

THE IMPACT OF PRESENTATION MODE AND PRODUCT TYPE ON ONLINE IMPULSE BUYING DECISIONS

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ABSTRACT

As the online shopping industry grows, more and more consumers are engaging in online impulse purchases. However, very few studies have explored the underlying causes behind this phenomenon. Based on the Stimulus-Organism-Response framework, this research proposes two factors: presentation mode and product type which affect consumer's emotional states (pleasure and arousal), and lead to impulse buying decisions. We also investigate the moderating effects of product involvement and impulse buying tendency. A 2x2 laboratory experiment is conducted that includes product presentation mode (virtual product experience and static image) and product type (hedonic and utilitarian) to test several hypotheses. Our study indicates that online retailers need to take special care when marketing utilitarian products. For utilitarian products, offering a high quality web design interface and taking steps to enhance consumers' product involvement are important for eliciting positive emotions and ultimately inducing an impulse buying decision.

Keywords: Online impulse buying; Emotion; Product type; Presentation mode; Product involvement

1. Introduction

Prior research on online purchase behavior has focused primarily on rational and planned purchasing [Ghosh 1998; Keeney 1999; To et al. 2007]. However, just like in-store shopping, consumer purchase behavior on the Internet can at times be impulsive and is not well understood. According to the investigation by Shoppercentric [2011], more online shoppers are buying on impulse now than ever before. The percentage of shoppers who admitted to buying high-ticket items electronically on impulse grew to 28 % in 2011. In the same year, the number of grocery categories that a shopper bought impulsively increased by a third since 2008. Interestingly, Donthu & Garcia [1999] studied profiles of online shoppers and found that online shoppers were more impulsive than offline shoppers. As impulse

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buying is an emotional decision, in this paper, we analyze three stimuli that affect the emotional state of an individual, namely product presentation, product type, and product involvement. We also analyze the effect of emotional state on the urge to buy impulsively.

Koufaris [2002] examined how emotional and cognitive responses to online stores can influence unplanned purchase decisions. The studies of Adelaar et al. [2003] and Parboteeah et al. [2009] emphasized how web interfaces affect online impulse buying. In the online store environment, consumers can only evaluate products using online features rather than physical examination. Thus, the excitement produced by the direct experience of the product as well as the social experience of traditional shopping are lessened. Therefore, it is all the more important to examine the recent surge in online impulse purchases as it would increase our understanding as well as aid online retailers in developing successful online shopping environments. While it may be difficult to present the dynamic characteristics of a product in an online environmental context [Jiang 2007a], with newly developed multimedia presentation modes, online stores may be able to stimulate consumer emotion, reduce consumer self-regulation, and ultimately induce impulse buying [LaRose 2001]. In this context, virtual product presentations have become increasingly important in attracting online impulse shoppers.

Different types of products can also stimulate impulse buying. Hedonic products provide more experiential emotions, such as fun, pleasure, and excitement, whereas utilitarian products are primarily instrumental and functional [Hirschman & Holbrook 1982]. Previous studies suggest that consumers react to products according to their relative hedonic or utilitarian natures [Hirschman & Holbrook 1982]. Chiou & Ting [2011] believed that consumers are willing to spend more money on the Internet when products offer more hedonic values. Past research also suggests that impulse buying can satisfy hedonic emotion [Piron 1991]. Thus, the influence of different product types on online consumer impulse buying decision is an important issue to investigate.

Product involvement also plays a significant role in the consumers' purchase decision [Zaichkowsky 1986]. Bian & Moutinho [2011] define product involvement as "consumer's enduring perceptions of the importance of the product category based on the consumer's inherent needs, values, and interests". Product involvement is usually higher for more expensive products (e.g., computers and cars) on which consumers spend a considerable amount of time in research and evaluation. Involvement is an important determinant of consumer motivation to purchase [Zhang & Markman 2001]. Consumers with a high level of product involvement are more likely to experience strong emotions in a specific product type, and in turn, generate the emotions needed for impulse buying [Jones et al. 2003].

Given the above arguments, this study examines the direct impact of presentation mode and product type and the moderating impact of product involvement on emotional state in an online shopping environment. The emotional state in turn affects the impulse buying decision. Many customers make the purchase based on their emotional state to satisfy their mood, or for entertainment or self-expression. This purchase behavior that originates from the aroused emotional state is not rational from an economic perspective, but nevertheless results in the urge to buy impulsively [Verplanken & Herabadi 2001]. The propensity for impulse buying is different among individuals. We account for individuals' differences by studying the moderating effect of impulse buying tendency on the urge to buy.

2. Theoretical Development

2.1 Impulse Buying and the Urge to Buy Impulsively

Prior researchers have suggested that impulse buying is similar but not equivalent to unplanned buying since consumers may actually plan for impulse buying [Rook & Hoch 1985]. Beatty & Ferrell [1998] believe that impulse shoppers experience an urge to buy. Impulse buying can be defined as 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.

Luo [2005] and Parboteeah et al. [2009] indicated that observing actual impulsive behavior in controlled settings is problematic. When actual behaviors are monitored, consumers are not likely to behave in a natural manner. And when consumers are asked to recall an instance of impulse buying, their responses are often biased. Consumers feel the need to act or respond in a socially acceptable manner since impulse buying is often regarded as a negative behavior. This phenomenon results in a plethora of difficulties when researchers attempt to record actual impulse buying behaviors [Jones et al. 2003]. Thus, studies about impulse buying have used "the urge to buy impulsively", rather than the actual impulse buying behavior as the dependent variable [Beatty & Ferrell 1998; Parboteeah et al. 2009; Wells et al. 2011]. The urge to buy impulsively is a state of desire that is experienced upon encountering an object in the environment [Beatty & Ferrell 1998]. Our study therefore uses the urge to buy impulsively as the dependent variable.

2.2 Effects of Environmental Stimulus on Emotional State and Response

Environmental psychologists have presented the Stimulus-Organism-Response (S-O-R) paradigm, also called the Mehrabian-Russell (M-R) model, to study the effects of store atmosphere on shopping behavior [Mehrabian & Russell

1974]. According to the M-R model, environment is a major stimulus (S) to generate an emotional state in an individual (O) and, in turn, to produce an approach (i.e., the positive aspect) or avoidance behavior (R).

