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# Do Distractions and Interruptions Mitigate Online Impulse Purchasing?: An Empirical Investigation

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## ABSTRACT

Impulse purchases represent an important source of short-term business revenue. However, impulse purchases can lead to an increase in product returns and can contribute to feelings of buyers' remorse. In this paper, we examine strategies to mitigate online impulse purchasing behavior. Specifically, we apply distraction-conflict theory to a model of impulse buying to investigate a moderating relationship between perceived enjoyment and the urge to buy impulsively. The moderation effect is tested through online distractions and/or interruptions. A controlled laboratory experiment with three interfaces (control, distraction, interruption) was used to test the impact of the moderators. Results indicate that neither a distraction nor an interruption has a significant effect on mitigating the urge to purchase impulsively. Future research opportunities and suggestions for human-computer interfaces are discussed.

## Keywords

Impulse Buying, Electronic Commerce, Consumer Behavior, Human-Computer Interface

## INTRODUCTION

Impulse purchasing, introduced to academics and practitioners over sixty years ago, persists as a widely studied topic in a variety of academic disciplines in multiple settings (Clover 1950; Gardner and Rook, 1988; Parboteeah, Valacich, and Wells, 2009; Peck and Childers, 2006; Sultan, Joireman, and Sprott, 2011; Wells, Parboteeah, and Valacich, 2011). In addition, impulse purchasing remains topical to commerce-driven business professionals, as it accounts for a large number of product sales (Hausman, 2000). Coupled with the continued growth of Internet users and with Forrester Research's projection that online sales will jump from \$172.9 billion in 2010 to \$248.7 billion in 2014, online impulse purchasing is likely to increase (Naveen and Adriana, 1999; Parboteeah, 2005).

Evidence is emerging that online impulse purchasing is rampant (Greenfield, 1999; Li, Kuo, and Rusell, 1999). User Interface Engineering (2001), a leading consulting firm in website usability, reports that approximately 40% of e-commerce purchases are made impulsively. At first, these statements suggest that impulse purchases are crucial to the success of an e-commerce business. However, Greenfield (1999) comments that impulse purchases may result in undesirable consequences, both for a business and a consumer. Greenfield states:

*"Unfortunately, we often see the user returning the merchandise, following a digital version of buyers' remorse, whereby the unique features of the Internet produce an impulse buying situation, followed by guilt and remorse, which can create a consumer binge/remorse/purge cycle that I call 'consumer bulimia'."*

Understandably, the existing online impulse purchasing literature is largely fixated on the antecedents of impulse purchasing behaviors. However, in this paper, we examine potential strategies that contribute to the mitigation of online purchasing behaviors, a gap acknowledged in online impulse purchasing literature (Parboteeah et al., 2009). Specifically, we apply distraction-conflict theory to a model of online impulse buying (Parboteeah et al., 2009) to identify, design, and test interruption- and distraction-based features in an online shopping environment. Our goal is to help to decrease the vulnerability of online consumers to online retailers who encourage impulsive behaviors, and to help assist with the long-term business problems associated with impulse purchasing, as noted above by Greenfield (1999).

The structure of the paper is as follows. In the next section, prior relevant literature is examined to establish a theoretical foundation for studying online impulse purchasing. This is followed by a presentation of a research model with associated hypotheses. An overview of the methodology and the results from two empirical studies are then reported. Finally, future research opportunities as well as implications for human computer interface design are discussed.

