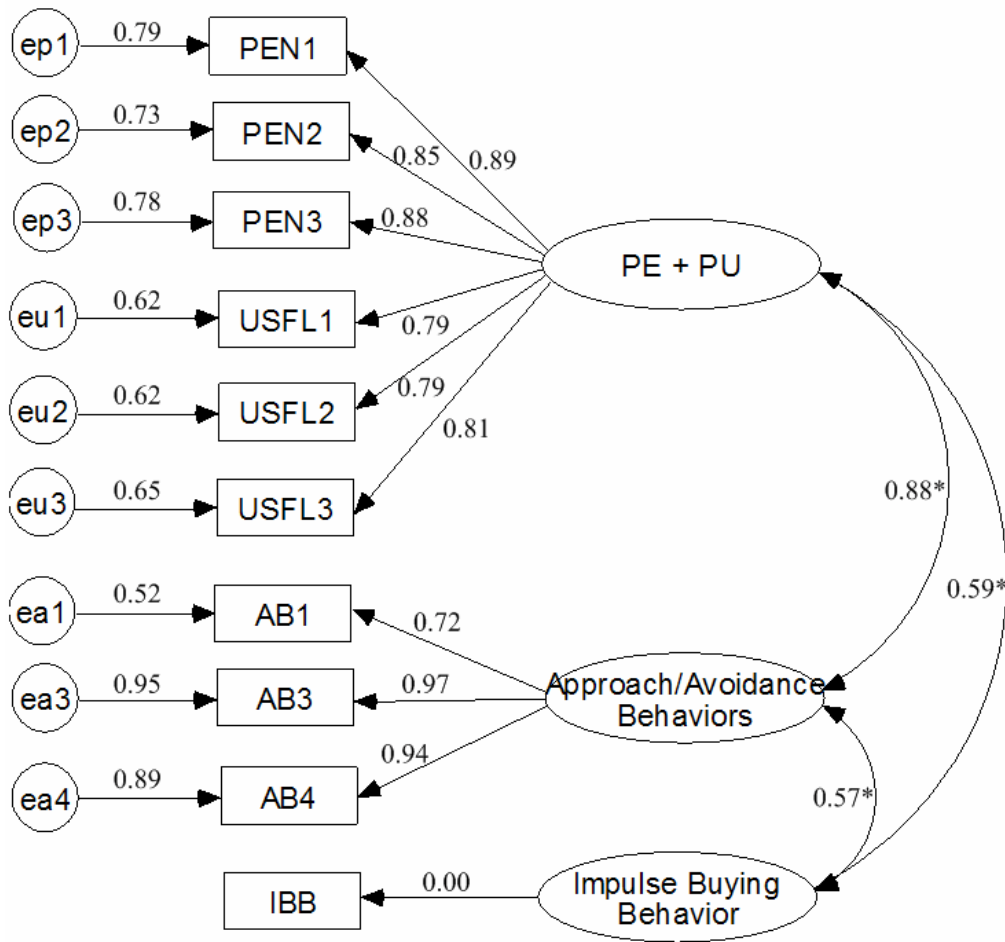
Figure J.3: Combining Perceived Enjoyment with Approach/Avoidance Behavior