Prior research has investigated the impact of online storefront design on consumer emotional states and shopping behaviors using the M-R model [Floh & Madlberger 2013; Koo & Ju 2010; Mummalaneni 2005; Wu et al. 2008]. Floh & Madlberger [2013] discuss that atmospheric cues are sources of shopping enjoyment which determine the impulse buying behavior. In the atmospheric cues, they focus on the design aspects of online store including information quality, design, and navigation. Koo & Ju [2010] study the role of electronic shop atmosphere including the visual and technical design on the emotional state. They also considered the individual factor of curiosity on the purchase intention. Mummalaneni [2005] discusses the role of website design and ambience on the emotional state of the buyer. Liao & Keng [2014] also discussed the role of information quality of a website on the buying behavior. Other researchers also discussed different aspects of website design. For example, Wu et al. [2008] discuss the effect of electronic shop atmosphere including factors like color and music on the emotional state of buyer. Parboteeah et al. [2009] investigate the role of website characteristics and interface on the buyer decision. This topic is also discussed in the context of nonprofit organizations and Huang & Ku [2016] discussed the role of information quality and intention of donors' intention to donate. Also, Janita & Miranda [2013] discussed the role of information quality in the context of B2B commerce.

The majority of the prior studies have investigated the role of website design on emotional state. Only a select number of papers have focused on the role of product presentation on emotional state. One exception is Adelaar et al. [2003] who examined the effect of presentation mode (text, image and video) on emotional state. Thus while the prior studies support the validity of S-O-R model in online shops, they focus on the online store design as the major stimulus of emotional state. Furthermore, these studies consider the emotional state to be enjoyment and some consider it as a general construct and do not decompose it into its elements. In this research, we investigate the validity of S-O-R in online shops from a different and important perspective. We focus on both the product type and presentation mode as stimuli of emotion state. In addition, we incorporate two other important constructs in the research model: product involvement and individual tendency towards impulsive behavior. It has been shown in the marketing literature that product involvement has a significant effect on consumer behavior [Bian and Moutinho 2011; Dholakia 1997]. Similarly, impulse buying tendency of an individual positively influences online purchase behavior [Zhang et al. 2006; Zhang et al. 2007]. The M-R model posits that any environmental stimulus would produce an emotional state in an individual which can be characterized in terms of three dimensions: pleasure, arousal, and dominance. Pleasure refers to the degree to which the person feels good, joyful, happy, or satisfied in the situation. Arousal refers to the degree to which a person feels excited, stimulated, alert, or active in the situation. Dominance refers to the extent to which the individual feels in control of, or free to act in the situation [Donovan & Rossiter 1982; Mehrabian & Russell 1974]. The three emotional states could then mediate the approach/avoidance behaviors. In this study, we use the pleasure and arousal dimensions to measure the emotional state of consumers; the dominance dimension is not included as per the suggestion of Russell & Pratt [1980]. Dominance requires a cognitive interpretation by the person and is therefore not applicable in situations calling for affective responses.

Thus we examine the impact of online presentation mode and product type (S) on emotional state (O). Also examined is the influence of emotional state on the urge to buy impulsively (R). Furthermore, the moderating effects of product involvement and impulse buying tendency are investigated.

3. Research Model and Hypothesis Development

A model of online impulse buying based on the S-O-R paradigm is shown in Figure 1. Specific hypotheses are developed and presented below.

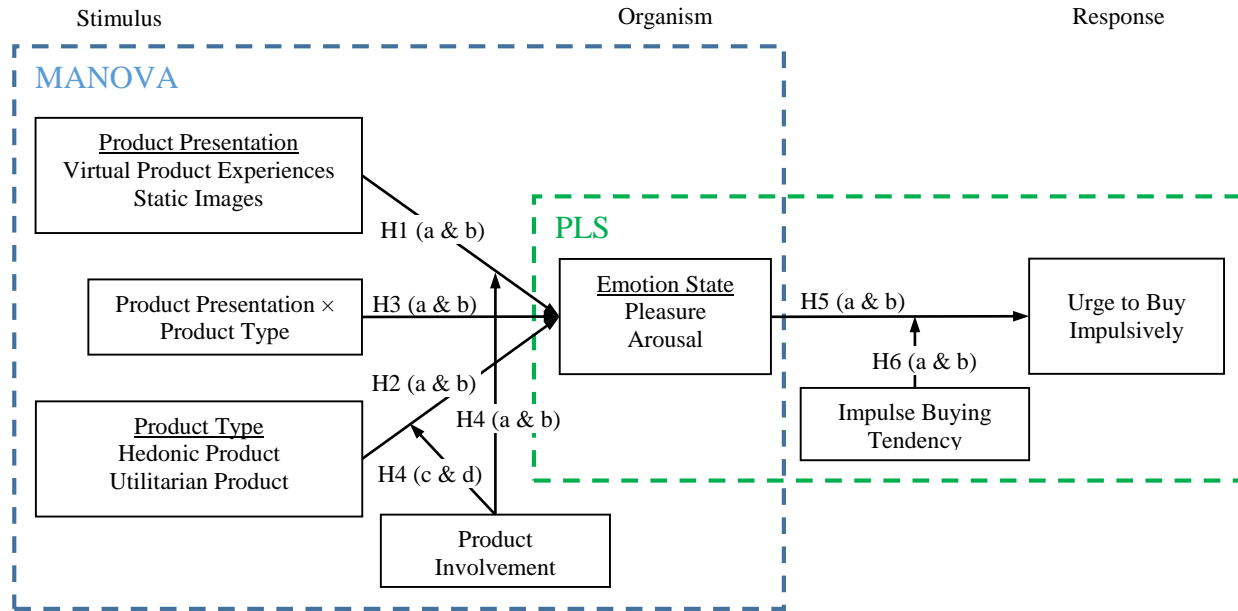


Figure 1. Research Model

3.1. The Impact of Product Presentation Modes on Emotional States

Two types of product experiences, direct and indirect, can be identified based on the degree of sensory interactions with a product. Direct experience is an unmediated interaction between a consumer and a product, wherein all personal sensory stimuli - including sight, hearing, taste and touch - can occur. Indirect experience usually takes place in the form of a representation of physical products in media such as advertising [Park et al. 2005]. Technological advances have created another type of indirect experience, called virtual product experience (VPE). VPE is a mediated experience using an online simulation or product presentation. For example, customers can visually inspect a product by enlarging, zooming, or rotating it [Jiang & Benbasat 2005].

