

1-26-2011

## Online Impulse Buying: Understanding the Interplay between Consumer Impulsiveness and Website Quality

John D. Wells

*University of Massachusetts Amherst, [jwells@som.umass.edu](mailto:jwells@som.umass.edu)*

Veena Parboteeah

*Eastern New Mexico University, [veena.parboteeah@enmu.edu](mailto:veena.parboteeah@enmu.edu)*

Joseph S. Valacich

*Washington State University, [jsv@wsu.edu](mailto:jsv@wsu.edu)*

Follow this and additional works at: <https://aisel.aisnet.org/jais>

---

### Recommended Citation

Wells, John D.; Parboteeah, Veena; and Valacich, Joseph S. (2011) "Online Impulse Buying: Understanding the Interplay between Consumer Impulsiveness and Website Quality," *Journal of the Association for Information Systems*, 12(1), .

DOI: 10.17705/1jais.00254

Available at: <https://aisel.aisnet.org/jais/vol12/iss1/3>

This material is brought to you by the AIS Journals at AIS Electronic Library (AISeL). It has been accepted for inclusion in Journal of the Association for Information Systems by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Journal of the Association for Information Systems

J AIS 

Research Article

## Online Impulse Buying: Understanding the Interplay between Consumer Impulsiveness and Website Quality\*

**John D. Wells**

University of Massachusetts Amherst  
jwells@som.umass.edu

**Veena Parboteeah**

Eastern New Mexico University  
veena.parboteeah@enmu.edu

**Joseph S. Valacich**

Washington State University  
jsv@wsu.edu

### Abstract

*With the proliferation of e-commerce, there is growing evidence that online impulse buying is an emerging phenomenon, which has been the focus of researchers from a variety of disciplines. This paper reports on two empirical studies that examine the interplay between a consumer's inherent impulsiveness to buy and website quality. Specifically, consistent with past online impulse buying research, website quality manifests as an environmental cue that directly influences the likelihood that a consumer will experience an urge to buy impulsively. Further, highly impulsive consumers can be both positively and negatively influenced by varying degrees of website quality. Thus, while the objective quality of an e-commerce website is important, the inherent impulsiveness of a consumer is also a critical factor for understanding how and why individuals react impulsively to varying degrees of website quality. The implications of the results for both future research and the design of electronic commerce websites are discussed.*

**Keywords:** *Consumer Behavior, Electronic Commerce, Environmental Psychology, Human-Computer Interface, Impulse Buying, Website Quality*

---

\* Dennis Galletta was the accepting senior editor. This article was submitted on 3<sup>rd</sup> August 2009 and went through two revisions.

# Online Impulse Buying: Understanding the Interplay between Consumer Impulsiveness and Website Quality

## 1. Introduction

The continued growth of business-to-consumer (B2C) electronic commerce (e-commerce) has led to a number of research studies aimed at understanding how traditional offline consumer behavior manifests in an e-commerce domain, including establishing trust (Gefen et al., 2003) or evaluating/experiencing products (Jiang and Benbasat, 2004). In offline contexts, one such behavior, impulse buying, can account for between 30 and 50 percent of all retail sales (Hausman, 2000), and even in the aftermath of the 2008 recession, a sample of female shoppers revealed that 60 percent of those surveyed had engaged in an impulse purchase (Dolliver, 2009). Given the prominence of impulse buying in offline retail environments, impulse buying has been identified as a phenomenon that is also prevalent in online contexts (Li et al., 1999).

Generally speaking, impulse buying has been studied from two key perspectives: the state of mind created by the shopping environment (Rook, 1987) or a specific personality trait inherent to the individual consumer (Rook and Fisher, 1995). Building on this prior work, researchers have leveraged both perspectives when investigating online impulse buying. For instance, various environmental cues have been observed to affect a consumer's state of mind (i.e., cognitive or affective reactions) that can positively or negatively influence the urge to buy impulsively (Parboteeah et al., 2009). Alternatively, other researchers have investigated the effect of a consumer's inherent impulsiveness on the intention to conduct online purchases (Zhang et al., 2006). Such studies have advanced our knowledge of online impulse buying, with the former providing solid empirical evidence that the quality of the website (i.e., environmental cue) can influence a consumer's propensity to engage in online impulse buying and the latter study indicating that a consumer's impulsiveness (i.e., individual trait) can lead to more online purchases. Yet, these studies (and other related work) have yet to carefully examine the respective influence of traits (e.g., consumer impulsiveness) and states (e.g., website quality) on impulsive buying behavior.

Some researchers have argued that analyzing any human behavior using this dichotomy of trait versus state may result in an oversimplified, one-sided view of the behavior at hand (Hertzog and Nesselrode, 1987). For instance, traits, by themselves, are not always a good predictor of behavior, because human behavior is often dependent on how individuals react to specific circumstances within a given context (i.e., state) (Mischel, 1973). Yet, an individual's state of mind at any given point in time is inherently volatile, making it less reliable as a consistent predictor of behaviors (Hertzog and Nesselrode, 1987). Thus, to gain a more comprehensive understanding of online impulse buying, the interaction between these two perspectives should be considered (Steyer et al., 1999). However, to our knowledge, there has yet to be a study that investigates the simultaneous, relative effects of state and trait on online impulsive behavior. Therefore, the goal of this paper is to fill this gap in the impulse buying literature by A) examining the respective impact of traits and states on a consumer's propensity to engage in online impulse buying and B) carefully qualifying the interplay between a consumer's inherent predisposition to be impulsive and his or her specific state of mind when engaged in an online buying context.

The rest of the paper is structured as follows. First, we provide a review of relevant theory. Next, we present the research model and hypothesis development. This is followed by a description of two research studies we designed to empirically test the research model and hypotheses as well as a brief presentation of the results. The paper concludes by outlining the implications of this study for theory and practice as well as its limitations and conclusions.

## 2. Theoretical Review

Impulse buying has been defined as "a purchase that is unplanned, the result of an exposure to a stimulus, and decided on the spot" (Piron, 1991, p. 512). Beatty and Ferrell (1998) provide a more extensive definition in that impulse buying is considered to be "a sudden and immediate purchase with no pre-shopping intentions either to buy the specific product category or to fulfill a specific buying task. The behavior occurs after experiencing an urge to buy and it tends to be spontaneous and without a lot of reflection (i.e., it is 'impulsive')" (p. 170).

Stern (1962) has identified different types of impulse purchases, namely pure, reminder, suggestive, and planned impulse purchases. Consistent with the preceding definition, a pure impulse purchase occurs when an individual makes an unplanned purchase after exposure to a stimulus. This type of impulse purchase is characterized by a total lack of planning before the purchase occurs, and represents a novelty purchase that breaks a normal buying pattern. In an online context, idly browsing through iTunes to kill some time, without an a priori shopping goal, and deciding to purchase a song would be considered a pure impulse purchase. A reminder impulse purchase occurs when an individual makes a purchase only after being prompted by seeing the product or some other relevant cue. The individual did not plan to make a purchase until he or she remembered a previous experience with or a need for the product when exposed to it. For instance, a reminder impulse purchase would be if an individual purchases a fragrance product at [www.macys.com](http://www.macys.com) after seeing it on the website and realizing that he or she is running out of that product. In contrast to a reminder impulse purchase, a suggestive impulse purchase occurs when an individual visualizes a need for a product after seeing it for the first time (i.e., the individual had neither prior knowledge of nor desire for the product). For instance, an unplanned purchase of a new product made at [www.amazon.com](http://www.amazon.com) based on the recommendations of the website would be considered a suggestive impulse purchase. Finally, a planned impulse purchase is when an individual does not plan a purchase, but searches for or takes advantage of promotions. The individual goes into a shopping environment with a shopping list, but has the intention of making purchases based on coupons or promotions. Although the concept of a planned impulse purchase "may seem anomalous, it is accurate" (Stern, 1962 p. 60). For instance, such a purchase would result if an individual visited [www.walmart.com](http://www.walmart.com) on Black Friday (i.e., the Friday after Thanksgiving) in search of good deals. In this situation, an individual enters a shopping environment with little to no knowledge of certain products and no explicit intention to buy them, but may very well purchase them based on the terms of the deal (low price, free accessories, etc.). The common thread across these different types of impulse purchases is the unplanned nature of the behavior, whereby the individual buys the product impulsively after being exposed to it.

For deeper insights into any behavioral phenomenon such as online impulse buying, research in psychology has stressed a need to consider both a consumer's inherent traits and his or her current state of mind (Eysenck, 1983). Traits represent the characteristics of individuals that remain relatively stable across situations and can be used to distinguish between two individuals (Hertzog and Nesselroade, 1987). For instance, certain individuals may be inherently shy regardless of the context of the social situation. In the context of impulse buying, several researchers have studied the effect of impulsiveness on consumers' tendencies to buy impulsively, in both offline (e.g., Beatty and Ferrell, 1998) and online (e.g., Zhang et al., 2006; Zhang et al., 2007) shopping domains. Thus, when attempting to understand impulse buying behavior, it is critical to take into account an individual's inherent propensity to engage (or not engage) in such behavior.

Conversely, mental states represent attributes of individuals that tend to change depending on the environmental conditions (Hertzog and Nesselroade, 1987). States can be used to differentiate one situation in an individual's life from another situation. For instance, some individuals may be shy depending on the social situation (e.g., shy around strangers, but not family or friends). Prior research has focused on the role a consumer's current state of mind plays in impulse buying behavior, which can be influenced by both offline (e.g., store atmospherics, Rook and Fisher, 1995) and online (e.g., website characteristics, Parboteeah et al., 2009) environmental cues/factors. Thus, to understand the influence of an individual's state on impulse buying behavior, the environmental conditions have to be considered (Hertzog and Nesselroade, 1987).

Analyzing impulse buying using this dichotomy of trait versus state, however, may reveal an oversimplified, one-sided view of the phenomenon. Such a behavior can be better understood if the interaction between an individual's trait and his or her state at a certain point of time is also considered, along with the direct effect of these factors. This is the main premise of the latent state-trait theory, proposed by Steyer and colleagues (1999), which we will use as a theoretical framework for understanding impulse buying behavior. According to this theory, human behavior is dependent on an individual's traits, the characteristics of the environment (i.e., states), and the interaction between these two sets of characteristics (Steyer et al., 1999). Together, these characteristics lead to a

psychological condition, which would vary depending on the situation or changes in the environment that the individual experiences.

