EVOKING ONLINE IMPULSE BUYING BEHAVIOR THROUGH A VIRTUAL LAYOUT SCHEME

Sheng-Wei Lin
Dept. of CSIM, Soochow University, Taipei, Taiwan
swlin@csim.scu.edu.tw, +86-2-23111531 ext. 3810

Louis Yi-Shih Lo
Dept. of MIS, Central Taiwan University of Science and Technology, Taichung, Taiwan
106928@ctust.edu.tw, +886-4-22391647 ext. 7718

ABSTRACT

Drawing upon the “stimulus-organism-response” framework, this paper examines how the ease of navigation of a website affects consumers’ online impulse buying behavior. We compared the extent to which various virtual layouts (i.e., grid, freeform, racetrack, and mix grid-freeform) affected ease of navigation, emotional responses, and the impulsive urge to buy. Based on questionnaire responses from 216 college students in a laboratory experiment and using PLS for analysis, we found that ease of navigation significantly affects consumers’ emotional responses of pleasure and arousal, which then influences their impulsive urge to buy. We also found that a freeform layout has a greater effect on ease of navigation, consumers’ level of pleasure, and their impulsive urge to buy. The findings of this study provide important implications for impulse buying research and practice.

Keywords: Impulse buying, ease-of-navigation, virtual layout design, S-O-R model.

INTRODUCTION

Impulse buying is defined as a consumer’s immediate response to external stimuli. It is not limited to any specific product category, but excludes the purchase of common household items (Madhavaram & Laverie, 2004). Consumer impulse buying is an important issue in conventional retailing, where it accounts for 30 to 50 percent of all products sold (Hausman, 2000). Although consumer impulse buying behavior is well understood in conventional retailing, online impulse buying has only recently been recognized as an important phenomenon. Donthu and Garcia (1999) found that Internet shoppers are more impulsive than those in conventional retailing, as online shopping is mediated by websites that expose shoppers to strong stimuli (e.g., excellent...
visual design). This phenomenon has so far received limited attention from researchers in the information systems (IS) field (Parboteeah et al., 2009), but there is some useful research on the influence of online store design on consumers’ impulse buying behavior (Shen & Khalifa, 2012; Verhagen & Dolen, 2011).

The impulse decision has hedonic components, and may lead to actions such as brand switching, (Madhavaram & Laverie, 2004). These hedonic components can be created online by the ease of navigation in navigation flows. A website’s level of navigational ease can be examined through a set of virtual layouts. This study therefore concentrates on examining the effects on consumer impulse buying of virtual layouts with different types of website navigation. Website navigation has been shown to be a strong determinant of the purchasing intention of online consumers (Pearson et al., 2007; Melian-Alzola & Padron-Robaina, 2006), and their satisfaction with e-services (Liljander et al., 2002). Easily navigable websites can provide more hedonic benefits to consumers than those that are harder to navigate (Semeijn et al., 2005). Miao (2011) indicated that both process and situation (that is, website design) can induce positive emotions and the desire for impulsive buying, in addition to the product or service offered. The perceived ease of navigation leads the consumer to impulsive buying and is therefore an important factor for any online store, and more research in a variety of settings to validate this assertion would be of use (Manganari et al., 2011).

To address the question of how online store designs affect online impulse buying, this study uses the stimulus-organism-response model (S-O-R model) to describe the effect of different types of navigation on impulse buying behavior. The S-O-R model is a method of describing how to anticipate an individual’s primitive, emotional responses to stimuli, and therefore provides an accurate prediction of consumers’ purchase decisions (Parboteeah et al., 2009; Shen & Khalifa, 2012). We compared the extent to which each virtual layout (i.e., grid, freeform, racetrack, and mix grid-freeform) affects ease of navigation, emotional responses, and the impulsive urge to buy. This work is an extension of the study of Madhavaram and Laverie (2004), who suggest that conducting quantitative studies on different webpage configurations could improve our understanding of online impulsive buying behavior.