## BACKGROUND / LITERATURE REVIEW

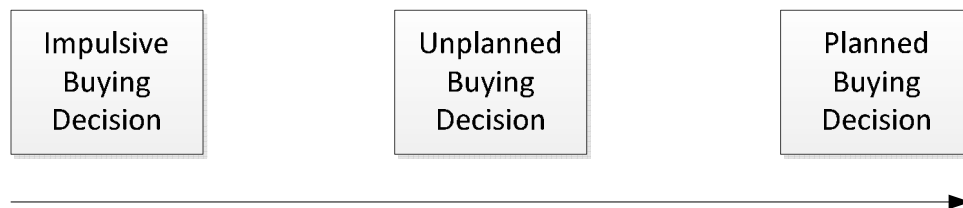
### Impulse Purchases

Impulse purchasing, or impulse buying, is a complex and multi-faceted concept that is continuously evolving. Historically, impulsive purchasing has been depicted as “immature, primitive, and foolish” and as a purchase stemming from an impulsive act (Rook and Fisher, 1995). Generally speaking, impulsive purchasing has been defined in many different ways (Beatty and Ferrell, 1998; Hausman, 2000; Rook, 1987; Rook and Hoch, 1985; Stern, 1962). Piron (1991) integrated definitions of impulse purchasing and impulse buying into a comprehensive definition:

*“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.”*

Madhavaram and Laverie (2004) expanded upon Piron's definition by stating that the impulse purchase is a result of a purchaser's immediate reaction to external stimuli that is often hedonically charged. Moreover, it has been noted that most impulse purchases are for goods that are considered hedonic in nature, not utilitarian (Valacich, Parboteeah, and Wells, 2007). For this study's purpose, the definition provided by Piron (1991) with the expansion by Madhavaram and Laverie, (2004), will be assumed when discussing impulse purchasing.

As depicted in Figure 1, buying decisions occur at three key dimensions: planned purchases, unplanned purchases, and impulse purchases. First, planned buying decisions are those made by consumers equipped with an objective to purchase a particular product or service. For example, a grocery shopper knows he wants to buy an orange and subsequently buys an orange. Second, unplanned buying decisions represent decisions made by customers who aim to purchase but are unaware of their purchase intention(s). For example, a grocery shopper who plans to buy food, but does not know what food he plans to buy. Third, impulsive buying decisions, which are synonymous with impulse purchasing ones, are decisions made by customers who impetuously choose to purchase either on impulse or because of an in-store promotion that acts as a reminder or suggestion (Stern, 1962). For example, consider a grocery shopper who spots a 2-for-1 candy promotion and hastily decides to purchase the candy. These three decisions fall along a continuum and are differentiated by the relative speed at which they occur (Hausman, 2000) (Figure 1). The unplanned buyer's purchase decision is conceived more quickly than the planned consumer's decision, but not as quickly as an impulse buyer's decision.



**Figure 1: Time Investment Continuum for the Buying Decision**

The possibility exists that a consumer can participate in all three decision levels. For example, a grocery shopper knows that he wants to buy a specific box of cereal before driving to the store. He also plans to purchase some form of meat, but does not know what kind. Once in the store, the shopper sees a product display for bananas that catches his or her eye and purchases them spontaneously.

### Why Mitigate Impulse Purchasing?

The reasons to mitigate impulse purchases may not be immediately obvious, but they are relevant to both individuals and businesses. For some individuals, mitigation could help prevent unnecessary purchases. For others, mitigation is a complex concept that is concerned with self-control. The ability to control and regulate impulses, emotions, desires, performances, and

other behaviors is one of the core features of the self (Tice, Bratslavsky, and Baumeister, 2001). Moreover, impulse purchasing is not a harmless act. Consequences may include varying levels of debt, anxiety and frustration, a temporary subjective sense of loss of control, and domestic dissension (O'Guinn and Faber, 1989). Therefore, if a person feels as though he or she momentarily loses self-control, a multitude of negative thoughts, feelings, and negative consequences can pervade. Baumeister (2002) describes three causes of self-control failure:

*"First, conflicting goals and standards undermine control, such as when the goal of feeling better immediately conflicts with the goal of saving money. Second, failure to keep track of (monitor) one's own behavior renders control difficult. Third, self-control depends on a resource that operates like strength or energy, and depletion of this resource makes self-control less effective."*