Next, based on the theoretical framework proposed by Steyer et al. (1999), we review past literature on the factors that influence impulsive buying behavior, namely the individual characteristics (i.e., traits), the environmental characteristics (i.e., states), and the interaction between these two factors.

## 2.1. Individual Characteristics

Individuals who frequently engage in impulse purchases often share common personality traits and characteristics (Youn and Faber, 2000). For instance, age is an individual characteristic that has been found to influence impulse buying, whereby younger people tend to be more impulsive than older people (Bellenger et al., 1978). Kacen and Lee (2002) provided evidence for the relationship between culture and impulse purchases. The notion of materialism is a concept whereby an individual uses product acquisition as a self-completion strategy, and individuals who rate high on the materialism scale tend to be more impulsive (Richins and Dawson, 1992). Further, individuals who consider shopping to be a form of entertainment or who rate high on the shopping enjoyment scale are not likely to stick to a buying list and, therefore, tend to make more impulsive purchases (Beatty and Ferrell, 1998). Finally, according to the concept of self-discrepancy (Higgins, 1987), the higher the discrepancy between how an individual sees his or her self (i.e., the actual self) and how he or she would ideally wish to be (i.e., the ideal self), the more the individual is prone to use material goods to compensate for this discrepancy and, thus, the more likely he or she is to be impulsive (Dittmar et al., 1996).

While the traits mentioned in the preceding review have been studied mostly in a traditional shopping context, one trait, a consumer's impulse buying tendency or impulsiveness, has received considerable attention from researchers in both traditional and online shopping contexts. Impulsiveness has been defined as "both the tendencies (1) to experience spontaneous and sudden urges to make on-the-spot purchases and (2) to act on these felt urges with little deliberation or evaluation of consequence" (Beatty and Ferrell, 1998, p. 174). In a traditional retail context, for example, individuals who rated higher on the impulsiveness scale have been found to be more likely to experience urges to buy impulsively and to act on these urges (Beatty and Ferrell, 1998). In an online context, impulsiveness has also been found to positively influence the intention to shop online (Zhang et al., 2006). Yet, a consumer's inherent impulsiveness is only one side of the story. Next, in line with the latent state-trait theory, we review literature that examines the direct effect of the state, or the characteristics of the online environment, on the urge to buy impulsively.

## 2.2. Environmental Characteristics

Cues from the environment have also been found to influence impulse buying in that an individual may experience the urge to buy impulsively when he or she is stimulated by certain circumstantial factors during a shopping interaction (e.g., store atmospherics such as lighting, music, etc.) (Youn and Faber, 2000). In a traditional shopping context, marketers manipulate atmospheric cues in retail settings to trigger impulse purchases (Rook and Fisher, 1995). Similarly, in an online context, several researchers have examined the characteristics of the online environment that lead to impulse purchases (e.g., Adelaar et al., 2003; Kukar-Kinney et al., 2009; Parboteeah et al., 2009). Such environmental cues often manifest themselves as various website characteristics that influence the consumer's behavior. Collectively, these characteristics represent the many facets of website quality (Loiacono et al., 2007). Eroglu and colleagues (2001) proposed a categorization of these characteristics, such that the online environment consists of high task-relevant and low task-relevant cues. 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 security, download delay, and navigability. In contrast, low-task-relevant cues are crucial in creating "an atmosphere that has the potential to make the shopping experience more pleasurable", but are "relatively inconsequential to the completion of the shopping task" (Eroglu et al., 2001, p. 180). Examples of such cues include visual appeal or website pleasantness.

Website quality, thus, depends on the presence of these various characteristics (Wolfenbarger and Gilly, 2003). All websites contain high and low task-relevant cues at differing levels (Valacich et al., 2007). As such, a website that provides environmental cues (i.e., both high and low task-relevant cues) at a high quality level constitutes an online interface of high quality, while a website of poorer quality includes lower quality environmental cues. High quality environmental cues have been found to influence online impulse buying (Parboteeah et al., 2009). Yet, what warrants further examination is how the interplay between an online consumer's inherent impulsiveness (i.e., trait) and high quality environmental cues (i.e., state of mind) influences impulsive buying behavior.

### **2.3. Examining the Influence of both Individual and Environmental Characteristics**

In an offline context, Youn and Faber (2000) studied the effect of both individual traits and environmental cues on impulse buying. In addition to finding main effects for traits and states on impulse buying, they also found that individuals who are impulsive in nature (i.e., impulsivity as a trait) tend to be more reactive to environmental cues (i.e., states), such as advertisements and promotional gifts. However, these results were based on a survey methodology, where subjects were prompted to recall what factors increased or decreased the likelihood that they would be involved in an impulse purchase. Consequently, they call for further research that uses more controlled methods and refined theoretical development to study the interactive effects of personality traits and environmental cues. Despite this call, no known prior research has investigated the interactive effects of these two factors on impulse buying in a controlled environment. Therefore, we pursue this opportunity by examining the interactive effect of personality traits and environmental cues in an online shopping context.

### **2.4. Urge to Buy Impulsively**

When it comes to impulse buying, the consumer's reaction can be two-fold. First, regardless of the impetus (e.g., individual trait or environmental cue), an individual may feel a sudden, spontaneous urge to buy the product (Rook, 1987). The urge to buy impulsively has been defined as "the state of desire that is experienced upon encountering an object in the environment" (Beatty and Ferrell, 1998, p. 172) and has been described as a state that is hedonically complex, sudden, sometimes irresistible, and persistent (Piron, 1991). Next, the individual decides whether or not to act on the urge by purchasing the object of interest. In other words, the impulse purchase occurs only after the individual first experiences the urge to buy impulsively (Rook, 1987). While not all impulsive urges are acted upon, the more urges experienced, the higher the likelihood that an impulse purchase will occur (Beatty and Ferrell, 1998).

Capturing actual impulsive behavior in controlled settings has proven to be quite challenging for researchers (Luo, 2005). Generally, individuals are less inclined to engage in impulse buying when they are being observed (Rook and Fisher, 1995) since impulse buying is typically considered to be an undesirable behavior (Hausman, 2000). Thus, consumer responses in controlled settings can often be biased due to the effect of social desirability (Fisher, 1993). In fact, the dearth of research in the area of impulse buying in non-online settings has been largely attributed to the difficulty in recording actual impulse purchases (Jones et al., 2003). Beatty and Ferrell (1998) also point out that it is very difficult to capture impulse purchases at the most appropriate time and in the most appropriate setting. Likewise, and consistent with these findings, research in online impulse buying has also experienced limited success in capturing actual impulse purchase behavior (Koufaris, 2002).

Given the difficulty and problematic aspects of capturing actual impulse buying behavior, many researchers have utilized the urge to buy impulsively to assess various factors likely to influence actual impulse buying behavior. In a traditional shopping context, Beatty and Ferrell (1998) posited that the urge to buy impulsively was a more accurate representation of impulse behavior. Other researchers have also found this surrogate measure to be very robust and reliable in online contexts (Adelaar et al., 2003; Dutta et al., 2003; Parboteeah et al., 2009; Phau and Lo, 2004). Consequently, we too consider this measure as an appropriate and effective proxy for impulse buying behavior.

### 3. Research Model and Hypothesis Development

Based on the preceding review, we propose that impulsiveness (i.e., an individual trait), website quality (i.e., a state), and the interaction between these two factors influence the urge to buy impulsively (see Figure 1). Next, we provide detailed support and justification for each of the hypotheses in the proposed model.

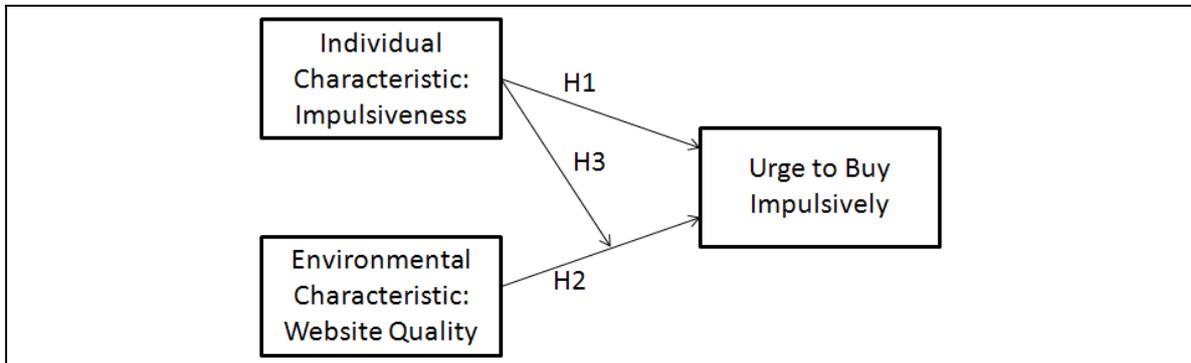


Figure 1. Research Model

#### 3.1. The Effect of Impulsiveness on the Urge to Buy Impulsively

In both online and offline contexts, an individual trait that has received considerable attention is a consumer's impulsive buying tendency or impulsiveness. Past research has shown that individuals can differ considerably in their general tendency to be impulsive, supporting the argument that impulsiveness is a distinct individual characteristic or trait (Rook and Fisher, 1995; Weun et al., 1997). In an online context, Adelaar and colleagues (2003) propose a link between impulsiveness and impulse buying intent, yet they did not explicitly test this relationship. Subsequent research found a positive relationship between impulsiveness and the intention to shop (Zhang et al., 2006; Zhang et al., 2007). This earlier work indicates that impulsiveness seems to influence online consumer behavior, in general, yet it is not specific to online impulse buying. In a traditional shopping context, individuals who rate high on the impulsiveness scale have been found to be more likely to experience increased urges to buy impulsively (Beatty and Ferrell, 1998). Consistent with this finding, we posit that a similar relationship should exist between impulsiveness and the urge to buy impulsively in an online context.