Online product presentation can be used to help consumers form a clear understanding of the product¹. Jiang & Benbasat [2005] identify two types of VPE: visual control and functional control, which are used to emulate direct product experience. Visual control allows consumers to manipulate product images with the mouse and keyboard to view the product from different angles and distances. Functional control enables consumers to activate electronic products or react virtually according to its functional mechanisms, just as the real product does. VPE can thus provide consumers a vivid impression of the products [Jiang & Benbasat 2005]. VPE also provides more information cues and sensory stimulus which can evoke positive feelings of online consumers [Jiang & Benbasat 2007a]. Thus, compared to static images that are used predominantly in web sites, we postulate:

H1a: Product presentation in virtual product experiences leads to higher pleasure than those in static images.

H1b: Product presentation in virtual product experiences leads to higher arousal than those in static images.

3.2. The Impact of Product Type on Emotional States

Psychological studies have suggested that the product itself is one of the major factors stimulating the impulse buying decision [Dittmar et al. 1996]. Bellenger et al. [1978] indicated that certain product lines are more likely to induce impulse buying than others. Dhar & Wertenbroch [2000] found that consumers distinguish products in terms of relative hedonic or utilitarian nature. Hedonic products provide more experiential consumption and excitement, whereas utilitarian products are primarily instrumental and functional. Accordingly, our study classifies product type based on hedonic and utilitarian properties. Hedonic products, such as designer clothes, sports cars and luxury items, are products whose consumption is primarily characterized by an affective and sensory experience of aesthetic or sensual pleasure, fantasy, and fun. Utilitarian products, such as microwaves, minivans and personal computers, are products for consumption that are more cognitively driven, instrumental, and goal oriented, and accomplish functional or practical tasks [Dhar & Wertenbroch 2000].

¹ Another aspect of product presentation is product review. Product review and its different aspects are not included in this study. One possible extension to our work would be the incorporation of product reviews into the model.

Previous consumer behavior research indicates that certain types of products evoke quite different affective states than others [Strahilevitz 1999]. While utilitarian products rarely lead to sensory pleasure, hedonic products often lead to pleasure-oriented consumption. Products evoking impulse buying often have self-identity value and symbolic meaning, such as jewelry or luxury products [Dittmar et al. 1996]. A study of product trials found that hedonic products lead to stronger emotional responses, especially arousal [Kempf 1999]. Thus:

H2a: Hedonic products generate higher pleasure than utilitarian products.

H2b: Hedonic products generate higher arousal than utilitarian products.

3.3. The Interaction Effects of Product Presentation and Product Type

Psychophysical studies have posited that the change in a person's level of sense perception depends on the initial intensity of the stimulus that is acting on the sense [Kamen & Toman 1970; Monroe 1971]. It is often called the Weber's law. Phrased in another way, the same amount of change in weight would be perceived as less significant when the initial weight is high than when the initial weight is low [Lai et al. 2009]. The Weber's law has been applied to different research fields as well as to consumer behavior [Kamen & Toman 1970; Monroe 1971]. It is reasonable to expect that the same law would also apply to online consumer behavior. In particular, the impact caused by VPE may be less significant with hedonic products (providing a higher level of initial pleasure feelings) than with utilitarian products (providing a lower level of initial pleasure feelings). In other words, the impact caused by the VPE may be more significant for utilitarian product. Thus:

H3a: The superiority of VPE modes over static image modes in terms of generating pleasure is more prominent with utilitarian product.

H3b: The superiority of VPE modes over static image modes in terms of generating arousal is more prominent with utilitarian product.

3.4. The Moderating Effect of Product Involvement

Involvement refers to the perceived relevance of an object based on the inherent needs, values, and interests of a person [Zaichkowsky 1985]. Therefore, product involvement contributes in the explanation of purchase intention of individuals [Hong 2015]. Product involvement construct is widely used in the marketing literature to explain consumer behavior [Dholakia 1997]. Bian & Moutinho [2011] argue that product involvement affects the depth, complexity, and extensiveness of the process of making purchase decision. As product involvement refers to customer having interests or concerns about certain products, it results in customers spending more time to become familiar with the product and analyze the purchase decision. Consumers with high product involvement generally search product information enthusiastically while those with low product involvement do not. Therefore, the level of product involvement affects the extent of information gathering and interaction in the purchase of a product [Laurent & Kapferer 1985], and has a greater impact on the consumers' purchase decision process [Zaichkowsky 1986]. Therefore, the concept of product involvement has been used to investigate customer behavior in online shop setting in number of studies. For example, Hong [2015] studied the role of product involvement in online merchant selection & Lloyd [2014] studied the moderating effect of product involvement on impulse buying tendency in online shops.

Product involvement signifies consumers' personal interests. Thus, a high level of product involvement can lead to more intense emotional states [Bloch & Bruce 1984]. As a consequence, consumers' feelings could be affected or moderated by product involvement while browsing shopping websites. Generally speaking, any product with a high degree of involvement would generate consumers' emotions more easily with or without the use of online presentation features. On the other hand, products with low level of involvement may need to have more attractive virtual presentation features to impress consumers and evoke their emotions. Thus:

H4a: VPE generates higher pleasure compared to static image when product involvement is lower.

H4b: VPE generates higher arousal compared to static image when product involvement is lower.

By the same token and following the same line of argument, product types will have a similar effect based on level of involvement. Hedonic products generate more pleasure and engagement in general [O'Brien 2010]. Thus with lower level of involvement compared to higher level of involvement, hedonic products may be more effective in generating consumers' emotions. This is because higher level of involvement will generate more emotions irrespective of the product type. Thus:

H4c: Hedonic products generate higher pleasure compared to utilitarian products when product involvement is lower.

H4d: Hedonic products generate higher arousal compared to utilitarian products when product involvement is lower.