**Research model and hypothesis development**

Combining the findings from previous research and from the above discussion, we used the S-O-R model as the basis for our research to investigate how ease of navigation evokes different emotional responses and influences a consumer’s impulsive urge to buy (See Figure 1). Online consumers’ impulsive urge to buy was the dependent variable. Impulse buying is defined as a
sudden, unplanned, and hedonic purchase behavior under task-free circumstances. In this model, ease of navigation is an independent variable, which is measured through the manipulation of different types of virtual layout. Pleasure and arousal are two emotional responses that occur as a result of the website’s ease of navigation, and which comply with the stimulus-organism-response and are reflected in our model in the consumers’ impulsive urge to buy.

**Figure 1. Research conceptual model**

**Ease of navigation and emotional states**

Ease-of-navigation is defined as the degree to which a user can easily get the information they need from webpages. Perceived ease of navigation of a website has a positive relation to a pleasurable state and is negatively associated with arousal. Websites with good navigation result in users spending less effort in discerning the information provided. Decision makers have been identified as either “doers” or “planners” (Shefrin & Thaler, 1988). The doer is impulsive and more easily attracted by environmental stimuli; the planner has more self-control and deliberately plans their purchases (Cheema & Soman, 2006). Thus, easy navigation on a website results in a state that indicates cognitive ease, in which the individual relaxes and dilates the pupils of their eyes, as little attention is required, and little time is needed to watch and understand. A high level of ease of navigation of a website conversely diminishes the planner’s process, which in turn decreases the cognitive strain that an individual contracts the pupils and pays more attention. Less energy and attention is required in such a situation, and does not evoke arousal. We thus argue that the ease of navigation of a website is positively associated with the user’s feeling of pleasure, but negatively related to their arousal state.
Hypothesis 1. An online store that is perceived by consumers as having greater ease of navigation will induce a higher level of pleasure.

Hypothesis 2. An online store that is perceived by consumers as having greater ease of navigation will induce a lower level of arousal.

Effects of emotional response on the impulsive urge to buy

The cognitive appraisal theory of emotions is concerned with consistency between the stimulus and an individual’s motives. When the stimulus satisfies individuals’ motivation, they experience positive emotions; however, if the stimulus is seen as obstructive, they experience negative emotions. Therefore, emotional valence is defined as the feeling of pleasure/displeasure toward a stimulus that is a result of motivational consistency/inconsistency appraisal. We consider the ease of navigation of a website as emotion-eliciting stimuli. The S-O-R model suggests that emotions provide individuals with the ability to respond to changes in their surroundings by triggering approach or avoidance behavior. Emotional valence is a significant predictor of approach-avoidance behavior. Positive emotion (e.g., pleasure) drives the tendency to approach; negative emotion (e.g., displeasure) promotes avoidance in a variety of environments, including online stores (Bagozzi et al., 1999; Frijda et al., 1989).

The discrepancy between the present and the desired leads to discomfort, and in turn leads to arousal and to impulsive action to reduce the discomfort (Frijda, 2010). The intensity of corresponding impulsive action is associated with the level of arousal (Mattila & Wirtz, 2001). Therefore, arousal is a significant predictor of an individual's responses to an environment. High arousal stimulates the approach tendency (e.g., spending more money and more time in the store); low arousal encourages avoidance behavior (Sherman et al., 1997). In this study, impulse buying is an approach behavior. The foregoing analysis leads us to propose Hypotheses 3 and 4.

Hypothesis 3. The sense of a pleasant experience has a positive effect on the impulsive urge to buy.

Hypothesis 4. The feeling of an arousal experience has a positive effect on the impulsive urge to buy.
RESEARCH METHOD

To test the proposed model, we conducted a laboratory experiment. We manipulated the website stimuli by varying four types of virtual layout and measured how the subjects perceived the ease of navigation, their emotional responses, and the resulting impulsive urges to buy.

Experiment procedure

At the beginning of the experiment, the subjects were instructed to read a hypothetical scenario designed to simulate an enjoyable experience, that is, to experience Web-browsing activities without any explicit goals (Deng & Poole, 2010). This simulated experience ensured that the resulting arousal and the pleasantness of the experience positively affected impulse buying. The scenario was adapted from Deng and Poole’s study, which described a fictional situation in which the subjects visited a seafood website for enjoyment and fun. We further evaluated the effectiveness of the scenario in eliciting the intended states of enjoyment. We eliminated invalid subjects from our sample. To enable the subjects to make purchases and increase the impulse buying possibilities, we offered ten-dollar online coupons for immediate shopping. If the subjects had the impulse to buy, they could use the coupon. Therefore the subjects who used the coupons could be considered impulsive buyers.