**Hypothesis 1 (H1):** *Individuals with high impulsiveness will experience a stronger urge to buy impulsively compared to individuals with low impulsiveness.*

#### 3.2. The Effect of Website Quality on the Urge to Buy Impulsively

In addition to individual traits, environmental cues are considered a strong determinant of impulse buying (Rook and Fisher, 1995). In an online context, environmental cues have been found to be strong predictors of impulse buying (Adelaar et al., 2003; Parboteeah et al., 2009). The presence of high-quality environmental cues in an online interface increases the website's quality (Loiacono et al., 2007). In turn, different studies have demonstrated the influence of website quality on online impulse buying. For instance, Hoffman and Novak (1996) claim that a well-designed interface increases the likelihood of impulse purchases. Similarly, Wolfinbarger and Gilly (2003) demonstrate the relationship between a well designed website and increased purchase behavior. Further, subtle differences in the design of a web interface have been found to influence the level of impulse purchases at a website (Nielsen, 1999). Thus, a well designed interface or a website of high quality will increase the likelihood of impulse purchases occurring at the website, leading to the following hypothesis:

**Hypothesis 2 (H2):** *Perceptions of high website quality will stimulate a stronger urge to buy impulsively compared to perceptions of low website quality.*

### 3.3. Interaction of Impulsiveness and Website Quality on the Urge to Buy Impulsively

As stated earlier, considering only the effect of impulsiveness OR website quality on the urge to buy impulsively would provide a limited view of this phenomenon. To gain deeper insights into online impulse buying, the interactive effect between individual characteristics and environmental characteristics should also be considered (Hertzog and Nesselrode, 1987). In a traditional shopping context, Youn and Faber (2000) demonstrate that individuals who score high on the impulsiveness scale are more responsive to environmental stimuli that induce impulse buying. Yet, in this particular study where environmental stimuli are framed as a determinant of impulsiveness, they did not study the interactive effect of environmental cues and impulsiveness on impulse buying. Also, Youn and Faber (2000) observe that individuals who rate high in impulsiveness are more sensitive to environmental cues, suggesting that these individuals will be more likely to engage in impulse buying behavior.

Next, we explain the underlying logic for why highly impulsive individuals are likely to react more strongly (i.e., affectively) to environmental cues, particularly from an impulse buying perspective. Exposure to certain stimuli (e.g., environmental cues) can lead to a variety of affective reactions that vary in their valence, ranging from negative (e.g., fear) to positive (e.g., interest) (Smith and Ellsworth, 1985). Further, a theoretical assumption for understanding individual traits (e.g., impulsiveness) is that they represent an “enduring predisposition to response to stimuli across situations” (Thatcher and Perrewe, 2002 p. 383). In turn, we expect that the valence of an individual’s reaction to environmental cues (positive or negative) will lead to more magnified reaction toward an urge to buy (or not buy) impulsively. We test this logic by examining the interaction between impulsiveness and website quality on the urge to buy impulsively in an online context. We propose that, when interacting with websites of varying quality, individuals scoring high on the impulsiveness scale will be more influenced by website quality compared to those who are inherently less impulsive. Our final hypothesis follows:

**Hypothesis 3 (H3):** *A high degree of impulsiveness will have a stronger influence (both positively and negatively) on the relationship between website quality and the urge to buy impulsively versus a low degree of impulsiveness.*

## 4. Method

We designed and administered two studies to test the proposed research model and associated hypotheses. Study 1 uses a survey methodology to validate the constructs in the research model and to gain some initial insight into the interplay between website quality and impulsiveness and the ultimate effect on an individual’s urge to buy impulsively. Study 2 builds on Study 1 by utilizing a controlled laboratory experiment to polarize both website quality and impulsiveness to gain a more focused understanding about how these two factors influence the urge to buy impulsively. We discuss each of these studies next.

### 4.1. Study 1

We designed and administered a survey to investigate the effect of website quality and impulsiveness on an individual’s impulsive urge to buy online. This section outlines the subjects, measures, experimental procedures, data analysis, and results.

#### 4.1.1. Subjects

Participants in the study included 223 undergraduate students from an introductory information systems (IS) class at a large university in the United States. Approximately 29.1 percent of the participants were female, with the average age being 20.9 years. According to the Pew Internet & American Life Project (Jones and Fox, 2009), one of the largest groups that actively engages in online shopping are Internet users between 18 and 32 years old. Thus, we feel confident that this is an appropriate sample for this particular study. Participants received course credit for participating in the study.

#### 4.1.2. Website Quality

We operationalized website quality (WSQ) as a continuous, perceptual variable. Further, we operationalized specific website characteristics as formative measures of WSQ. Prior literature has offered three parsimonious, yet comprehensive, categories of e-commerce interface characteristics (Kim et al., 2002; Valacich et al., 2007): structural firmness (e.g., security), functional convenience (e.g., navigability), and representational delight (e.g., visual appeal). Examples used in the IS literature that apply to these respective categories include security (Koufaris and Hampton-Sosa, 2004; Zhang et al., 2001), navigability (Palmer, 2002), and visual appeal (Tractinsky et al., 2000; Van der Heijden and Verhagen, 2004). We chose these three categories because we wanted to reflect the multi-faceted nature of the WSQ variable, instead of just offering an exhaustive list of WSQ characteristics. Further, these three categories provide a broad representation of both high (e.g., security) and low (e.g., visual appeal) task-relevant cues. We operationalized three variables as proxies, respectively, for each of these categories: security (Pavlou, 2001), navigability (Salisbury et al., 2001), and visual appeal (Loiacono et al., 2007). With the exception of overall WSQ, we adapted all measures from existing, validated scales, and all items used a nine-point Likert-type scale anchored by 1 (Very Low Quality) and 9 (Very High Quality) (see Appendix A, Exhibit A-1 for more details).

#### 4.1.3. Impulsiveness

Subjects were asked to complete a survey designed to capture their impulsiveness. We measured an individual's inherent impulsiveness using four items that we adapted from Rook and Fisher's (1995) Buying Impulsiveness Scale (see Exhibit A-2 in Appendix A for a list of the items).

#### 4.1.4. Dependent Variable

We operationalized the urge to buy impulsively (UBI) using an existing, validated construct (Cronbach's  $\alpha = .96$ ) (Parboteeah et al., 2009). This construct was designed to capture a consumer's current state of impulsiveness after being exposed to a website. The UBI measure utilized a nine-point Likert-type scale anchored by 1 (Strongly Disagree) and 9 (Strongly Agree). See Exhibit A-2 in Appendix A for a list of the items.

#### 4.1.5. Control Variables

We randomly assigned the participants to limit the likelihood that any systematic individual differences would influence the results. Further, we found no statistically significant differences in age ( $F(1, 218) = 0.075, p = 0.784$ ) or gender ( $F(1, 218) = 0.224, p = 0.636$ ).

#### 4.1.6. Procedures

The study took place in a controlled setting. Before being exposed to the experiential stimuli (i.e., website), subjects were asked to complete a pre-survey to determine where they rated on the impulsiveness scale. After the pre-survey was completed, a task sheet was distributed that consisted of three steps. The first step provided the subject with a shopping scenario with a specific shopping goal. The use of scenarios in experimental settings has been found to be an effective lever for understanding impulsive behavior, which assumes that subjects will project themselves in the scenario and exhibit realistic behavior (Rook and Fisher, 1995). Similar to the Rook & Fisher (1995) scenario, we included a specific shopping goal to draw a clear distinction between impulsive and non-impulsive buying, and such a distinction is represented in the UBI measurement items (see Exhibit A-2 in Appendix A). The scenario for Study 1 is as follows:

*You have a friend who owns some fun [SCHOOL NAME] items (e.g., flag, drink cooler, etc.). Your friend likes to tease you that he/she is a more devout [SCHOOL NAME] fan and that you don't support your school in a proper manner. So, given that you are a loyal [SCHOOL NAME] supporter, you've decided that your friend has a point and that you need to get some [SCHOOL NAME] gear as a show of your support. However, you are a student on a fairly tight budget so you can only spend so much. So, you've decided that your SHOPPING GOAL is to find some [SCHOOL NAME] gear, but limit your budget to no more than \$35 (excluding shipping and handling). So, at your earliest convenience, you plan on fulfilling this shopping goal by browsing for [SCHOOL NAME] gear via a website.*

In the second step, participants browsed for products offered by The College Merchandise Company on its website at [www.collegeshade.com](http://www.collegeshade.com)<sup>1</sup> (see Exhibit A-3 in Appendix A). After subjects finished browsing the website, they completed a survey that we administered to gather demographic, WSQ, and UBI data. At the end of the study session, the participants were debriefed, thanked, and released.

#### **4.1.7. Descriptive Statistics and Construct Validation**

Exhibit A-4 in Appendix A contains the descriptive statistics for the continuous variables used in this study. We conducted both construct validation and hypothesis testing using structural equation modeling (SEM), specifically PLS-Graph 3.0. We selected PLS given that it is a component-based SEM application that is able to support both formative constructs and interactions, both of which are represented in our research model. However, before testing the proposed hypotheses, it is necessary to carefully assess construct validity (Gerbing and Anderson, 1988). We modeled WSQ as a second-order, formative construct that was formed by three specific characteristics of WSQ: security, navigability, and visual appeal. We utilized a multiple indicator multiple causes (MIMIC) approach (Diamantopoulos and Winklhofer, 2001) to assess how well these three formative measures loaded on the three reflective items of overall WSQ. Given that all of the constructs in our model (both first- and second-order) had reflective items, we employed the recommended guidelines for assessing PLS factorial validity (Gefen and Straub, 2005).

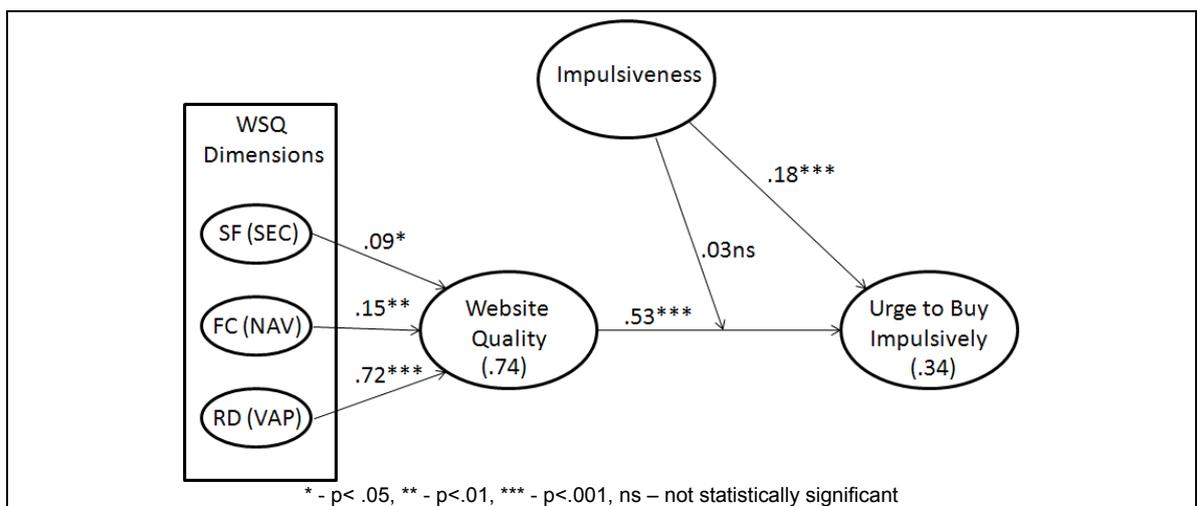
Exhibits A-5 and A-6 in Appendix A provide the results that support our assessment of construct validity. All constructs exhibited good reliability and were well above the recommended internal consistency threshold of 0.7 (Nunnally and Bernstein, 1994). We assessed both convergent and discriminant validity for each construct by examining two key indicators: 1) item loadings and 2) average variance extracted (AVE). For convergent validity, all items loaded on the designated construct with significance level of  $p < .001$ . Further, each construct had an AVE of at least 0.7, which exceeds the suggested minimum threshold of 0.5 (Fornell and Larcker, 1981). From a discriminant validity perspective, an examination of the factor loadings shows that all items loaded strongly on the theoretically assigned construct and were at least an order of magnitude (i.e.,  $> .10$ ) higher than any cross-loadings (Gefen and Straub, 2005). Further, we applied a more conservative AVE analysis to ascertain discriminant validity where the AVE was greater than any correlations of other constructs (Gefen et al., 2000).