3.5. The Impact of Emotional States on the Urge to Buy Impulsively

The M-R model indicates that the environment is a major stimulus in generating an emotional state in an individual, and in turn, producing an approach or avoidance behavior [Mehrabian & Russell 1974]. According to M-R research, pleasure and arousal are significant mediators of planned buying behavior including time spent in store, monetary expenditures and willingness to return [Donovan & Rossiter 1982; Donovan et al. 1994]. Similarly, the

consumers' emotional states also mediate impulse buying. Other studies have indicated that a person's emotion or mood has a strong impact on impulse purchasing [Huang & Kuo 2012; Lee & Yi 2008; Rook & Gardner 1993]. Beatty & Ferrell [1998] suggested using the urge to buy impulsively as a surrogate of actual impulse buying behavior due to the difficulty in observing actual impulsive behavior. In an online context, a positive relationship has been identified between an individual's emotional state, i.e., enjoyment, and the urge to buy impulsively [Adelaar et al. 2003; Parboteeah et al. 2009]. Thus:

H5a: Pleasure of consumers positively influences the urge to buy impulsively.

H5b: Arousal of consumers positively influences the urge to buy impulsively.

3.6. The Moderating Effect of Impulse Buying Tendency

The impulse buying tendency addresses the differential proclivity of individuals to buy on impulse. Impulse buying tendency can be defined as both tendencies to experience spontaneous and sudden urge to make on-the-spot purchase, and to act on the urge with little deliberation or evaluation of consequences [Beatty & Ferrell 1998]. Consumers with highly impulsive purchase tendencies are more likely to react to spur-of-the-moment buying stimuli, and are more open to unexpected buying opportunities. Beatty & Ferrell [1998] indicated that the higher the impulse buying tendency, the more frequent the urge to buy impulsively. In an online context, impulse buying tendency also positively influences online purchase behavior [Zhang et al. 2006; Zhang et al. 2007].

Lee & Yi [2008] believed that impulse buying tendency has a moderating role on the relationship between shopping emotions and impulse buying. Consumers with high impulse buying tendency are not significantly influenced by their emotions due to already having instinctively strong impulse buying tendencies. On the contrary, consumers with low impulse buying tendencies rely on their emotions when making impulsive purchases. Thus:

H6a: The superiority of higher level of pleasure over lower level of pleasure in terms of generating the urge to buy impulsively is less prominent in individuals with higher level of buying tendency.

H6b: The superiority of higher level of arousal over lower level of arousal in terms of generating the urge to buy impulsively is less prominent in individuals with higher level of buying tendency.

4. Methodology

4.1. Pretest

Sixty four undergraduate business students from a major southern Taiwan university participated in the pretest. The purpose of the pretest was to facilitate an accurate selection of the products to be used in the experiment and to ensure that the selected products differed in terms of their hedonic and utilitarian natures. To help select products, these students answered questions about fourteen types of electronic products. The products evaluated include a printer, MP3 player, PDA, sports watch, electronic dictionary, digital photo frame, desktop computer, handheld video game, calculator, smart phone, digital camera, electronic reader, Nintendo Wii and MP3 music center. The evaluations were measured on a seven point semantic differential scale. A sample question is: "Would you characterize a digital photo frame as primarily utilitarian or hedonic on 7 point scale ranging from 1 (utilitarian) to 7 (hedonic)?" The study defined hedonic products as ones whose consumption is primarily characterized by an affective and sensory experience of sensual pleasure and fun [Hirschman & Holbrook 1982]. Utilitarian products are ones whose consumption is more cognitively driven, instrumental, and goal-oriented [Strahilevitz 1999].

Based on the above exercise, two products were selected for the experiment. A digital photo frame (mean: 5.14/7 on the above scale) and a sports watch (mean: 2.37/7) were used to represent hedonic and utilitarian products respectively. A digital photo frame provides a variety of features including photo display, and music and video playback. The product tends to offer sensory experiences and satisfies the sensual pleasure of an individual. A sports watch accomplishes a functional or practical task such as showing the time, measuring the length of time or providing an alarm clock. The product tends to be more instrumental and goal-oriented with limited aesthetic design. A t-test indicated a significant difference between the digital photo frame and sports watch in terms of product nature ($t = 11.591, p < 0.001$).

4.2. Experimental Website Design

Adobe Flash was used to implement the functional control of both the digital photo frame and sports watch. A screen shot is provided in Figure 2. In the VPE scenario, users were able to sample various functional control and visual control features in a VPE simulator using the experimental website. A user could press the buttons of the digital photo frame to set different display modes by clicking on the computer mouse. The digital photo frame reacted according to user's inputs by altering the display or playing various videos. A user could also press the buttons of the sports watch to set time, alarm, stopwatch and night-light. The sports watch reacted differently according to the users' inputs. All the functional controls simulated the reaction of the real product in a physical environment. The user could rotate, magnify, and shrink the images of the product by clicking and dragging the computer mouse. For both the digital photo frame and the sports watch, text explanations were also provided adjacent to the simulators to guide

users as they tested the various functions of the products. Functional control and visual control was not displayed on the same page of the website due to the complexity involved in manipulating the two kinds of control. Combining functional and visual control on one page may have resulted in complications and misunderstanding as users interact with the webpage.



Figure 2. The Experimental Website

In the static image scenario, static images captured from the VPE image were used to display the products in different functional modes. Multiple pictures which included front, back and side images were used to demonstrate various functions. No interactive functions were provided in this scenario. Textual explanatory descriptions corresponding to images were provided adjacent to the images. The static images and the VPEs were presented in same size to avoid potential confounding effects. Product descriptions were taken from a real shopping website and kept uniform across different scenarios. The only difference among the treatment groups was in the presentation modes.

4.3. Pilot Test

Prior to the experiment, a pilot study was conducted in order to understand the problems subjects encountered during the experiment and to improve the design of the experiment. Thirty three participants from an introductory information management class took part in the experimental process and provided suggestions to fine-tune the efficacy of the manipulations. After the completion of the pilot, the experiment was conducted.

4.4. Experimental Procedures

The proposed hypotheses were tested through a laboratory experiment with a 2×2 design, i.e. 2 types of product presentation mode (VPE and static images) \times 2 types of product (hedonic and utilitarian). A total of 120 subjects were recruited from a Southern Taiwan university campus and randomly assigned to the four treatment groups (VPEs \times product types), with 30 subjects in each group.

Before the subjects examined the experimental websites, they were shown websites that displayed other products using static images and text. The subjects were asked to treat the sample websites as benchmark against which to judge the experimental websites. Jiang & Benbasat [2005] suggested that a common benchmark be provided to all of the subjects before treatment stimuli. The use of a benchmark ensures that the subjects have similar background and experiences in browsing online shopping websites. Any differences which arise during the experiment can then be attributed to the different treatment stimuli. A research assistant trained the subjects on how to use and navigate the assigned website. After completing the experiment, the subjects were asked to fill out a questionnaire. The subjects received the equivalent of US \$4 as cash gift in Taiwanese currency for their participation.