* $p < 0.001$

Fit Indices

χ^2/df	6.64
GFI	0.81
AGFI	0.68
NFI	0.91
RMSEA	0.16
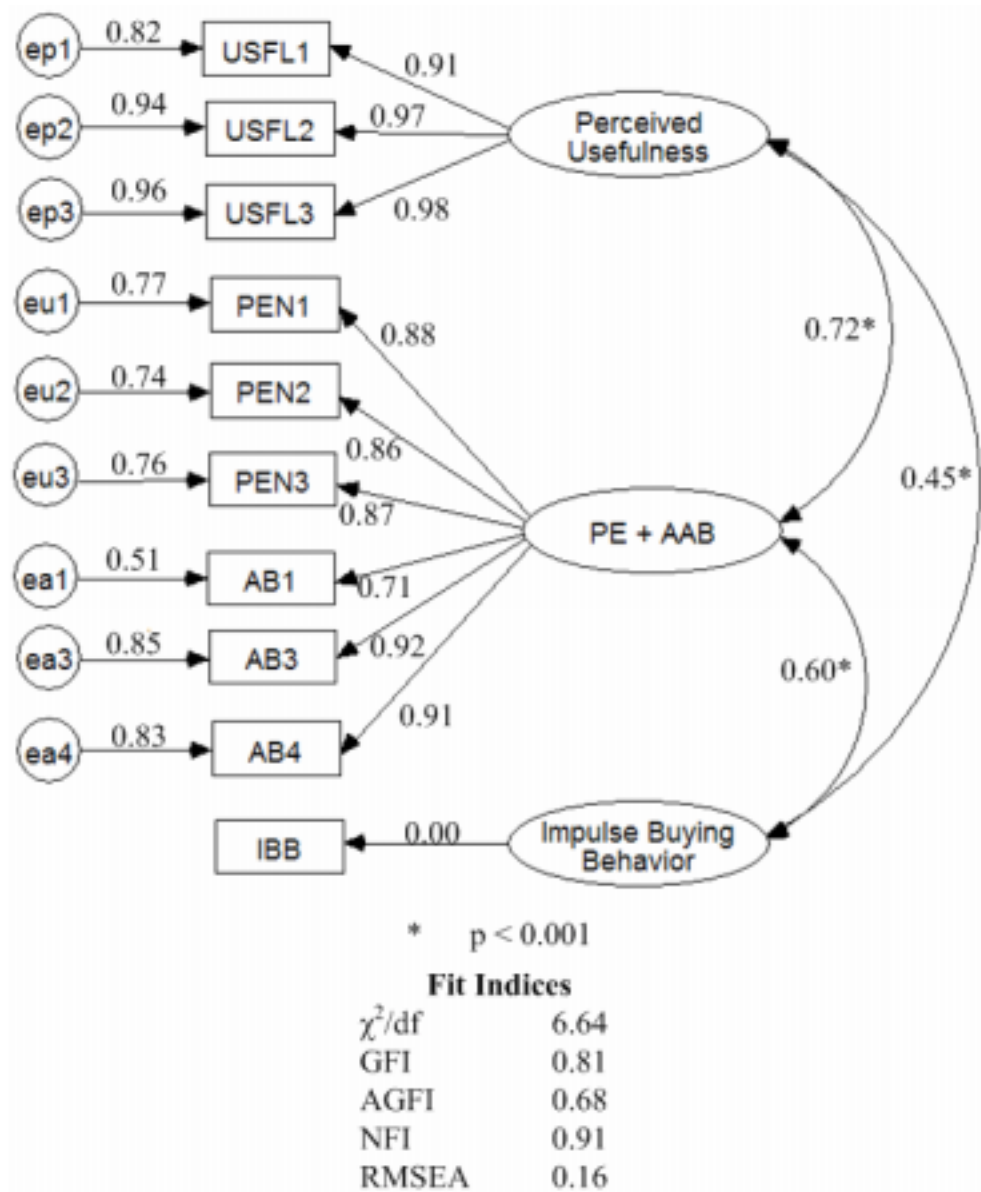
Figure J.4: Combining Perceived Enjoyment with Impulse Buying Behavior
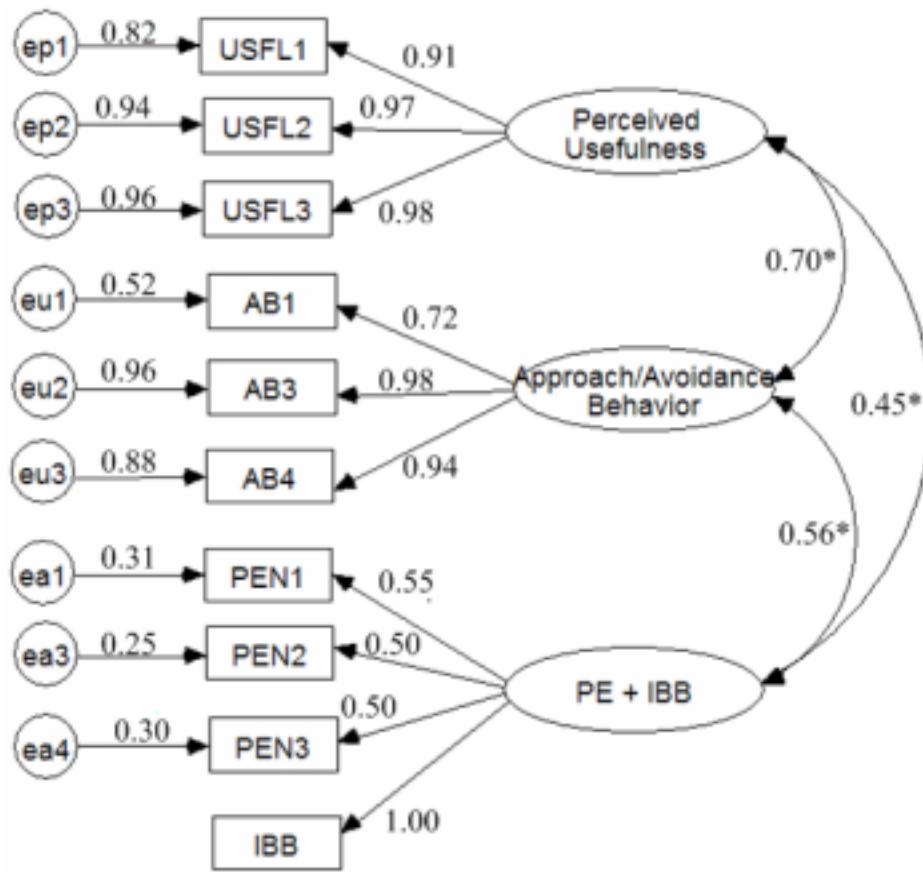
*	p < 0.001