Also, we assessed WSQ as a second-order, formative construct by examining the path coefficients from the first-order WSQ characteristics and the variance explained in overall WSQ. All path coefficients to overall WSQ were statistically significant, and the three WSQ characteristics explained 74 percent of the variance in the overall WSQ construct (see Figure 2). Of the three characteristics, visual appeal had the largest effect on WSQ, followed by security and navigability. The results suggest that the three reflective measures of WSQ are representative of the second-order construct formed by the three WSQ characteristics.

Finally, a frequent concern associated with construct validity is that any observed variance may be attributable to the method of measurement and not the operationalized constructs, which is referred to as common method bias (Podsakoff et al., 2003). A popular approach to address common method bias is Harman's single-factor test (Harman, 1976). This technique loads all the variables in a given study as an exploratory factor analysis (EFA) and examines the unrotated solution to see if A) a single factor or B) a general factor accounts for the majority of the variance (Podsakoff et al., 2003). Prior technology acceptance research has used this approach and has indicated that concerns related to common method bias are alleviated should a single or general factor fail to account for the majority of the variance in the study (Lederer et al., 2000). We employed Harman's single-factor test in our study and observed that no single or general factor accounted for the majority of the variance in our study. Thus, we were able to alleviate some of the concerns related to common method bias.

---

<sup>1</sup> For Study 1, we used a live website for an actual company.



**Figure 2. Study 1 - Structural Regression Model**

#### 4.1.8. Hypothesis Testing

We used a structural regression model using PLS-Graph 3.0 (See Figure 2) to test the hypothesized relationships. Further, per recommended guidelines for PLS models (Andreev et al., 2009), we calculated effect sizes using the  $f^2$  value<sup>2</sup>. We found support for H1 (I → UBI), as impulsiveness had a statistically significant effect on UBI with a path weight of .18 ( $p < .001$ ). The strength of this relationship (as indicated by  $f^2$ ) was .047, which, according to well accepted PLS guidelines<sup>3</sup>, indicates a small effect size. Results indicate support for H2 (WSQ → UBI), as WSQ had a statistically significant effect on UBI with a path weight of .53 ( $p < .001$ ). The strength of this relationship (as indicated by  $f^2$ ) was .387, which indicates a large effect size. However, impulsiveness was observed to have a statistically insignificant moderating effect on the relationship between WSQ and UBI with a path weight of .03 (ns) with a minimal effect size ( $f^2 = .002$ ), thus, failing to support H3 (I\*WSQ → UBI).

#### 4.1.9. Discussion of Study 1

The results observed in this study provide two key insights. First, there is confirming evidence of the direct effect of WSQ on UBI (Parboteeah et al., 2009). Independent of other factors (e.g., impulsiveness), varying degrees of WSQ play a major role in influencing online consumer behavior, particularly a consumer's UBI. Second, we observed emerging evidence of the effect of consumer impulsiveness on UBI. While prior research has made tangential inferences to such an effect, the results from this study provide support for the relationship between consumer impulsiveness and UBI. It is interesting to note that consumer impulsiveness did not have the moderating effect on the relationship between WSQ and UBI that we hypothesized (i.e., H3). We can only speculate as to the underlying reasons for this effect failing to materialize. One possibility is that this study used only one website, which was generally perceived to be of reasonably high quality (see descriptive statistics in Exhibit A-4 in Appendix A). Thus, it seems plausible that the lack of sufficient variance in WSQ (i.e., WSQ was positively skewed) caused the moderating effect of impulsiveness on the WSQ → UBI relationship to be statistically insignificant. Given such an assertion, a logical next step is to extend the findings of this study to a subsequent study where WSQ is manipulated into low and high quality extremes. This is presented next.

<sup>2</sup>  $f^2 = R^2_{included} - R^2_{excluded} / 1 - R^2_{included}$ ; Per Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2<sup>nd</sup> edition. Hillsdale, NJ: Lawrence Erlbaum Associates.

<sup>3</sup> Small Effect Size:  $f^2 = .02$ , Medium Effect Size:  $f^2 = .15$ , Large Effect Size:  $f^2 = .35$ ; Per Chin, W. W. (1998) *The Partial Least Squares Approach to Structural Equation Modeling*, in G. A. Marcoulides (Ed.) *Modern Methods for Business Research*, Mahwah, NJ: Lawrence Erlbaum Associates, pp. 295-336.

## 4.2. Study 2

We designed and administered a 2 x 2 controlled experiment to gain a deeper understanding of the interplay between WSQ (high or low) and impulsiveness (high or low) on an individual's UBI. This section outlines the subjects, measures/manipulations, experimental procedures, data analysis, and results.

### 4.2.1. Subjects

Participants in the study included 84 undergraduate students from an introductory IS class at a large university in the United States. Approximately 33.3 percent of the participants were female, and the average age was 20.7 years. Consistent with the rationale outlined in Study 1, participants were deemed appropriate for the study and received course credit for participation.

### 4.2.2. Website Quality

To operationalize website quality (WSQ), we developed two different versions of the experimental interface, where website characteristics were manipulated to create a low and high WSQ dichotomy. We used the same characteristics from Study 1 to create varying degrees of WSQ. We manipulated security via the policy statements on the website along with the inclusion of both the Truste® and Verisign® certification seals. We manipulated the website's navigability via differences in the ease of navigation and the inclusion/omission of certain convenience features such as a shopping cart. Finally, we manipulated the visual appeal of the websites by varying the use of colors (e.g., backgrounds) and graphics (e.g., color tabs for product selection). Thus, overall WSQ was polarized by manipulating the aforementioned characteristics (see sample screen shots in Exhibit B-1 in Appendix B). We measured perceived WSQ using the same items from Study 1 to capture the subjects' perceptions of WSQ when interacting with the experimental interfaces (see Appendix A, Exhibit A-1 for more details).

### 4.2.3. Impulsiveness

Subjects were asked to complete a survey designed to capture their impulsiveness. We measured an individual's inherent impulsiveness using the same items from Study 1 that were adapted from Rook and Fisher (1995) (see Exhibit A-2 in Appendix A for a list of the items).

### 4.2.4. Dependent Variable

The urge to buy impulsively (UBI) was operationalized using the same, validated construct used in Study 1 (Parboteeah et al., 2009). The UBI measure utilized a nine-point Likert-type scale anchored by 1 (Strongly Disagree) and 9 (Strongly Agree) (see Exhibit A-2 in Appendix A for a list of the items).

### 4.2.5. Control Variables

We randomly assigned the participants to limit the likelihood that any systematic individual differences would influence the results. Further, we found no statistically significant differences in age ( $F(1, 78) = 0.087, p = 0.769$ ) or gender ( $F(1, 78) = 0.498, p = 0.482$ ). All information and products on the interfaces were kept constant to avoid any potential confounds due to varying perceptions of product quality. Finally, we asked the participants if they had ever heard of the fictitious organization (i.e., Totbags.com) or the brand of products that were being offered (i.e., Timbuk2 totbags). Any participants who answered affirmatively to either/both questions were removed from the data set.

### 4.2.6. Procedures

Before the experiment, we asked subjects to complete a survey to determine where they rated on the impulsiveness scale. To dichotomize impulsiveness into two categories (i.e., high and low), we placed subjects in either a low or high impulsiveness group if their score was at least greater/less than one standard deviation ( $SD = 1.91$ ) from the mean ( $M = 3.51$ ). The study took place in a controlled laboratory setting. Subjects in both the low and high impulsiveness groups were randomly assigned, yet evenly distributed, to one of the two interface treatments.

We distributed a task sheet that consisted of three steps. Similar to Study 1 and consistent with Rook and Fisher's (1995) prior work, the first step provided the subject with a scenario that consisted of a specific shopping task (i.e., creating the necessary distinction between impulsive and non-impulsive buying):

You are a college student with a part-time job. You own an older tote bag that is a little worn and isn't exactly the latest style. You have recently bought a new cell-phone and need to purchase a cell-phone holster that can be used along with the bag. You plan to spend no more than \$20 for the purchase of this new accessory and would like to get it ordered ASAP. After ordering your cell-phone holster, you would like to browse around the website to see if you can find something to replace your old, worn-out tote bag. Also, you wouldn't mind finding something that would conveniently store your MP3/iPod device. After work, you decide to browse a tote bag retailer's website to A) purchase your cell phone holster and B) browse around and look for a new bag and an MP3/iPod case.

The second step consisted of browsing for products offered by a fictitious tote bag retailer called Totebags.com (see Exhibit B-1 in Appendix B). After subjects finished browsing the website, the third step consisted of a survey that was administered to gather demographic, WSQ, and UBI data. At the end of the study session, the participants were debriefed, thanked, and released.

#### 4.2.7. Descriptive Statistics and Manipulation Checks

Exhibit B-2 in Appendix B contains the descriptive statistics for the continuous variables used in this study. We collected the same measures from Study 1 to verify whether the participants accurately perceived the manipulation of website quality on the two experimental interfaces. These measures included security (Pavlou, 2001), navigability (Salisbury et al., 2001), and visual appeal (Loiacono et al., 2007), as well as perceived WSQ.