For businesses, having customers experience negative feelings, such as anxiety, depression, or guilt, as outcomes of a shopping session is not desirable. In a study by Gardner and Rook (1988), subjects were asked to describe their mood following their most recent impulse purchase. Results indicate that about one-fourth of the respondents felt pleasure and excitement, whereas one-fourth felt anxious and guilty. These results imply that by encouraging impulse purchase activity, businesses can impregnate customers with dissatisfaction, which is found to contribute to negative word-of-mouth (Richins, 1983). The short-term benefits from an impulse purchase may be offset by the long-term opportunity costs associated with attracting new customers and/or mending a customer relationship (Trochia and Janda, 2002). Moreover, the ability to mitigate customers' urges to impulsively purchase may result in a net gain for a company. Therefore, limiting impulse purchases could result in fewer unhappy customers and a decrease in returned products. Further, the reduced number of returned products could foster better relations between a company and its suppliers.

Not much is known about how to mitigate impulse purchases made online. Although numerous studies have explored the precursors to online impulse purchasing (Parboteeah et al., 2009; Verhagen and van Dolen, 2011; Wells et al., 2011), none address how to mitigate these purchases. Given both the practical and theoretical relevance of online impulse buying, this study attempts to fill this gap by focusing on the research question: "Can technological distractions and/or interruptions mitigate the urge to purchase impulsively?"

## RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

### Distraction-Conflict Theory

Distraction-conflict theory (Baron, 1986) states that distractions and interruptions facilitate the performance of simple tasks while inhibiting the performance of complex ones. In other words, distractions and interruptions are thought to bring a person's attention away from a complicated primary task and direct his or her attention to a less complicated secondary task. The terms 'distraction' and 'interruption' entail different implications.

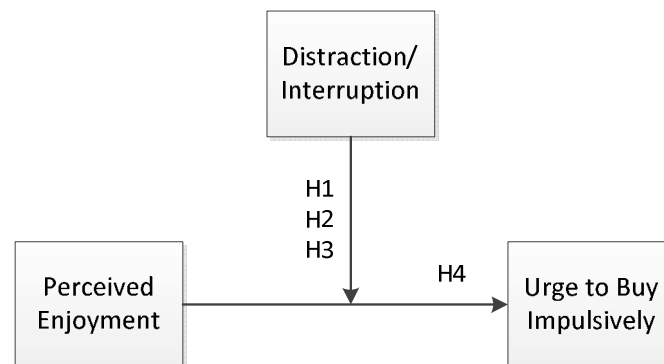
Coraggio (1990) defines an interruption as "an externally-generated, randomly occurring, discrete event that breaks continuity of cognitive focus on a primary task." More simply, interruptions are created by another person or event, and are beyond the control of the individual. In an online context an interruption could simply be a pop-up advertisement that occupies the majority of a computer screen (see Figure 3). This cognitive pull of the interrupting secondary task can cause a person to lose track of the primary task and potentially cause a loss of time, effort, or thought. Interruptions have been found to influence an individual's processing of a specific task (Kahneman, 1973).

Distractions differ from interruptions by how strongly the person's attention wavers from the primary task. They result in capacity interference as the cues from both the primary task and the distraction creates attentional overload (Cohen 1980; Groff, Baron, and Moore 1983). Whereas an interruption requires immediate attention, forcing the user to focus on the interrupting event, distractions can be attended to or ignored concurrently with a primary task.(Covey, 1989, 150–152). An interruption's insistence on action distinguishes it from a distraction. A distraction could be attended to, or ignored, concurrently with a primary task. A banner advertisement could be considered an online distraction.

A snippet of the model of impulse buying (Parboteeah et al., 2009) is presented in Figure 2. Only a portion of the model is used because the antecedents of perceived enjoyment (e.g., environmentally relevant cues and perceived usefulness) are not of interest in the present study (see Parboteeah et al., 2009, for results). Moreover, the original model is grounded in the stimulus-organism-response (S-O-R) framework, which posits that environmental cues act as stimuli that affect an individual's cognitive and affective reactions, which in turn affect behavior (Mehrabian and Russell, 1974). Our concern is only with the response, as indicated by perceived enjoyment (PENJ) and the urge to buy impulsively (UBI).