The subjects were each randomly assigned to one of the four website versions to reduce the possibility that differences in the subjects would influence the results. The individuals were compared using several variables, including product knowledge, web knowledge, and impulsiveness. The results of a one-way ANOVA indicated no significant differences in product knowledge (F=0.82, p > 0.1), web knowledge (F=0.88, p > 0.1), or impulsiveness (F=1.07, p > 0.1), implying that there were no individual differences across the different treatments.

After exposure to the webpage, the subjects were asked whether they would like to add products to the e-shopping cart. If they intended to buy, they were able to order; if they did not, they were able to press a “go away” button, and leave the experiment. Subjects who decided to purchase were asked to answer a questionnaire regarding the perceived ease of navigation of the website, their emotional responses, and any urge to buy impulsively. The subject’s impulsiveness, product knowledge, and web knowledge were captured as control variables to control their influence on impulse buying.
Virtual layout design

This study designed four types of webpage based on the four layout types identified by Vrechopoulos et al. (2004): grid, freeform, racetrack, and mix grid-freeform. These virtual layouts are discussed in the following sections.

(1) Grid: The objective of the grid layout is to help consumers find their desired products as efficiently as possible, and Vrechopoulos et al. (2004) argue that a conventional grid layout corresponds to a hierarchical structure (i.e., product category -> product subcategory -> end-product) in online stores.

(2) Freeform: The objective of the freeform layout is to provide consumers freedom to move in any direction. To enable this, online stores should provide a search engine and selected items should appear on each page, with direct access to all products from the homepage (Stenstrom et al., 2008).

(3) Racetrack: The racetrack layout is where the entire store is arranged into individual and semi-separated areas, and each area is concerned with a particular shopping theme. The objective of the racetrack layout is to force consumers to follow predetermined paths to reach desired products. Vrechopoulos et al. (2004) argue that the racetrack’s tunnel-like structure can be achieved in online stores by providing limited selections for consumers on the homepage before they continue their exploration.

(4) Mixed Grid-Freeform: The “mixed grid-freeform” layout combines grid and freeform, and possesses the advantages of both layouts while avoiding their disadvantages.

Subjects

The sample consisted of 216 college students who participated voluntarily and who had Internet shopping experience. Each received a gift certificate for his or her participation. The sample consisted of 110 females (51 percent) and 106 males (49 percent). The majority was between 20 and 21 years old, 94 percent (204) spent one to three hours daily online, and 87 percent (187) had one to three years’ experience of online shopping.

Measurement

Ease of navigation. We used five items adopted from Semeijn et al. (2005) to measure perceived ease of navigation.
Emotional responses. The emotional responses (feelings of arousal and pleasure), were measured using semantic differentials (scales: -3~ +3). We used three items adopted from Deng and Poole (2010) to measure an individual’s feelings of arousal and pleasure.

Dependent variable

Urge to buy impulsively. Three items identified by Parboteeah, Valacich, and Wells (2009) were used to measure the subjects’ urge to buy impulsively.

Control variables. Past research has shown that consumers’ impulsiveness positively influences their impulse buying (e.g., Wells et al., 2011). Four items adopted from Rook and Fisher (1995) were used to measure buying impulsiveness. Product knowledge has been seen to influence consumers’ information processing regarding product categories. Based on TAM theory, an individual’s technological skills affect the ease of navigation that they perceive depending on the specific technology used. Therefore, four items adopted from Smith and Park (1992) to measure product knowledge and four items from Venkatesh and Davis (1996) to measure Web knowledge were included.

RESULTS

The construct reliability of the measures was evaluated using Cronbach’s alpha. The Cronbach’s alpha of each construct measure was as follows: perceived ease of navigation = 0.93; pleasure = 0.82; arousal = 0.82; urge to buy impulsively = 0.91; impulsiveness = 0.90; product knowledge = 0.73; Web knowledge = 0.81. All values were above 0.7, and exceeded the threshold values.