Referring to Exhibit B-3 in Appendix B, one can see the differences across the two experimental interfaces. Further, the differences across the individual website characteristics converge with the perceived WSQ measure. Additionally, we conducted t-tests to determine whether these differences were statistically significant. All differences were statistically significant ( $p < 0.05$ ). Thus, the WSQ manipulation appears to have been successful.

#### 4.2.8. Hypothesis Testing

We ran a two-way, between subjects ANOVA to test the proposed hypotheses. The results of the ANOVA are shown in Table 1, with main effect means and standard deviations in Table 2. Impulsiveness did not have a direct effect on UBI, as this test was found to be statistically insignificant ( $\alpha = 0.05$   $F(1, 80) = .928$ ,  $p = .338$ ). The strength of the relationship, as indexed by eta-sq, was .011, which, according to commonly accepted rules of thumb,<sup>4</sup> represents a relatively small effect size. The mean for participants who rated higher in impulsiveness ( $M = 3.92$ ,  $SD = 2.46$ ) was not significantly greater than the mean for those who interacted with a lower impulsiveness ( $M = 3.54$ ,  $SD = 2.00$ ). Thus, contrary to the results from Study 1, no support was found for H1 (I  $\rightarrow$  UBI). However, WSQ had a statistically significant effect on UBI ( $\alpha = 0.05$  ( $F(1, 80) = .35.302$ ,  $p = .0001$ ). The strength of the relationship, as indexed by eta-sq, was .306, which, according to commonly accepted rules of thumb, represents a relatively large effect size. The mean for participants who interacted with a high quality website interface ( $M = 4.90$ ,  $SD = 2.17$ ) was significantly greater than the mean for those with a low quality website interface ( $M = 2.56$ ,  $SD = 1.61$ ). Thus, consistent with the results from Study 1, additional support was found for H2 (WSQ  $\rightarrow$  UBI). Finally, the influence of impulsiveness tended to manifest more dominantly as an interaction with WSQ rather than Study 1's direct effect, as evidenced by the observed statistically significant interaction ( $\alpha = 0.05$   $F(1, 80) = 10.315$ ,  $p = .002$ ). The strength of the relationship, as indexed by eta-sq, was .114, which, according to commonly accepted rules of thumb, represents a relatively medium to large effect size. Thus, support was found for H3 (I\*WSQ  $\rightarrow$  UBI).

<sup>4</sup> Small Effect Size:  $\eta^2 = .01$ , Medium Effect Size:  $\eta^2 = .06$ , Large Effect Size:  $\eta^2 = .14$ ; Per Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2<sup>nd</sup> edition. Hillsdale, NJ: Lawrence Erlbaum Associates.

**Table 1. Study 2 – ANOVA Results**

Source	Sum of Squares	DF	Mean Square	F-Ratio	Sig	Partial Eta Sq.
Impulsiveness	3.048	1	3.048	0.928	.338	.011
Website Quality	115.894	1	115.894	35.302	.0001	.306
Impulsiveness*Website Quality	33.862	1	33.862	10.315	.002	.114
Error	262.635	80	3.283			
C-Total	415.439	83				
R-Squared = .368 (Adjusted R-Squared = .344)						

**Table 2. Study 2 – Main Effect Means (SDs)**

	Low	High	Difference
Impulsiveness	3.54 (2.00)	3.92 (2.46)	0.38
Website Quality	2.56 (1.61)	4.90 (2.17)	2.34
Dependent Variable: Urge to Buy Impulsively			

While these results are interesting, any interactions must be carefully examined to determine how such effects are related to the hypothesized main effects. Thus, to gain a more accurate sense of the interactive effect of impulsiveness and WSQ on UBI, we further examined the nature of the interaction (Jaccard, 1998). First, we conducted a basic means comparison, where impulsiveness was assumed to be the moderator variable.<sup>5</sup> In examining the difference in these means (see Table 3), it appears that the effect of Website Quality on UBI is more pronounced for individuals with high impulsiveness (5.73 - 2.11 = 3.62) than for individuals with low impulsiveness (4.08 - 3.00 = 1.08). Next, we performed a basic simple main effects analysis by comparing high and low WSQ with impulsiveness as a moderating variable (see Table 4), which indicates a significant difference for individuals with high impulsiveness ( $\alpha = .05$ ,  $F(1,80) = 41.890$ ,  $p = .0001$ ) as compared to those with low impulsiveness ( $\alpha = .05$ ,  $F(1,80) = 3.726$ ,  $p = .057$ ). Finally, we offer further insight into the nature of this interaction by providing a plot chart (see Figure 3), which seems to indicate that the interaction tends to be more of a cross-over effect rather than an ordinal interaction (i.e., a magnified simple main effect) (Jaccard, 1998). Unless all main effects are zero (i.e., fully cancelled out by the interaction), then both main and interaction effects should be carefully considered in the results analysis (Rosnow and Rosenthal, 1991). To explain further, an ordinal interaction represents a situation where a main effect and an interaction effect exist simultaneously (i.e., a simple main effect in one treatment level is more magnified than other treatment levels). However, the effects in all treatment levels are in the same direction. Conversely, a cross-over interaction can weaken or eliminate a main effect, as one treatment level may have an effect that is in the opposite direction of other treatment levels, which was the case with H3. This observation offers a possible explanation for why H1 was not supported given the strong moderating effect of impulsiveness when varying degrees of WSQ exist.

**Table 3. Study 2 – Treatment Groups**

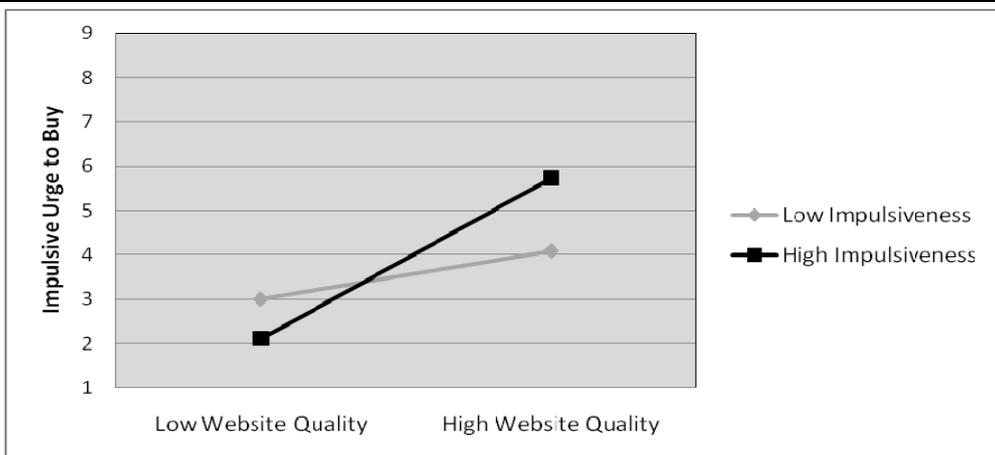
	Low WSQ	High WSQ	Difference
Low Impulsiveness	3.00	4.08	1.08
High Impulsiveness	2.11	5.73	3.62
Dependent Variable: Urge to Buy Impulsively			

<sup>5</sup> When examine an interaction effect as the difference between mean differences, our contrasts were structured as the following null hypothesis:  $(\mu_{\text{hwsq,hi}} - \mu_{\text{lwsq,hi}}) - (\mu_{\text{hwsq,li}} - \mu_{\text{lwsq,li}}) = 0$ ; Per Jaccard, J. (1998) *Interaction Effects in Factorial Analysis of Variance*. Thousand Oaks, CA: Sage Publications.

**Table 4. Study 2 – WSQ Simple Main Effects Results**

Source	Sum of Squares	DF	Mean Square	F-Ratio	Sig
<u>Low Impulsiveness</u>					
Contrast	12.233	1	12.233	3.726	.057
Error	262.635	80	3.283		
<u>High Impulsiveness</u>					
Contrast	137.524	1	137.524	41.890	.0001
Error	262.635	80	3.283		

Note: The F-Ratio tests the simple effects of WSQ within each level of Impulsiveness. Significance based on Bonferroni-correction  $\alpha = .0167 (.05/3)$



**Figure 3. Study 2 - Interaction Plot Chart**

**4.2.9. Discussion of Study 2**

In Study 2, both website quality and consumer impulsiveness were manipulated within an online environment to investigate how the interplay between these two factors influences the urge to buy impulsively. This study extends the results from Study 1 in two key ways. First, the direct effect of WSQ on UBI (Parboteeah et al., 2009) was reaffirmed, providing additional evidence of the significant role that WSQ plays in stimulating online impulse buying. Second, the polarized manipulation of WSQ provided evidence for the moderating effect of consumer impulsiveness on the relationship between WSQ and UBI. Contrary to Study 1, consumer impulsiveness did not directly affect UBI.

**5. General Discussion and Implications**

**5.1. General Discussion**

The results from these two studies provide two key insights. First, there seems to be more evidence that website quality plays a powerful role in stimulating online impulse buying. Independent of other factors (e.g., impulsiveness), varying degrees of website quality influence online consumer behavior, particularly a consumer’s impulsive urges. Second, emerging evidence is provided for the moderating effect of consumer impulsiveness on the relationship between website quality and the urge to buy impulsively.

The results associated with the influence of consumer impulsiveness on the urge to buy impulsively

warrant further discussion. In Study 1, the relationship between consumer impulsiveness and urge to buy impulsively was supported, confirming findings in the context of offline impulse buying (e.g., Beatty and Ferrell, 1998). However, in Study 2, consumer impulsiveness did not directly affect the urge to buy impulsively. This finding can be attributed to the strong moderating effect of impulsiveness when varying degrees of website quality exist. Thus, there is strong evidence that website quality is a key factor that influences the impulsive urge to buy in an online context. When consumers with high degrees of impulsiveness interact with either a high or low quality website, both positive and negative reactions, respectively, appear to be significantly magnified. More specifically, a highly impulsive consumer who interacts with a high quality website is likely to experience a higher urge to buy impulsively compared to a less impulsive consumer. This finding is consistent with H1 in Study 1. However, when interacting with a low quality website, a highly impulsive consumer experiences a lower urge to buy impulsively compared to a less impulsive consumer. So, not only is website quality an important factor for all consumers, but the potential costs/benefits associated with varying degrees of website quality are more magnified with highly impulsive consumers.