4.5. Measurement

A multi-item scale is employed to measure the constructs of the proposed model. The measures are adopted from the existing validated studies in the literature. Respondents' emotional states' measurements were adapted from Mehrabian & Russell [1974] which is the base for measuring emotional state in literature. Donovan et al. [1994] customized Mehrabian & Russell's measurement model for store atmosphere. Wu et al. [2008] modified the Mehrabian & Russell's measurement model for online setting. Considering the online setting and store atmosphere context, we developed our measures based on the work of Donovan et al. [1994] and Wu et al. [2008]. There were five items for pleasure and five for arousal measured on a seven point semantic differential scale.

The measurement of the urge to buy impulsively was drawn from Parboteeah et al. [2009] who developed a measurement model for customer's impulsive behavior in online shops. They applied an established procedure similar to Churchill's [1979] method to develop their measurement items and achieved high internal consistency in their instrument. For measuring the impulse buying tendency, we used the items developed by Rook & Fisher [1995]. Their developed measurement items is widely adopted in literature (e.g., Jones et al. [2003] and Youn & Faber [2000]). A seven point Likert scale where 1 represented strongly disagree and 7 represented strongly agree was used for the items of these two constructs. Table 1 shows the measurement items.

Product involvement was drawn from Zaichkowsky [1994] using a seven point semantic differential scale. The items of product involvement are as follows: important-unimportant, relevant-irrelevant, means nothing-means a lot to me, worthless-valuable, involving-uninvolving, and not needed-needed. The level of product involvement was categorized in light of the subjects' self-evaluation, where the evaluation threshold for a high level of product involvement was 5 or higher on a seven point Likert scale. Sixty six subjects and fifty four subjects were categorized as having high level and low level of product involvement respectively.

Table 1: Measurement Items and Standardized Item Loadings

Wording	Loadings
Pleasure	
Contented—Melancholic	0.88
Happy—Unhappy	0.71
Pleased—Annoyed	0.91
Relaxed—Bored	0.69
Hopeful—Despairing	0.74
Arousal	
Stimulated—Relaxed	0.67
Excited—Calm	0.84
Jittery—Dull	0.80
Aroused—Unaroused	0.88
Frenzied—Sluggish	0.75
Impulse Buying Tendency	
I often buy things spontaneously.	0.86
“Just do it” describes the way I buy things.	0.90
I often buy things without thinking.	0.87
“I see it, I buy it” describes me.	0.86
“Buy now, think about it later” describes me.	0.73
Sometimes I feel like buying things on the spur-of-the moment.	0.61
Sometimes I am a bit reckless about what I buy.	0.61
Urge to Buy Impulsively	
...I had the urge to purchase items other than my specific shopping goal.	0.96
...I had a desire to buy items that did not pertain to my specific shopping goal.	0.97
...I had the inclination to purchase items outside my specific shopping goal.	0.95

5. Data Analysis

5.1. Subject Background Information

The 120 student subjects were recruited from a Southern University in Taiwan. Among the subjects, 88 (73.3%) were female and 32 (26.7%) were male. Sixteen (13.3%) were graduate students, and 104 (86.6%) were undergraduates. The average age of the subjects was 20.8. There was no significant difference in gender, age and online shopping experiences across the four interface scenarios. While our sample has more females than males, it is

fairly representative of the online users in Taiwan. Based on a report by Liang [2011], the majority of Taiwanese between 12 and 44 years old have access to internet. In another report CAN [2013], over 70% of online shoppers in Taiwan are in the 20-39 age groups.

5.2. Manipulation Checks

In the pretest, the digital photo frame and sports watch were selected to represent hedonic and utilitarian product respectively. In the experiment, subjects were asked to characterize the two product types again. The digital photo frame (mean: 4.97/7) and digital watch (mean: 1.82/7) produced significant differences in terms of product nature ($t=11.93$, $p<0.001$), consistent with the results of the pretest. Thus, the two products clearly represented hedonic and utilitarian values.

Vividness and interactivity were the two variables used to check manipulation of product presentation mode. According to Jiang & Benbasat [2007a], VPEs have higher level of vividness and interactivity than static images. There was a significant difference between VPE (mean: 5.69/7) and static image (mean: 3.73/7) in terms of interactivity ($t = 11.08$, $p < 0.001$). Also a significant difference was found between VPE (mean: 5.29/7) and static image (mean: 4.01/7) in terms of vividness ($t = 5.96$, $p < 0.001$). Thus, the experimental manipulation was valid.

5.3. Hypotheses Testing

ANOVAs were conducted on both pleasure and arousal separately. ANOVAs indicated significant effects of product presentation and product type on pleasure, thus supporting H1a and H2a (Table 2). The interaction effects between product presentation and product type on pleasure are also supported (see Figure 2 for interaction effects). The results demonstrate that for utilitarian products, a VPE interface leads to significantly higher pleasure than a static image interface, thus supporting H3a. Moreover, hedonic products displayed in a static image interface produce significantly higher pleasure than static images of utilitarian products. ANOVAs on arousal indicate no significant effects of product presentation, product type, and the interaction effects of product presentation and product type (see Table 2). Thus, H1b, H2b and H3b are not supported.

Next we examined product involvement which refers to subjects having interests or concerns about the product. Different people may have different levels of involvement due to personal relevance. The Cronbach alpha of product involvement is 0.88, well above 0.70, the generally acceptable level for adequate internal consistency. The results of Levene's test for homogeneity of variance and ANOVA indicate no significant differences between the four treatment groups in terms of product involvement. The results show no interaction effects between product presentation and product involvement on pleasure and arousal. Therefore, H4a and H4b are not supported (Table 2). However, the interaction effects between product type and product involvement on pleasure and arousal are both significant. Product involvement significantly moderates the relationships between product type and pleasure/arousal (see Figure 3 for the interactions). With high level of product involvement, no significant differences of pleasure/arousal are found between different product types. However, hedonic products with low level of product involvement can still significantly lead to high level of pleasure/arousal emotion, thus supporting H4c and H4d.