Analysis of the structural model

The partial least squares (PLS) analysis was performed using SmartPLS 2.0 software to validate the structural model. After including the control variables, the results showed a good explanatory variance for the urge to buy impulsively (R2 = 40 percent), as well as for the emotional states (i.e., pleasure, R2 = 35 percent; and arousal, R2 = 18 percent) resulting from the perceived ease of navigation.

Ease of navigation had a significant effect on the level of pleasure, thus validating H1. Contrary to our expectation, perceived ease of navigation positively influenced arousal states, thus failing to support H2. The regression coefficients were 0.59 (p<.001) for perceived ease of navigation regarding pleasure, and 0.38 (p<.001) for perceived ease of navigation regarding arousal.
Pleasure ($\beta = .53, p < .001$) was a significant determinant of the urge to buy impulsively, demonstrating that an emotional state of pleasure during online navigation has a strong influence on a consumer’s impulsive urge to buy, which supports H3. In addition, arousal ($\beta = .16, p < .05$) was positively related to a consumer’s impulsive urge to buy, thus supporting H4.

**Analysis of the effects of the alternative virtual layouts**

One-way between groups ANOVA tests with Scheffe post-hoc comparisons were used to examine the alternative virtual layout pattern effects.

Ease of navigation: Online stores using the freeform layout achieved greater levels of ease of navigation than the other three layouts ($F= 8.95, p < .001$). In addition, there were significant differences between the freeform layout and the other three layouts, whereas there were no significant differences between the grid, racetrack, and mixed grid-freeform layouts.

Pleasure: The freeform layout gave rise to greater levels of pleasure than the other three layouts ($F= 7.74, p < .001$). There were significant differences between the freeform layout and the other three layouts, but no significant differences between the grid, racetrack, and mixed grid-freeform layouts.

Arousal: The results showed that there were no significant differences in arousal between the four virtual layouts ($F=.54, p > .1$).

Urge to buy impulsively: The freeform layout lead to greater levels of the impulsive urge to buy than the other three layouts ($F= 5.73, p < .001$). In addition, there were significant differences between the freeform and the other three layouts but no significant differences between the grid, racetrack, and mixed grid-freeform layouts.

**CONCLUSION**

Based on the S-O-R model, this study examined online impulse buying as triggered by ease of navigation. The results confirm that consumers’ emotional states (i.e., pleasure and arousal) induced by their perceived ease of navigation affect their subsequent online impulse buying. The main findings of this study can be summarized as follows.

First, consistent with the findings of previous research (Kang & Kim, 2006), the results of this study indicate that ease of navigation may have a positive effect on consumers’ levels of pleasure, but contrary to our expectation has a positive relationship with their arousal levels, which
confirms the findings of Porat and Tractinsky (2012) that the correlation between usability (ease of navigation) and arousal is significant ($r = .31, p < .001$). A possible explanation may be that high arousal result from joy components of the environmental stimuli (Groeppel-Klein, 2005, p. 436), particularly when the individual has no specific shopping goal (Wang et al., 2011).

Second, the results confirm the ongoing effects of the emotional responses evoked by ease of navigation. In line with reversal theory, when consumers are playful, sensation-oriented, and spontaneous (e.g., the impulse buying context), arousal states have a positive relationship with their impulsive urges to buy. Congruent with their arousal states, a feeling of pleasure has a positive effect on a consumer’s impulsive urge to buy (Shen & Khalifa, 2012).

Third, with regard to the effects of the four layout patterns (grid, freeform, racetrack, and mixed grid-freeform), the findings show that the freeform pattern had a better discriminant effect than the other three layouts. For example, consumers perceived greater ease of navigation, higher levels of pleasure, and had more impulsive urges to buy when in the freeform layout, compared to the other three layouts. Vrechopoulos et al. (2004) found that the freeform layout was significantly more entertaining and engaging, and encouraged consumers to stay on the particular website longer. The nature of impulse buying is entertainment-oriented and associated with hedonic consumption, and, consistent with Vrechopoulos’s argument, our findings show that the freeform layout evoked higher levels of pleasure in consumers and an increased urge to impulse buy.

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