## **5.2. Theoretical Contributions**

In this study, we drew on prior impulse buying research to investigate the interplay between consumer impulsiveness and website quality. The results of this research make a few key contributions to the existing body of knowledge on impulse buying. In a traditional context, impulsiveness has been found to positively influence the urge to buy impulsively, yet the role of environmental cues was not specifically qualified in this prior research study (Beatty and Ferrell, 1998). While Youn and Faber (2000) studied the interplay of personality traits and environmental cues in triggering impulse purchases in a traditional shopping context, they used a survey methodology where subjects self-reported their perceptions of various cues (e.g., shopping locations) after the fact. Our study builds on this prior work and helps further qualify the role that impulsiveness plays in an impulse buying context.

Perhaps our most significant contribution is the evidence suggesting that any influence impulsiveness has on impulse buying is contingent on how the environmental cues (e.g., website quality) are perceived – positively or negatively. More specifically, when the quality of the environmental cues (e.g., website) varies considerably, an interaction exists between an individual's impulsiveness and the shopping environment. High quality environmental cues stimulate a positive relationship between impulsiveness and impulse buying, while lower quality cues seem to stimulate a negative relationship. Regardless of the context (offline or online), we feel our results offer a more enlightened understanding of impulse buying by highlighting the importance of understanding the interplay between traits (e.g., impulsiveness) and states (e.g., website quality) on a particular behavior (e.g., impulse buying), as suggested by Steyer and colleagues (1999). To our knowledge, this is the only study that has systematically examined the interplay of these two factors within an impulse buying context. A clear avenue for future research would be to replicate our study in a traditional offline study to see if the interaction holds.

Our results also contribute to the emerging body of online impulse buying literature. In past studies, researchers have examined the main effect of website characteristics on the urge to buy impulsively (Parboteeah et al., 2009). This study supports the premise that a well designed website, regardless of an individual's impulsiveness, increases the likelihood of impulse purchases, as proposed by various researchers (Nielsen, 1999). Yet, the role of impulsiveness in online impulse buying is an important consideration and has received limited attention from prior studies. In particular, prior research has primarily placed impulsiveness in a technology acceptance model (TAM) context without accounting for environmental cues (Zhang et al., 2006; Zhang et al., 2007). Our research builds on this past research by qualifying the role that impulsiveness plays in impulse buying, particularly when individuals are presented with varying degrees of website quality. Thus, we are confident that the results from our study make a meaningful contribution to the emerging online impulse buying body of knowledge.

### 5.3. Practical Contributions

The results from this study provide some prescriptive insight for any organization that is faced with the challenge of dedicating valuable resources to website design. The direct effect of website quality on the urge to buy impulsively reaffirms that an organization must meet a minimum threshold for website quality (Valacich et al., 2007). Regardless of other mitigating factors, website quality is a key factor that influences online consumer behavior, in this case, the urge to buy impulsively. From a subjective perspective, one could look at the results of these studies and argue that a reasonable baseline for website quality is the interface treatment in Study 1 and high-quality interface treatment in Study 2, given that the average urge to buy impulsively for these treatments was close to the midpoint (5.14 and 4.91, respectively) on the UBI scale. Of course, any organization's website must meet an acceptable quality threshold. However, such a website quality requirement should not imply that an organization must commit unreasonable resources to such efforts. The challenge for organizations is to decide when resources dedicated to website quality degrade into diminishing returns. We suggest that the interface treatments used in these studies can provide some broad guidelines for website design.

The results observed related to consumer impulsiveness also have interesting implications for organizations that need to decide where to draw the line with respect to website quality. Our results clearly indicate that consumer impulsiveness can have a positive effect on the urge to buy impulsively when the website is perceived to be of high quality. Conversely, a negative effect on the urge to buy impulsively manifests when the website is perceived to be of low quality. Interestingly, for consumers with low degrees of impulsiveness, perceptions of website quality have less of an impact, positively or negatively, on the urge to buy impulsively. This observation implies that an organization needs a careful assessment of the relative degrees of impulsiveness that may be inherent to its consumer base. Different organizations with different product offerings will attract consumers with varying degrees of impulsiveness. For instance, a specialty retailer (e.g., jeweler) will likely attract consumers with high levels of impulsiveness, while a commodity retailer (e.g., light bulbs) may not attract highly impulsive consumers. Thus, based on the results observed in this study, the impulsive nature of an organization's consumer base (as well as its associated product offerings) may dictate drastically different website quality goals. The commodity retailer would likely have conservative website quality goals (i.e., creating a website with minimal, yet adequate quality). However, a specialty retailer that wants to stimulate more impulsive buying behavior may decide to dedicate more resources to website quality in an effort to stimulate its consumers to experience more of an urge to buy impulsively. Another research opportunity that has important practical implications would be to examine website quality in a more fine-grained manner. In particular, such work would focus on gaining insights as to which antecedents of website quality (e.g., appearance, navigation, etc.) are the greatest catalysts (or detractors) for stimulating impulse purchases in varying product and customer contexts.

Finally, organizations can use some of the insights from this research to leverage some of the more emerging e-commerce techniques that are becoming popular with an increasingly IT-savvy consumer base. Consumer profiles created in more sophisticated customer relationship management (CRM) applications can possibly be mined to make calculated inferences about the relative degree of impulsiveness for individual consumers. Subsequently, in a targeted fashion, the organization could deliver more innovative, dynamic website features that would be well-received by such consumers and, ideally, lead to an increase in impulse buying. Similar profiling techniques could also be applied to other emerging consumer-oriented technologies such as mobile computing and location-based services.

## 6. Limitations and Conclusion

### 6.1. Limitations

Although this study provides some interesting insights, it is not without its limitations. First, the use of student subjects constitutes a bit of a double-edged sword. As noted earlier in the paper, student subjects are considered to be appropriate for online consumer behavior given that this particular

demographic is positively predisposed to shopping online (Jones et al., 2003). Conversely, the homogeneity of the sample can be criticized since it lacks strong generalizability to the general population. While we are confident that our student sample represents a reasonable Internet consumer demographic, additional studies could target a more heterogeneous sample to overcome this particular limitation. Also, the artificial dichotomy of the impulsiveness variable in Study 2 is also limiting, in that we have stripped the continuous nature of this factor and polarized it into two discrete categories. However, given that we hypothesized an interaction, we wanted the ability to plumb into the nature of that interaction to understand how and why such an effect manifests in an e-commerce context. Finally, as discussed in the method section of this paper, we were unable to measure actual impulsive behavior and relied on the urge to buy impulsively as a proxy measure.

## 6.2. Conclusion

In this paper, we have extended the body of knowledge with respect to understanding how and why consumers with varying degrees of impulsiveness react to high and low quality websites (i.e., environmental cues). Consumers with high degrees of impulsiveness tend to be more positively influenced by a high-quality website. At the same time, highly impulsive consumers are more negatively influenced by a low-quality website. Thus, while the objective quality of an e-commerce website is an important factor, an understanding of the inherent impulsiveness of the consumer base is a critical factor for understanding how and why consumers react to varying degrees of website quality. Clearly, these findings provide a foundation for future investigations and practical insights for organizations faced with the challenge of designing websites that stimulate a consumer's urge to buy impulsively.

## References

- Adelaar, T., S. Chang, K. M. Lancendorfer, B. Lee et al. (2003) "Effects of Media Formats on Emotions and Impulse Buying Intent," *Journal of Information Technology* (18) 4, pp. 247-266.
- Andreev, P., T. Heart, H. Maoz, and N. Pliskin (2009) Validating Formative Partial Least Squares (PLS) Models: Methodological Review and Empirical Illustration, in *Proceedings of the Thirtieth International Conference on Information Systems*. Phoenix, Arizona.
- Beatty, S. E. and M. E. Ferrell (1998) "Impulse Buying: Modeling its Precursors," *Journal of Retailing* (74) 2, pp. 169-191.
- Bellenger, D. N., D. H. Robertson, and E. C. Hirschman (1978) "Impulse Buying Varies by Product," *Journal of Advertising Research* (18) 6, pp. 15-18.
- Chin, W. W. (1998) The Partial Least Squares Approach to Structural Equation Modeling, in G. A. Marcoulides (Ed.) *Modern Methods for Business Research*, Mahwah, NJ: Lawrence Erlbaum Associates, pp. 295-336.
- Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2nd edition. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Diamantopoulos, A. and H. Winklhofer (2001) "Index construction with formative indicators: an alternative to scale development," *Journal of Marketing Research* (38) 2, pp. 269-277.
- Dittmar, H., J. Beattie, and S. Friese (1996) "Objects, Decision Considerations and Self-Image in Men's and Women's Impulse Purchases," *Acta Psychologica* (93) 1-3, pp. 187-206.
- Dolliver, M. (2009) Impulse Buying is Alive and Well, in *AdWeek*. November 17, 2009.
- Dutta, R., S. Jarvenpaa, and K. Tomak. (2003) Impact of Feedback and Usability of Online Payment Processes on Consumer Decision Making. *Proceedings of the 24th International Conference in Information Systems*, Seattle, WA, 2003.
- Eroglu, S. A., K. A. Machleit, and L. M. Davis (2001) "Atmospheric Qualities of Online Retailing: A Conceptual Model and Implications," *Journal of Business Research* (54) 2, pp. 177-184.
- Eysenck, H. J. (1983) "Cicero and the State-Trait Theory of Anxiety: Another Case of Delayed Recognition," *American Psychologist* (38) 1, pp. 114-115.
- Fisher, R. J. (1993) "Social Desirability Bias and the Validity of Indirect Questioning," *Journal of Consumer Research* (20) 2, pp. 303-315.
- Fornell, C. and D. Larcker (1981) "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18) 1, pp. 39-50.
- Galletta, D. F., R. M. Henry, S. McCoy, and P. Polak (2006) "When the Wait Isn't So Bad: The Interacting Effects of Website Delay, Familiarity, and Breadth," *Information Systems Research* (17) 1, pp. 20-37.
- Gefen, D., E. Karahanna, and D. W. Straub (2003) "Trust and TAM in Online Shopping: An Integrated Model," *MIS Quarterly* (27) 1, pp. 51-90.
- Gefen, D. and D. Straub (2005) "A Practical Guide to Factorial Validity Using PLS-Graph: Tutorial and Annotated Example," *Communications of the Association for Information Systems* (16) 5, pp. 91-109.
- Gefen, D., D. W. Straub, and M.-C. Bourdreau (2000) "Structural Equation Modeling and Regression: Guidelines for Research Practice," *Communications of the Association for Information Systems* (4) 7, pp. 380-427.
- Gerbing, D. W. and J. C. Anderson (1988) "An Updated Paradigm for Scale Development Incorporating Unidimensionality and its Assessment," *Journal of Marketing Research* (25) 2, pp. 186-192.
- Harman, H. H. (1976) *Modern Factor Analysis*. Chicago, IL: University of Chicago Press.
- Hausman, A. (2000) "A Multi-Method Investigation of Consumer Motivations in Impulse Buying Behavior," *Journal of Consumer Marketing* (17) 5, pp. 403-426.
- Hertzog, C. and J. R. Nesselrode (1987) "Beyond Autoregressive Models: Some Implications of the Trait-State Distinction for the Structural Modeling of Developmental Change," *Child Development* (58) 1, pp. 93-109.
- Higgins, E. T. (1987) "Self-Discrepancy: A Theory Relating Self and Affect," *Psychological Review* (94) 3, pp. 319-340.
- Hoffman, D. L. and T. P. Novak (1996) "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations," *Journal of Marketing* (60) 3, pp. 50-68.