PENJ is defined as “the extent to which the activity of using a website is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated” (Davis, Bagozzi, and Warshaw, 1989). In an online sense, perceived enjoyment represents one’s belief about how much pleasure one can attain when interacting with a website.

UBI is defined as “the state of desire that is experienced upon encountering an object in the environment” (Beatty and Ferrell, 1998). As previously noted, Piron (1991) defines impulse purchasing as “a purchase that is unplanned, the result of an exposure to a stimulus, and decided on-the-spot.” In an online environment, the UBI denotes the longing a person experiences to impulsively purchase an item after browsing a website. Parboteeah et al. (2009) found that perceived enjoyment had a positive effect on the urge to buy impulsively.



**Figure 2 – Model of Online Impulse Buying Mitigation, Adapted in part from Parboteeah et al. (2009)**

### Effects of Interruptions and Distractions

A person’s response to an interruption depends on the interruption’s frequency, duration, context, complexity, and timing (Kirmeyer, 1988). In one study, Speier, Valacich, and Vessey (1999) examined the characteristics of an online task and its effect on participants’ responses to an interruption. The authors proposed an information overload perspective, suggesting that subjects who perform complex tasks are more likely to perceive the interruption as a form of overload and thereby react negatively. In another study, Zijlstra, Roe, Leonora, and Krediet (1999) found that when a task interruption occurs, people overcompensate by putting forth more effort on the original task. Moe (2006) helped clarify the conundrum between the aforementioned studies. Moe found that a within-page delay (a pop-up ad shown after 15 or 30 seconds) is more likely to result in information overload, leading to not only a lower clickthrough response but also a negative website experience. Such a delay is an example of an interruption, specifically one that occurs as the result of a trigger (i.e., clicking an icon). These interruptions can take different forms, have distinctive messages, and last for disparate amounts of time. Based on the preceding arguments coupled with the empirical evidence, we formulate the following hypothesis:

*H1: An interruption will negatively moderate the effect of perceived enjoyment on a subject’s urge to purchase impulsively.*

A distraction is associated with lesser cognitive appraisal than is an interruption, but some appraisal nonetheless. In their 1975 study, Sanders and Baron challenged the common notion that a distraction negatively impacts a task. The authors hypothesized that a distraction produces “drive-like effects,” such that it helps a user to complete a task. Results of their study confirmed their hypothesis, but only for *simple* tasks. When a *complex* task was undertaken, a distraction “significantly impaired” the task. The current study’s focus rests on complex tasks, such as those presented in an online shopping environment. Complex tasks are defined as those “in which high cognitive demands are placed on the task-doer (Campbell 1988). As our study is concerned with distractions (i.e., banner ads) present when shopping online - a complex task performance - we hypothesize the following:

*H2: A distraction will negatively moderate the effect of perceived enjoyment on a subject’s urge to purchase impulsively.*

This research also posits that there will be a significant difference between distractions and interruptions on the previously found relationship between PENJ and UBI. Rook (1987) suggests that consumers have the most difficult time resisting the urge to impulsively purchase an item in the moments following the encounter with the object. Since interruptions demand a response and cannot be ignored, it follows that an interruption will have a greater moderating effect than a distraction. As the urge to purchase impulsively is a dynamic response to the stimuli of the purchasing environment, we hypothesize that an interruption will be the most effective.

*H3: An interruption will have a greater negative moderating effect than a distraction.*

The relationship between PENJ and purchasing behavior has received mixed results. One such example is Koufaris (2002), who found no support that “consumers with higher shopping enjoyment...make unplanned purchases.” However, Parboteeah et al. (2009) found a positive relationship between PENJ and the *urge* to buy impulsively. As this portion of our model rests on the theoretical underpinnings of Parboteeah et al. (2009), we also posit that PENJ will have a positive effect on UBI.

*H4: Perceived enjoyment will have a positive effect on the urge to buy impulsively.*

## **METHODOLOGY**

A study has been conducted to test the proposed model for understanding how to mitigate online impulse buying. Study 1 is a scenario-based experiment to test the hypotheses, similar to Parboteeah et al. (2009).