Fit Indices

χ^2/df	20.33
GFI	0.60
AGFI	0.33
NFI	0.73
RMSEA	0.30

Figure J.5: Combining Perceived Usefulness with Approach/Avoidance Behavior

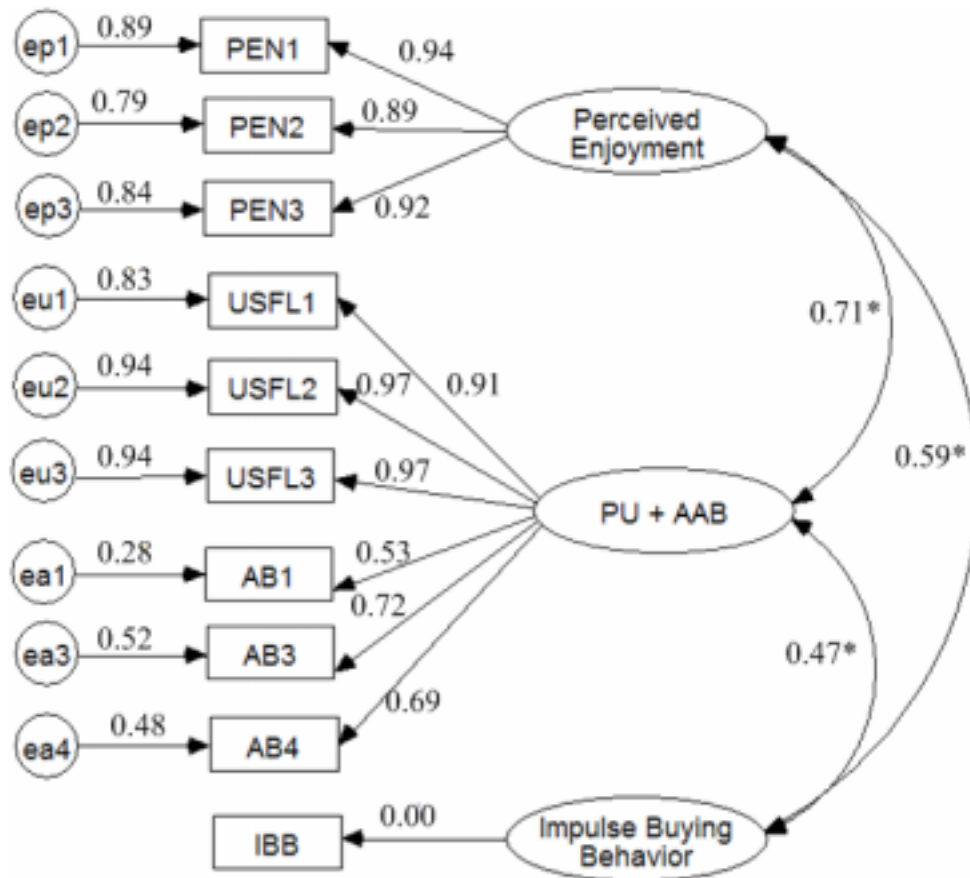**Figure J.6: Combining Perceived Usefulness with Impulse Buying Behavior**
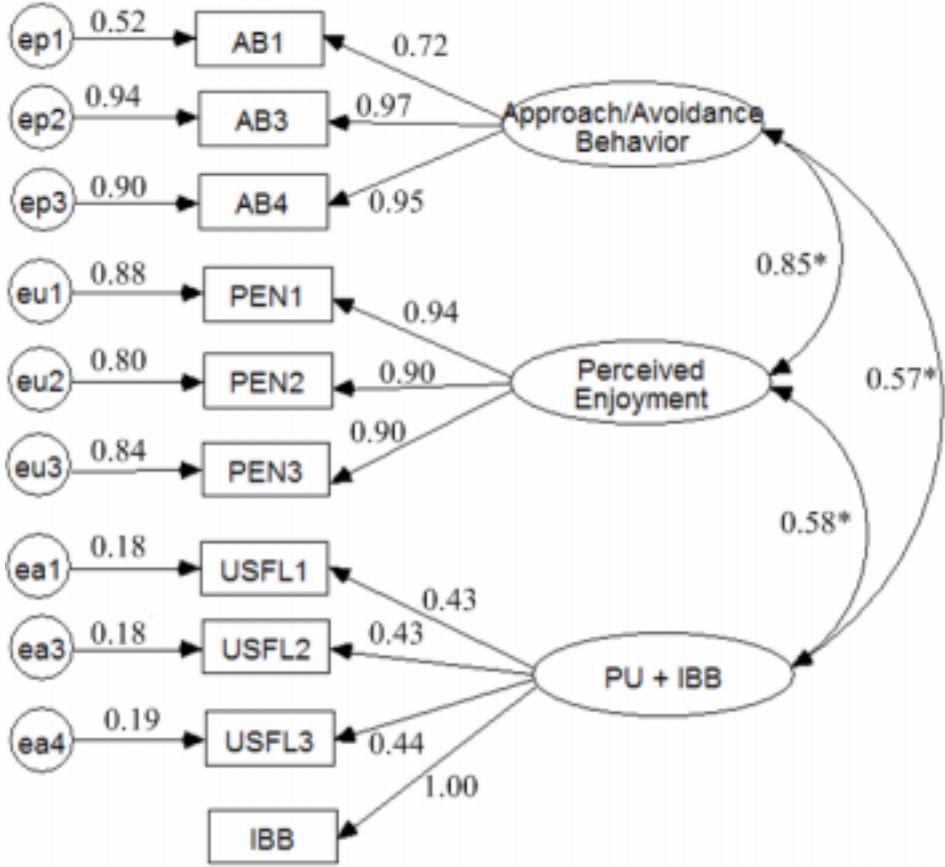
Fit Indices	
χ^2/df	27.57
GFI	0.59
AGFI	0.32
NFI	0.64
RMSEA	0.35