- Jaccard, J. (1998) *Interaction Effects in Factorial Analysis of Variance*. Thousand Oaks, CA: Sage Publications.
- Jiang, Z. and I. Benbasat (2004) "Virtual Product Experience: Effects of Visual and Functional Control on Perceived Diagnosticity in Electronic Shopping," *Journal of MIS* (21) 3, pp. 111-147.
- Jones, M. A., K. E. Reynolds, S. Weun, and S. E. Beatty (2003) "The Product-Specific Nature of Impulse Buying Tendency," *Journal of Business Research* (56) 7, pp. 505-511.
- Jones, S. and S. Fox (2009) *Generations Online in 2009*, in Pew Internet & American Life Project.
- Kacen, J. J. and J. A. Lee (2002) "The Influence of Culture on Consumer Impulsive Buying Behavior," *Journal of Consumer Psychology* (12) 2, pp. 163-176.
- Kim, J., L. Jung, K. Han, and M. Lee (2002) "Businesses as buildings: Metrics for the architectural quality of Internet businesses," *Information Systems Research* (13) 3, pp. 239-254.
- Koufaris, M. (2002) "Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior," *Information Systems Research* (13) 2, pp. 205-223.
- Koufaris, M. and W. Hampton-Sosa (2004) "The Development of Initial Trust in an Online Company by New Customers," *Information & Management* (41) 3, pp. 377-397.
- Kukar-Kinney, M., N. M. Ridgway, and K. B. Monroe (2009) "The Relationship between Consumers' Tendencies to Buy Compulsively and their Motivations to Shop and Buy on the Internet," *Journal of Retailing* (85) 3, pp. 298-307.
- Lederer, A. L., D. J. Maupin, M. P. Sena, and Y. Zhuang (2000) "The Technology Acceptance Model and the World Wide Web," *Decision Support Systems* (29) 3, pp. 269-282.
- Li, H., C. Kuo, and M. G. Russell (1999) "The Impact of Perceived Channel Utilities, Shopping Orientations, and Demographics on the Consumer's On-Line Buying Behavior," *Journal of Computer-Mediated Communication* (5) 2, pp. (n/a)  
<http://www.ascusc.org/icmc/vol5/issue2/hairong.html>.
- Loiacono, E. T., R. T. Watson, and D. L. Goodhue (2007) "WebQual: An Instrument for Consumer Evaluation of Web Sites," *International Journal of Electronic Commerce* (11) 3, pp. 51-87.
- Luo, X. (2005) "How Does Shopping with Others Influence Impulsive Purchasing?," *Journal of Consumer Psychology* (15) 4, pp. 288-294.
- Mischel, W. (1973) "Toward a Cognitive Social Learning Reconceptualization of Personality," *Psychological Review* (80), pp. 252-283.
- Nielsen, J. (1999) "User Interface Directions for the Web," *Communications of the ACM* (42) 1, pp. 65-73.
- Nunnally, J. C. and I. H. Bernstein (1994) *Psychometric Theory*, 3rd edition. New York: McGraw-Hill, Inc.
- Palmer, J. W. (2002) "Web Site Usability, Design, and Performance Metrics," *Information Systems Research* (13) 2, pp. 151-167.
- Parboteeah, D. V., J. S. Valacich, and J. D. Wells (2009) "The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively," *Information Systems Research* (20) 1, pp. 60-78.
- Pavlou, P. A. (2001) *Integrating Trust in Electronic Commerce with the Technology Acceptance Model: Model Development and Validation*. Proceedings of the 7th Americas Conference on Information Systems, Boston, MA, 2001, pp. 816-822.
- Phau, I. and C. Lo (2004) "Profiling Fashion Innovators: A Study of Self-Concept, Impulse Buying, and Internet Purchase Intent," *Journal of Fashion Marketing and Management* (8) 4, pp. 399-411.
- Piron, F. (1991) "Defining Impulse Purchasing," *Advances in Consumer Research* (18) 1, pp. 509-514.
- Podsakoff, P. M., S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff (2003) "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88) 5, pp. 879-903.
- Richins, M. and S. Dawson (1992) "A Consumer Values Orientation for Materialism and its Measurement: Scale Development and Validation," *Journal of Consumer Research* (19) 3, pp. 303-316.
- Rook, D. W. (1987) "The Buying Impulse," *Journal of Consumer Research* (14) 2, pp. 189-199.
- Rook, D. W. and R. J. Fisher (1995) "Normative Influences on Impulsive Buying," *Journal of Consumer Research* (22) 3, pp. 305-313.
- Rosnow, R. L. and R. Rosenthal (1991) "If you're looking at the cell means, you're not looking at only the interaction (unless all main effects are zero)," *Psychological Bulletin* (110) 3, pp. 574-576.

- Salisbury, W. D., R. A. Pearson, A. W. Pearson, and D. W. Miller (2001) "Perceived Security and World Wide Web Purchase Intention," *Industrial Management & Data Systems* (101) 4, pp. 165-177.
- Smith, C. A. and P. C. Ellsworth (1985) "Patterns of Cognitive Appraisal in Emotion," *Journal of Personality and Social Psychology* (48) 4, pp. 813-838.
- Stern, H. (1962) "The Significance of Impulse Buying Today," *Journal of Marketing* (26) 2, pp. 59-62.
- Steyer, R., M. Schmitt, and M. Eid (1999) "Latent State-Trait Theory and Research in Personality and Individual Differences," *European Journal of Personality* (13) 5, pp. 389-408.
- Thatcher, J. B. and P. L. Perrewe (2002) "An Empirical Examination of Individual Traits as Antecedents to Computer Anxiety and Computer Self-Efficacy," *MIS Quarterly* (26) 4, pp. 381-396.
- Tractinsky, N., A. S. Katz, and D. Ikar (2000) "What is Beautiful is Usable," *Interacting with Computers* (13) 2, pp. 127-145.
- Valacich, J. S., D. Parboteeah, and J. D. Wells (2007) "Not All Interface Characteristics are Created Equal: The Online Consumer's Hierarchy of Needs," *Communications of the ACM* (50) 9, pp. 84-90.
- Van der Heijden, H. and T. Verhagen (2004) "Online Store Image: Conceptual Foundations and Empirical Measurement," *Information & Management* (41) 5, pp. 609-617.
- Weun, S., M. A. Jones, and S. E. Beatty (1997) A Parsimonious Scale to Measure Impulse Buying Tendency, in W. M. Pride and G. T. Hult (Eds.) *AMA Educators's Proceedings: Enhancing Knowledge Development in Marketing*, Chicago, IL: American Marketing Association, pp. 306-307.
- Wolfenbarger, M. and M. C. Gilly (2003) "eTailQ: Dimensionalizing, Measuring, and Predicting eTail Quality," *Journal of Retailing* (79) 3, pp. 183-198.
- Youn, S. and R. J. Faber (2000) "Impulse Buying: Its Relation to Personality Traits and Cues," *Advances in Consumer Research* (27) 1, pp. 179-185.
- Zhang, P., G. von Dran, P. Blake, and V. Pipithsuksunt (2001) "Important Design Features in Different Website Domains: An Empirical Study of User Perceptions," *e-Service Journal* (1) 1, pp. 77-91.
- Zhang, X., V. R. Prybutok, and C. E. Koh (2006) "The Role of Impulsiveness in a TAM-Based Online Purchasing Behavior Model," *Information Resources Management Journal* (19) 2, pp. 54-68.
- Zhang, X., V. R. Prybutok, and D. Strutton (2007) "Modeling Influences on Impulse Purchasing Behaviors during Online Marketing Transactions," *Journal of Marketing Theory and Practice* (15) 1, pp. 79-89.

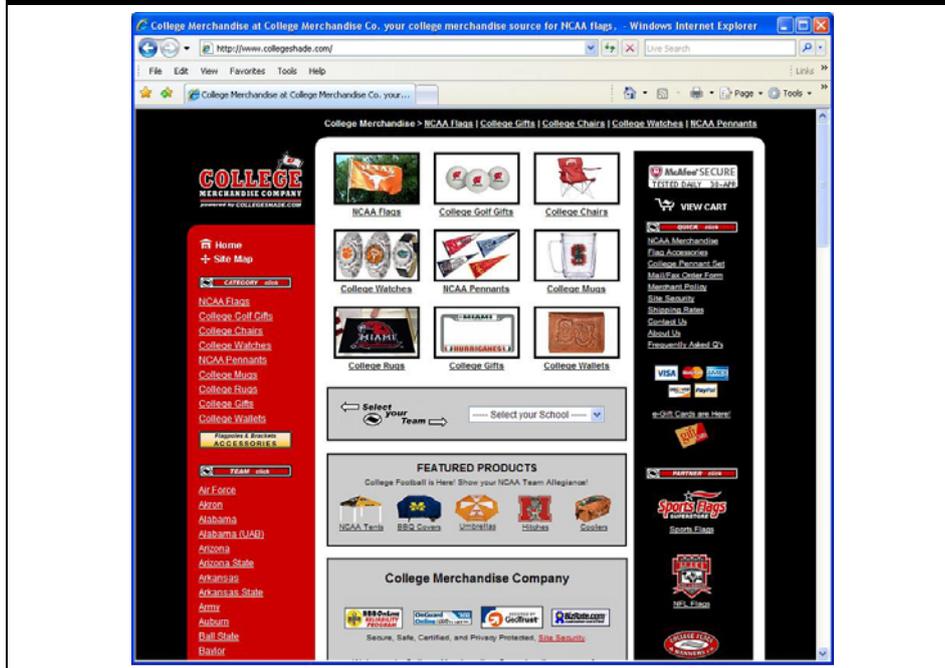
## Appendices

### Appendix A. Study 1 Supporting Exhibits

Exhibit A-1. Website Quality Survey Items	
Construct	Items
<b>Security</b> (Pavlou, 2001)	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.
<b>Navigability</b> (Salisbury et al., 2001)	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.
<b>Visual Appeal</b> (Loiacono et al., 2007)	The website is visually pleasing.
	The website displays visually pleasing design.
	The layout of the website is attractive.
<b>Perceived Website Quality</b>	Overall, how would you rate the quality of this website?
	All things considered, how would you rate the quality of the [Company Name] website?
	How would you rate the overall quality of the [Company Name] website?