Table 2: ANOVA Summary Table for Emotion State

Pleasure	Mean Square	F	Sig.
Product Presentation	7.12	11.47	0.00
Product Type	9.74	15.69	0.00
Product Involvement	11.67	18.80	0.00
Product Presentation * Product Type	3.77	6.08	0.01
Product Presentation* Product Involvement	0.13	0.21	0.65
Product Type* Product Involvement	3.06	4.93	0.03
Product Presentation * Product Type * Product Involvement	0.12	0.19	0.67
Arousal	Mean Square	F	Sig.
Product Presentation	2.46	2.05	0.16
Product Type	3.03	2.53	0.11
Product Involvement	20.95	17.50	0.00
Product Presentation * Product Type	0.23	0.19	0.67
Product Presentation* Product Involvement	0.44	0.37	0.55
Product Type* Product Involvement	5.95	4.96	0.03
Product Presentation * Product Type * Product Involvement	2.83	2.37	0.13

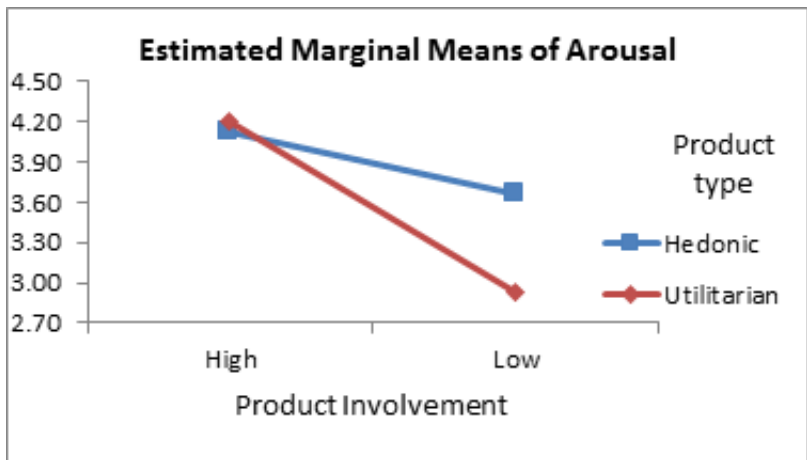
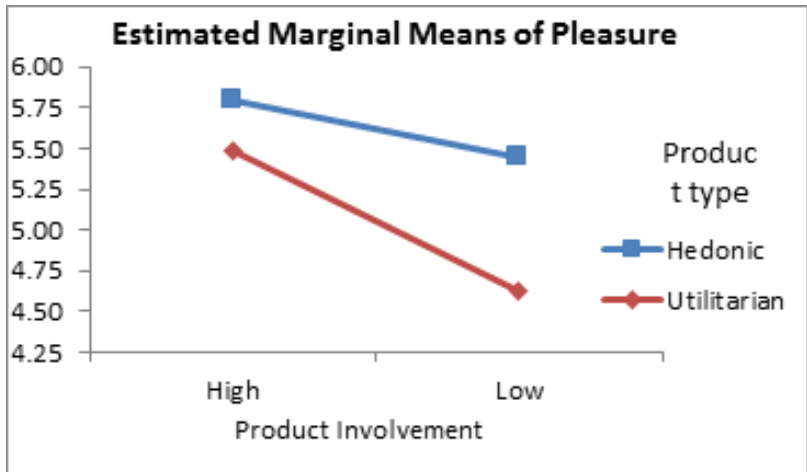
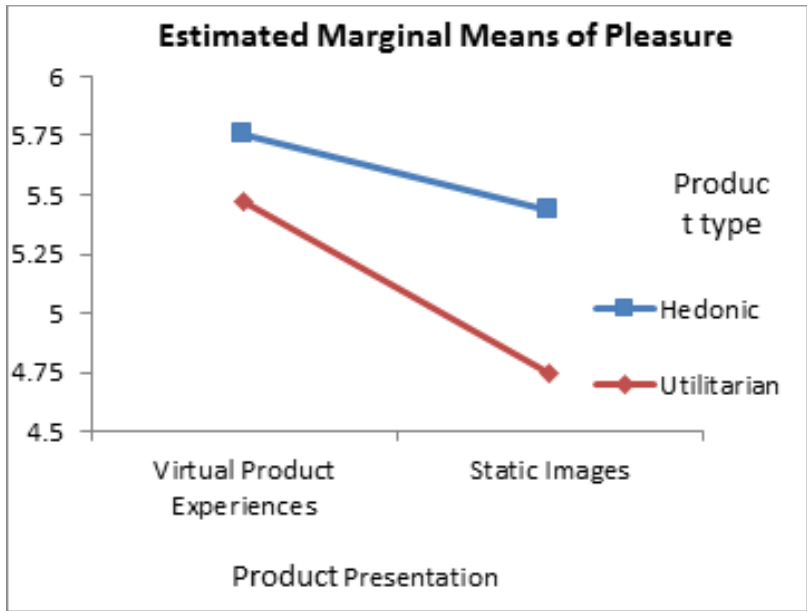


Figure 3: Interaction Effects

PLS was used to test the impact of emotional state on the urge to buy impulsively. The measurement model was assessed by examining individual item reliability, internal consistency, and discriminant validity. The measurement items generally load heavily on their respective constructs, with loadings above 0.6, demonstrating adequate reliability (See Table 1). The composite reliability and Cronbach alpha scores are above 0.8, signifying satisfactory internal consistency (See Table 3). The diagonal elements in Table 3 represent the square roots of average variance extracted (AVE) of latent variables, while the off-diagonal elements are the correlations between latent variables. The square root of the AVE of each latent variable is larger than its correlation with other latent variables, suggesting adequate discriminant validity. Also, the loadings of indicators on their respective latent variables are higher than loadings of other indicators on these latent variables, and the loadings of these indicators on other latent variables, providing further evidence of discriminant validity.

Table 3: Internal Consistency and Discriminant Validity of Constructs

	Composite Reliability	Cronbach's α	Arousal	Impulse Buying	Pleasure	Urge to Buy Impulsively
Arousal	0.89	0.85	0.79			
Impulse Buying Tendency	0.95	0.94	0.24	0.81		
Pleasure	0.89	0.85	0.55	0.12	0.79	
Urge to Buy Impulsively	0.97	0.96	0.53	0.23	0.59	0.96

Bootstrap resampling was used to examine path significance in the structural model. Results shown in Figure 4 indicate that both pleasure and arousal have significant positive effects on the urge to buy impulsively. Thus, H5a and H5b are supported. The moderating effects of impulse buying tendency on the relationship between pleasure/arousal and the urge to buy impulsively are not significant, thereby rejecting H6a and H6b. Table 4 provides a summary of results for all hypotheses presented.