*   p < 0.001

Figure J.7: Combining Approach/Avoidance Behavior with Impulse Buying Behavior
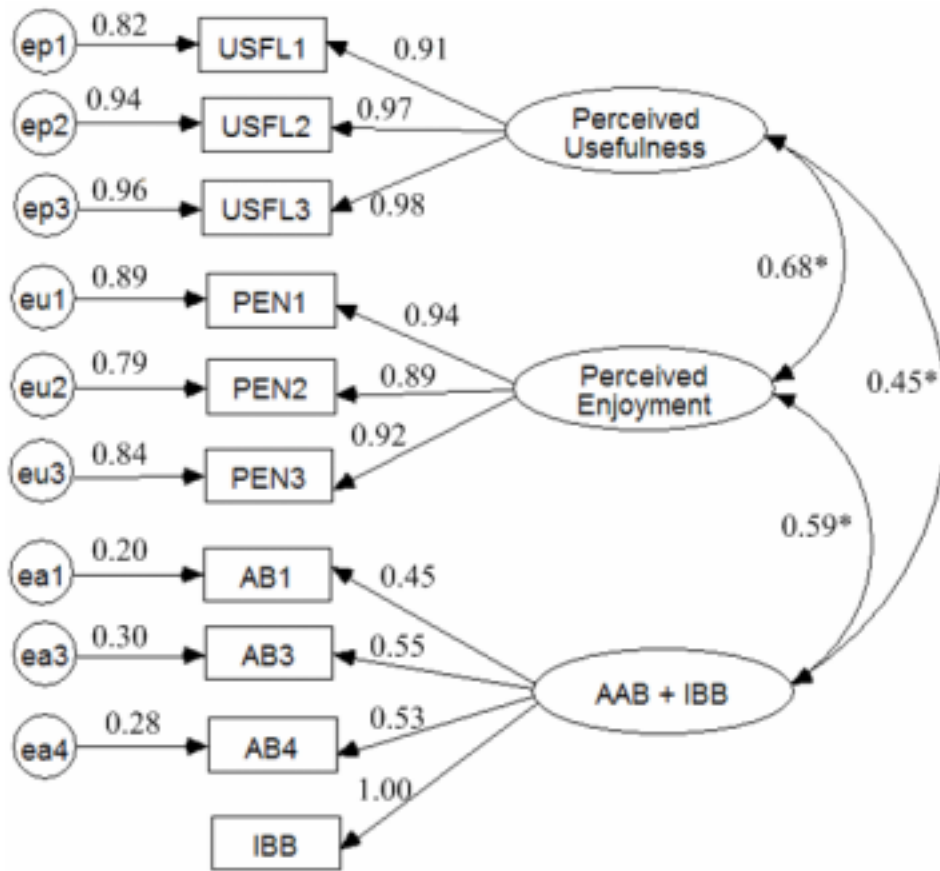
*	p < 0.001

Fit Indices

χ^2/df	20.18
GFI	0.63
AGFI	0.37
NFI	0.73
RMSEA	0.30