Exhibit A-2. Impulsiveness and Urge to Buy Impulsively Survey Items	
Construct	Items
<b>Buying Impulsiveness Scale</b> [Adapted from Rook and Fisher (1995)]	"Just do it" describes the way I buy things.
	I often buy things without thinking.
	"I see it, I buy it" describes me.
	"Buy now, think about it later" describes me.
<b>Urge to Buy Impulsively</b> (Parboteeah et al., 2009)	As I browsed this website, I had the urge to purchase items other than or in addition to my specific shopping goal.
	Browsing this website, I had a desire to buy items that did not pertain to my specific shopping goal.
	While browsing this website, I had the inclination to purchase items outside my specific shopping goal.

**Exhibit A-3. Experimental Website Screenshot**



**Exhibit A-4. Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
imp1	223	1	9	4.19	2.049
imp2	223	1	9	4.34	2.301
imp3	223	1	9	3.68	2.023
imp4	223	1	9	3.59	2.160
wsq1	223	1	9	6.19	1.628
wsq3	223	1	9	6.01	1.686
wsq4	223	1	9	6.03	1.659
sec1	223	1	9	6.76	1.704
sec2	223	2	9	6.70	1.648
sec3	223	2	9	6.78	1.625
nav1	223	2	9	7.06	1.593
nav2	223	2	9	6.52	1.576
nav3	223	2	9	6.76	1.566
vap1	223	1	9	5.96	2.072
vap2	223	1	9	5.86	2.044
vap3	223	1	9	5.66	2.150
ubi1	223	1	9	5.20	2.215
ubi2	223	1	9	5.06	2.275
ubi3	223	1	9	5.15	2.221

<b>Exhibit A-5. Factor Loadings</b>						
	<b>IMP</b>	<b>WSQ</b>	<b>SEC</b>	<b>NAV</b>	<b>VAP</b>	<b>UBI</b>
imp1	<b>0.88</b>	0.16	0.18	0.12	0.22	0.27
imp2	<b>0.91</b>	0.17	0.18	0.05	0.17	0.27
imp3	<b>0.81</b>	0.06	0.08	0.02	0.10	0.13
imp4	<b>0.79</b>	0.15	-0.04	0.04	0.14	0.18
wsq1	0.22	<b>0.95</b>	0.39	0.58	0.80	0.51
wsq3	0.15	<b>0.97</b>	0.41	0.61	0.81	0.53
wsq4	0.16	<b>0.97</b>	0.44	0.62	0.83	0.55
sec1	0.21	0.41	<b>0.92</b>	0.42	0.38	0.27
sec2	0.19	0.39	<b>0.91</b>	0.39	0.32	0.23
sec3	0.20	0.39	<b>0.93</b>	0.38	0.37	0.26
nav1	0.06	0.48	0.38	<b>0.87</b>	0.46	0.27
nav2	0.09	0.67	0.42	<b>0.89</b>	0.65	0.46
nav3	0.10	0.46	0.33	<b>0.87</b>	0.46	0.27
vap1	0.22	0.82	0.38	0.63	<b>0.96</b>	0.55
vap2	0.29	0.79	0.37	0.60	<b>0.96</b>	0.53
vap3	0.22	0.81	0.37	0.54	<b>0.96</b>	0.57
ubi1	0.27	0.55	0.27	0.44	0.59	<b>0.94</b>
ubi2	0.34	0.49	0.26	0.31	0.51	<b>0.95</b>
ubi3	0.28	0.52	0.26	0.37	0.54	<b>0.96</b>

<b>Exhibit A-6. Construct Correlations, Reliabilities, and AVEs</b>								
	<b>CR</b>	<b>AVE</b>	<b>IMP</b>	<b>WSQ</b>	<b>SEC</b>	<b>NAV</b>	<b>VAP</b>	<b>UBI</b>
<b>IMP</b>	.904	.702	<b>.838</b>					
<b>WSQ</b>	.974	.926	.171	<b>.962</b>				
<b>SEC</b>	.941	.843	.137	.430	<b>.918</b>			
<b>NAV</b>	.909	.769	.081	.629	.433	<b>.877</b>		
<b>VAP</b>	.972	.922	.201	.844	.390	.614	<b>.960</b>	
<b>UBI</b>	.965	.902	.269	.552	.277	.396	.575	<b>.950</b>

Note: CR=Composite Reliability, AVE=Average Variance Extracted, Square Root of the AVE is shown in bold on the diagonal  
 IMP=Impulsiveness, WSQ=Perceived Website Quality, SEC=Security, NAV=Navigability , VAP=Visual Appeal , UBI= Urge to Buy Impulsively

## Appendix B. Study 2 Supporting Exhibits

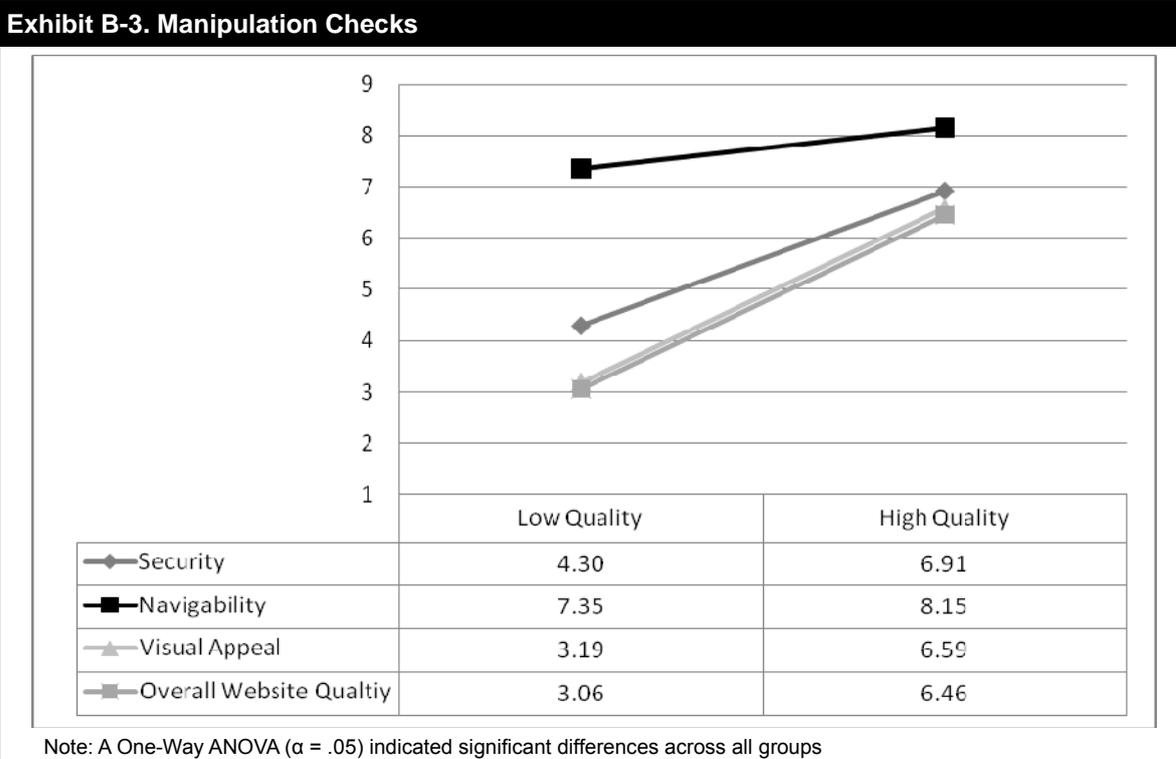
**Exhibit B-1. Website Quality Sample Screen Shots**

Low Quality	High Quality

**Exhibit B-2. Descriptives**

	N	Min	Max	Mean	Std. Deviation
Impulsiveness	84	1.00	9.00	4.57	2.92078
Website Quality	84	1.00	9.00	4.76	2.40890
Urge to Buy Impulsively	84	1.00	9.00	3.73	2.23725

Note: Each of these variables were calculated based on the average of the items used in Study 1



## About the Authors

**John D. WELLS** is an Associate Professor in the Isenberg School of Management at the University of Massachusetts Amherst. He received his B.B.A. degree in Management from the University of Oklahoma and M.S. and Ph.D. degrees in Management Information Systems from Texas A&M University. He has worked as a systems engineer for Electronic Data Systems and the Oklahoma State Senate. He is currently an Associate Editor at *MIS Quarterly* and the *European Journal of Information Systems*. His active research areas are eCommerce strategy and interface design. His work has appeared in such journals as *Information Systems Research*, *Journal of Management Information Systems*, *Decision Sciences*, *European Journal of Information Systems*, and *Information & Management*, as well as in a number of international conferences.

**D. Veena PARBOTEEAH** is an Assistant Professor in the College of Business at Eastern New Mexico University. She has a Bachelor in Textile Technology from the University of Mauritius and a Ph.D. in Management information Systems from Washington State University. Her primary research interests involve electronic commerce and computer interface design. Her work has appeared in such journals as *Information Systems Research*, *Communications of the ACM*, and *Journal of Global Information Technology Management* as well as in a number of international conferences.

**Joseph S. VALACICH** is the Hubman Distinguished Professor of MIS at Washington State University and is an AIS Fellow. He is currently a Senior Editor at *MIS Quarterly* and is also currently serving on the editorial boards at *Decision Science* and *Small Group Research*. His primary research interests include technology-mediated collaboration, human-computer interaction, mobile and emerging technologies, e-business, and distance education. He has published more than 80 scholarly articles in numerous prestigious journals, including: *MIS Quarterly*, *Information Systems Research*, *Management Science*, *Academy of Management Journal*, *Journal of MIS*, *Decision Sciences*, *Journal of the AIS*, *Communications of the ACM*, *Organizational Behavior and Human Decision Processes*, *Journal of Applied Psychology*, and many others. He is also the co-author of several the best-selling textbooks and is a leader in designing national curricula and accreditation standards for the information systems discipline.