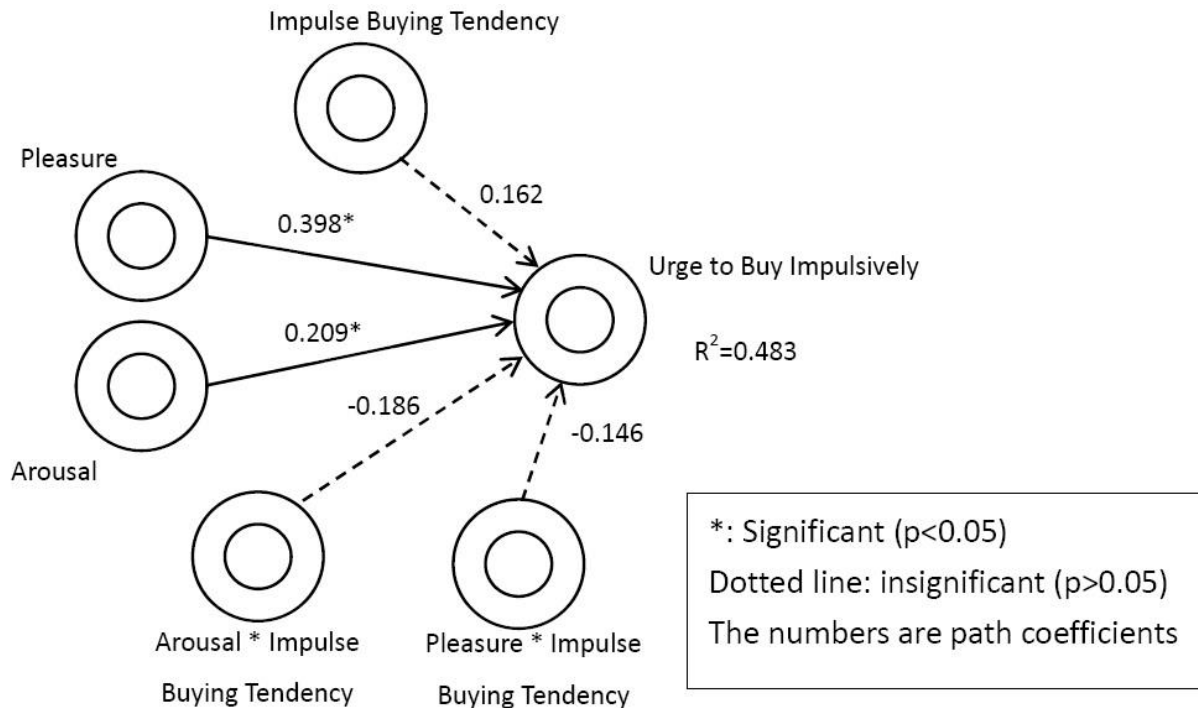


Figure 4. SmartPLS Path Analysis

Table 4: Summary of Results

Hypotheses	Support
H1a: Product presentation in virtual product experiences leads to higher pleasure than those in static images.	Supported
H1b: Product presentation in virtual product experiences leads to higher arousal than those in static images.	Disconfirmed
H2a: Hedonic products generate higher pleasure than utilitarian products.	Supported
H2b: Hedonic products generate higher arousal than utilitarian products.	Disconfirmed
H3a: The superiority of VPE modes over static image modes in terms of generating pleasure is more prominent with utilitarian product.	Supported
H3b: The superiority of VPE modes over static image modes in terms of generating arousal is more prominent with utilitarian product.	Disconfirmed
H4a: VPE generates higher pleasure compared to static image when product involvement is lower.	Disconfirmed
H4b: VPE generates higher arousal compared to static image when product involvement is lower.	Disconfirmed
H4c: Hedonic products generate higher pleasure compared to utilitarian products when level of product involvement is lower.	Supported
H4d: Hedonic products generate higher arousal compared to utilitarian products when level of product involvement is lower.	Supported
H5a: Pleasure of consumers positively influences the urge to buy impulsively.	Supported
H5b: Arousal of consumers positively influences the urge to buy impulsively.	Supported
H6a: The superiority of higher level of pleasure over lower level of pleasure in terms of generating the urge to buy impulsively is less prominent in individuals with higher level of buying tendency.	Disconfirmed
H6b: The superiority of higher level of arousal over lower level of arousal in terms of generating the urge to buy impulsively is less prominent in individuals with higher level of buying tendency.	Disconfirmed

6. Discussion and Implications

6.1. Discussion

Our study provides an enhanced understanding of how environmental stimulus can affect emotion, and in turn, influence the urge to buy impulsively in an electronic commerce setting. The results suggest that offering virtual product experiences and developing products with more hedonic elements are important environmental stimuli. Furthermore, product involvement has a moderating effect on the relationship between environmental stimulus and emotion.

Virtual product experience can significantly improve pleasure experience for utilitarian products but not for hedonic products since browsing hedonic products already brings high pleasure to consumers. The interpretation is that utilitarian products without attractive presentation modes tend to bore or irritate consumers. On the other hand, hedonic products lead to higher pleasure than utilitarian product only in the static image interface. This distinction does not apply to the VPE mode since VPE already brings high pleasure to the users. Products with hedonic elements lead to high level of pleasure with either VPE or static image modes. Thus, furnishing VPE interfaces for hedonic products may not significantly increase pleasurable feelings for the consumer. But this does not necessarily imply that VPE interfaces should not be used for hedonic products; there may be other benefits of VPE, e.g., improving product knowledge [Daugherty et al. 2008].

Product involvement has a moderating effect on the relationships between product type and the emotional states of pleasure and arousal. Compared to utilitarian products, hedonic products lead to a higher level of pleasure and arousal, even in low product involvement circumstances. Thus, adding hedonic features to products may heighten consumer emotions even if consumers have a lower level of involvement. On the other hand, if product involvement is high, consumers achieve high levels of pleasure and arousal in both utilitarian and hedonic products. Therefore, developing methods to enhance consumers' product involvement is especially important for utilitarian product merchandisers. One possibility is to include product-oriented discussions for browsers and potential consumers. Other options include providing company-hosted forums to draw like-minded individuals together. Providing consumers with easy access to third-party discussion forums is also a way to induce product involvement.