### **Experimental Interface**

The interface was inspired by the work of Parboteeah et al. (2009). We created a fictitious online store, WSU Gear, which specializes in selling University-branded clothing and various accessories such as coffee cups. University-branded clothing was chosen as the product of interest because these items, as well as the available accessories, are salient to the participants in the chosen sample. A foremost goal when designing the interface was to make it as realistic as possible. Thus, the interfaces were designed to be similar to existing websites.

### **STUDY**

A controlled laboratory experiment with the three interfaces (control, distraction, interruption) was used to test the hypotheses. To remain consistent with high-quality consumer behavior research, a scenario was administered to stimulate the UBI. The use of scenarios in experimental settings has been found to lead to emotional reactions, such as UBI, in the participants (Rook and Hoch, 1985). The subjects were presented with the following scenario, adapted from Parboteeah et al. (2009) and Rook and Fisher (1995):

Mary/Bob is a 21-year old college student with a part-time job. She/He owns older WSU shirts and items, such as a poster and a coffee mug, that are a little worn and aren't exactly the latest style. She/He has recently bought tickets to a WSU sporting event and is considering the purchase of a pair of WSU sweats that she/he can wear to the event. She/He plans to spend no more than \$15 for the purchase of this new item of clothing, but she/he feels that she/he has enough money to splurge a little if she/he finds something she/he really likes. After work, she/he decides to browse the Internet to purchase the sweats. As she/he is browsing the website, Mary/Bob sees a great looking shirt, which is on sale for \$35, and falls in love with it on first sight. Also, she/he wouldn't mind finding something else to go with the shirt.

To control for gender effects, half of the sample was presented with the female scenario while the other half was presented with the male scenario. No gender effects were found with either PENJ ( $F = .280, p = 0.597$ ) or UBI ( $F = 3.069, p = 0.081$ ).

### **Subjects**

The subjects of the study were a convenience sample ( $N = 237$ ) of undergraduate students enrolled in IS courses in a large university in the United States. Approximately 56% of the subjects were male. The subjects were given extra course credit for participation in the study. All subjects were asked if they had participated in the pilot study, and all that had were excluded from the subject pool. The remaining subjects were then randomly assigned into one of the three conditions.

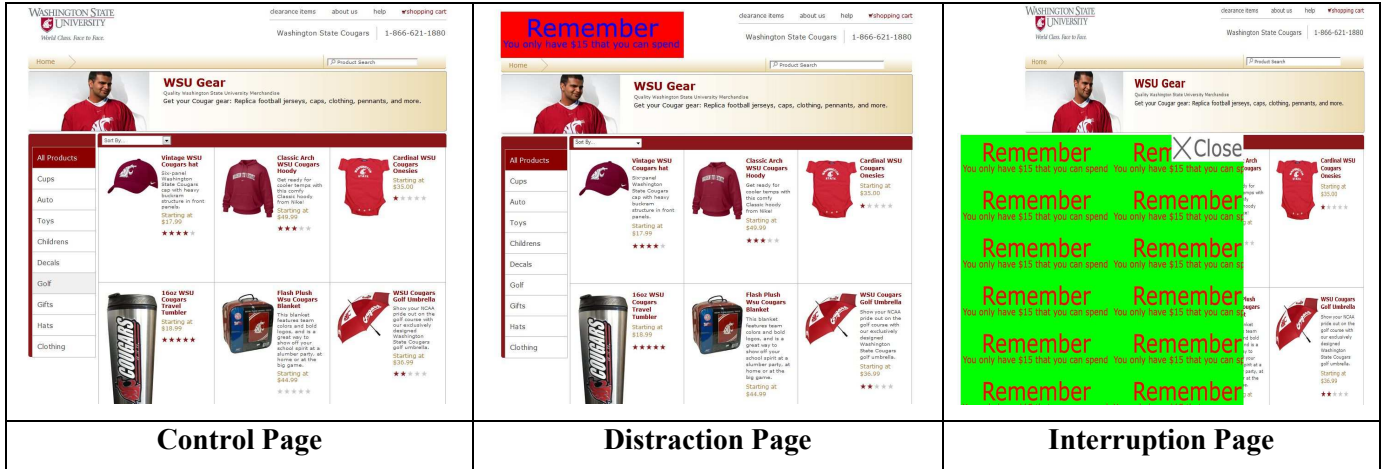


Figure 3: The Three Conditions – Control, Distraction, and Interruption

**Variables**

To manifest the independent variable, three separate versions of the website interface were created; a control, a version with a distraction, and a version with an interruption. A banner ad was selected to represent the distraction. A pop-up ad was selected to represent the interruption. Both the banner ad and pop-up ad flashed between multiple colors to draw attention. The moderators of distractions and interruptions were instantiated by using the same website as the control, but adding only the aforementioned distraction or interruption. Figure 3 shows snapshots of the three different conditions.

Validated measures from Parboteeah et al. (2009) were used for PENJ and UBI. Both measures used a 7-point Likert-type scale anchored by 1 (Strongly Disagree) and 7 (Strongly Agree). Table 1 shows these items.

Wording	Item Loading	Cronbach's $\alpha$
Perceived enjoyment (Chang and Cheung 2001)		0.87
My interaction with this website was enjoyable.	0.87	
My interaction with this website was exciting.	0.79	
My interaction with this website was unpleasant.	0.78	
My interaction with this website was pleasant.	0.88	
Urge to buy impulsively (Parboteeah et al. 2009)		0.94
As I browsed this website, I had the urge to purchase items other than or in addition to my specific shopping goal.	0.89	
Browsing this website, I had a desire to buy items that did not pertain to my specific shopping goal.	0.94	
While browsing this website, I had the inclination to purchase items outside my specific shopping goal.	0.93	

Table 1: Standardized Item Loadings and Cronbach's  $\alpha$

**Procedure**

The study was carried out in a computer room with 45 separate workstations. Subjects were evenly dispersed throughout the room. A single researcher executed all the sessions, using a standard script. Subjects were given the scenario to read. After reading, they were instructed to navigate to the study's website. The website prompted the subjects to click the link pertaining to their randomly assigned condition and to spend adequate time viewing the site. The subjects then completed an online questionnaire containing the items for PENJ and UBI. At the end of the session, the subjects were debriefed and released.

**Analysis**

Table 2 contains the descriptive statistics for PENJ and UBI. The data met the basic assumptions for regression analysis, and both skewness and kurtosis values were within +/- 1 as analyzed by SPSS 20. Table 2 shows the descriptive statistics of the sample.

	N	Min	Max	Mean	Std. Deviation
Perceived Enjoyment (PENJ)	237	1.00	7.00	4.1994	1.22823
Urge to Buy Impulsively (UBI)	237	1.00	7.00	4.2729	1.59495

**Table 2: Descriptive Statistics**

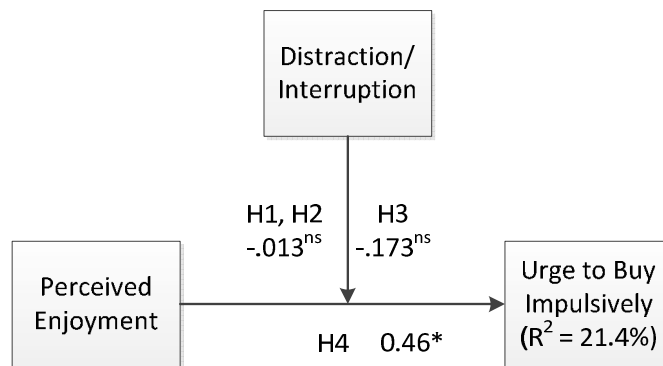
Concerning the measurement model, an assessment of the fit statistics (Table 3), using maximum likelihood estimation in MPlus 5.1, indicates that the fit of the model is acceptable. The model has a chi-square value of 24, 13 degrees of freedom, and a *p* value of .03. This is likely significant because the chi-square nearly always rejects the model when large samples are used (Bentler and Bonnet, 1980). Cronbach’s  $\alpha$  was used to assess the reliability of the latent variables. Since the values are greater than 0.70, acceptable reliability was achieved (Nunnally and Bernstein, 1994). The correlation between PENJ and UBI was 0.473, demonstrating initial discriminant validity.