We found that product involvement does not moderate the relationship between product presentation mode and emotional states including pleasure and arousal. Regardless of the level of product involvement, the superiority of VPE modes over static image modes in terms of generating pleasure is significant, although less prominent in leading

arousal. Thus, products that add vivid or interactive presentation features may generate consumers' pleasure, but not arousal.

An interesting finding of our study is that different product presentation modes or product types do not lead to different levels of arousal. Possible explanations include the chosen presentation mode and product type. Our study focused on the manipulation of visual and functional control to represent different levels of presentation modes [Jiang & Benbasat 2005; Jiang & Benbasat 2007b]. Some researchers indicate that music (or sound control) is more likely to influence the arousal emotion [Wu et al. 2008]. In our study, no significant arousal feelings were evoked, probably due to the mild sensory stimulus provided. Future research should explore this issue by including sound control as a manipulation tool in the product presentation interface. Regarding product type, previous research indicates that games as a hedonic product would provide a high degree of sensory stimulus and thus be able to evoke an arousal response [Kempf 1999; Kempf & Smith 1998]. While the digital photo frame to represent a hedonic product was based on a pretest, it might be still a weak stimulus to generate such a response. Again, future research may investigate stronger stimuli.

Surprisingly, impulse buying tendency did not moderate the urge to buy impulsively. This result is contrary to previous research [Beatty & Ferrell 1998; Wells et al. 2011] which indicated that impulse buying tendency has a significant effect on the urge to buy impulsively. One possible explanation may be the relatively low level of impulse buying tendency (mean: 3.42/7) of the subjects, i.e., there was not much stimulation in this regard. Another reason may have to do with cultural differences. Previous studies were based in Western countries, whereas our data comes from an Eastern country. Generally, Westerners tend to be individualists while Eastern are more collectivists [Hofstede et al. 2010]. Collectivists tend to suppress their impulsive thoughts and consider the greater good. In a similar vein, Kacen & Lee [2002] found that individualists are more likely to partake in impulse buying behavior than collectivists. Future studies may investigate the relationship between cultural differences and impulse buying behavior.

6.2. Theoretical Implications

Our study contributes knowledge to electronic commerce research in several ways. First, it offers an enhanced model for online impulse buying that is based on emotional state of an individual, which in turn is based on online presentation modes, hedonic/utilitarian product type, and product involvement. Thus a deeper understanding of online impulse buying behavior is gained by examining its various antecedents. Second, the use of the S-O-R paradigm as the theoretical foundation of our research reaffirms the effects of stimulus on emotion and shopping behavior. The paradigm provides a sound basis for the inclusion of various online presentation modes and product types as online stimuli. Through the manipulation of these stimuli, the influence on the online user's emotions, and eventually on impulsive buying is examined. The experimental methodology used in the study provides higher internal validity of the results compared to survey based approaches.

Finally, the study provides theoretical and empirical support for offering different treatments of product types as well as presentation modes to support customer decision making. Several insightful results are obtained as described earlier. Based on these results, we contemplate that various web design interfaces, product design strategies and strategies for enhancing consumer product involvement may be needed based on specific contextual factors. New research questions based on these factors would need to be addressed in future investigations.

6.3. Practical Implications

As per this study, in order to increase impulsive buying, online retailers and manufacturers need to evoke consumers' pleasure and arousal emotions. Specifically, offering a high quality web design interface, including hedonic elements to products and enhancing consumer involvement are important for generating positive emotions and ultimately inducing impulse buying. Other than providing product information, online retailers should strive to enhance the product experience since an enjoyable browsing experience may increase the likelihood of the consumer purchasing a product.

Hedonic products have little problem generating consumer pleasure; however, utilitarian products are a different matter. For utilitarian products, offering VPE interface or taking steps to enhance consumers' product involvement significantly improves consumers' pleasure experience. These may include, for example, such features as dynamic animation, manipulation of product appearance or color, music, video, and novel online functions.

Another finding relevant to practitioners is that highly involved consumers tend to have higher levels of emotional feelings than lesser involved consumers, especially when browsing utilitarian products. Thus, introducing approaches to enhance user involvement for utilitarian products should be of high priority to online retailers. User involvement strategies may include: developing online promotional mechanisms such as using word-of-mouth, employing viral marketing, providing company-hosted forums, and linking users with third-party discussion forums.

6.4. Limitations and Future Research

The study's contributions to online consumer decision making and future research should be evaluated in light of a few limitations. First, as we use student samples with a higher representation of females, the generalization is

limited. Future research may use different samples in more natural settings to increase the generalizability of the results. Second, instead of actual impulse buying behavior as the dependent variable, we used “urge to buy impulsively” as a surrogate. Although it poses several challenges, future research may attempt to measure the actual behavior of impulse buying. Third, the digital photo frame and sports watch were chosen to represent hedonic and utilitarian products. While our pretest corroborated these products as hedonic and utilitarian, they may not represent the complete range of such products. Future research may evaluate a wider range of products with a variety of attributes and features. Finally, today many customers rely on reviews in their decision making. Product review could be considered as one aspect of product presentation. The product review and its different aspects are not studied in the context of S-O-R. One possible extension to our work would be the incorporation of product reviews into the model.

7. Conclusions

Based on the Stimulus-Organism-Response framework, this study developed a research model that included two factors: presentation mode and product type. Through a laboratory experiment, the impact of these factors on consumer’s emotional states (pleasure and arousal), and subsequently on impulse buying decisions was evaluated. Additionally, we also investigated the moderating effects of product involvement and impulse buying tendency. The results suggest that offering virtual product experiences and developing products with more hedonic elements are important environmental stimuli. Furthermore, product involvement has a moderating effect on the relationship between environmental stimulus and emotion. We found that hedonic products have little problem generating consumer pleasure; however, utilitarian products are a different matter. For utilitarian products, offering virtual product experiences or taking steps to enhance consumers’ product involvement significantly improves consumers’ pleasure experience. These are important results with both theoretical and practical implications.

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