Fit Indices	Observed Value	Recommended Value
$\chi^2/df$	1.85	Less than 3 (Gefen, Straub, and Boudreau, 2000)
CLI	0.99	Greater than 0.95 (Hu and Bentler, 1999)
TLI	0.98	Greater than 0.95 (Hu and Bentler, 1999)
RMSEA	0.06	Less than 0.06 (Hu and Bentler, 1999)
SRMR	0.04	Less than 0.08 (Hu and Bentler, 1999)

**Table 3: Fit Statistics**

**Hypothesis Testing**

To begin the hypothesis testing, the structural model for UBI on PENJ was assessed with linear regression in SPSS 20. As shown in Figure 3, the path was significant. PENJ had a significant effect on the UBI, thus supporting H4.



**Figure 3: Model with Standardized Regression Weights. \* - *p* = .001. R<sup>2</sup> – explained variance.**

Once PENJ was found to have a significant effect on UBI, H1, H2, and H3 were assessed with multiple regression using SPSS 20. Two contrast-coded variables were created to test the hypotheses, given a continuous dependent variable and a categorical moderator. The results are in Table 4. Surprisingly, neither the distraction nor the interruption had a significant effect on the PENJ – UBI relationship. This is not consistent with the assumed theoretical ideas.



	Standardized Beta	T-Value	Significance
PENJ	0.364	5.753	0.000
Distraction	-0.001	-0.020	0.984
Interruption	-0.015	-0.238	0.812
Distraction Interaction	-0.005	-0.069	0.945
Interruption Interaction	0.012	0.199	0.843

**Table 4: Moderation and Interaction Results**

### Discussion of Study 1

The results of Study 1 provide an interesting look into the efficiency of distractions and interruptions as mitigators for online impulse shopping. H1, H2, and H3 are not supported. H4, a previously-established path (Parboteeah et al., 2009), was supported as expected. The results from H1, H2, and H3, though contrary to our hypotheses, are of value. This study supports the notion that banner ads and pop-up ads do not cause a significant decrement in the urge to buy impulsively. This is potentially useful to marketers and ecommerce, as advertisements are a revenue stream for many different types of sites.

### LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

All studies have limitations that can impact the findings, and this research is no exception. Moreover, explanations for the limitations could help explain the results and promote opportunity for future research. The first limitation is that this study used a sample of university students, so generalizability can be questioned. A replication of this study utilizing a different sample base would increase the generalizability of the results. Second, the UBI was employed as the dependent variable, instead of the actual behavior of online impulse purchasing. Replicating our model and testing for actual behavior as the dependent variable could provide further insight into impulse purchasing behavior. Third, a hypothetical example was used to investigate impulse purchase and may not represent real world results. As such, future research should explore impulse purchases in a real-world setting.

Additional suggestions for future research should also be considered. One such suggestion is to investigate if the effects of distractions are temporally affected. Another suggestion is to test subjects that are diagnosed with compulsive buying-related disorders. Significant results of testing mitigation technologies on these subjects could lead to a treatment. Another direction would be to examine the distractions/interruptions as mood- and task-relevant characteristics as per Parboteeah (2009). Lastly, a longitudinal study of companies who have embraced distraction or interruption strategies would prove beneficial.

### CONCLUSION

In summary, impulse purchasing is a serious problem for many online shoppers. This study provides a theoretical grounding on which practitioners and researchers could build a basis for investigating strategies to reduce impulse purchases. Findings indicate that certain types of interruptions and/or distractions do not significantly mitigate the urge to purchase impulsively. Future research should investigate different online interruption or distraction types and how these types impact impulse purchasing behavior. Nonetheless, this study explored a topic in its infancy while simultaneously strengthening a maturing stream of research.

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