AN EVALUATION OF VIRTUAL AND PHYSICAL SHOPPING PROCESS ON CONSUMER PRICE SENSITIVITY: INNOVATIVENESS AS A MODERATOR

Kit Hong Wong*, National Cheng Kung University, Taiwan
r4897701@mail.ncku.edu.tw, *corresponding author

Dr. H.H. Chang, National Cheng Kung University, Taiwan
easyhhc@mail.ncku.edu.tw

Chin-Ho Lee, National Cheng Kung University, Taiwan

Wan-Chen Lin, National Cheng Kung University, Taiwan
juice_caca23@yahoo.com.tw

ABSTRACT

The popularity of the Internet facilitate virtual shopping as one convenience shopping choice for consumers. However, consumers would have different evaluation viewpoints on both shopping processes in term of emotions and shopping value. This study designed two scenarios (an virtual shopping website and a trial physical product) and adopted Consciousness-Emotions-Value (CEV) model to examine the effect of consumer emotion and shopping value on price sensitivity. Consumer innovativeness was proposed to have moderating effect on shopping process. Both online- and paper-based questionnaires were used for the field survey and 403 valid questionnaires have collected. The findings revealed that website quality and product usability have a positive effect on consumer emotions; a positive emotion also resulted in higher hedonic and utilitarian value. However, hedonic value had a negative influence on price sensitivity. This indicates that consumers perceiving a higher hedonic value in the shopping process will have a higher willingness to pay more. In managerial implication we suggested what the manufacturer should look into the product design such as to have more friendly and usable functions. For retailer, they should well trained their sales person to serve customer more professionally. Lastly for internet store, they should have a full information to enhance the confidence and trustfulness of the website. 3D panoramic photo should also included to attract consumer attention during the shopping process.

Keywords: Price Sensitivity, Innovativeness, Website Quality, Product Usability

INTRODUCTION

The online shopping market has grown rapidly for the last two decades. According to the Market Intelligence and Consulting Institute (MIC, 2009), almost 90% of the population have experience in shopping online, and the sales have increased 30% in that period. Taiwan online market has a large variety of product choices, including clothes (the largest market), beauty care (second) and consumer electronics product (third). Although online market offers more opportunities for interactive and personalized marketing compared to the
physical market environment. However, consumers are unable to touch and try out the physical products directly in the online environment. Due to insufficient of physical product knowledge, online purchases may be affected by information shortage, perceived risk of trade, perceived price of products, and may, as a result, ultimately affect their willingness of purchasing.

Alba et al. (1997) pointed out that online consumers are able to obtain more information about both price and non-price attributes, and ultimately increase consumer price sensitivity especially when they can obtain more information on price. However, if the quality of the product website is low (such as lacking in information and of poor design, among other faults), price sensitivity may not be affected in the shopping process. That revealed not only products information is important, but website quality may also a driver of consumer price sensitivity. Consumers will have higher price sensitivity when they obtain more information.

Several researches have adopted Consciousness-Emotion-Value (C-E-V) model (Holbrook, 1986) to study the similar area of online or physical shipping environment (Eroglu, Machleit and Davis, 2003; Fiore, Jin, and Kim, 2005). However, there are some areas remained unexplored. Firstly, the “consciousness” is always focused on either website atmosphere, image interactivity features or website social cues when it comes to online shopping (Eroglu et al., 2003; Fiore et al., 2005). And secondly, prior research on product price have mostly focused on online or physical shopping separately, and the product categories include grocery items (Wakefield and Inman, 2003), clothing (Ramirez and Goldsmith, 2009) and digital cameras (Grewal, Munger, Iyer and Levy, 2003).

This study adopted two consciousnesses (website quality and product usability) to examine consumer response toward a high-tech product when they involved in online and physical shopping which remained unexplored in the prior research. By doing so, the study designed two situations - online shopping and physical shopping with a trail physical product to examine consumer price sensitivity in both environments. It is very important to understand the concerns of consumer behavior from different viewpoints that what the elements are to influence their price sensitivity during the shopping process.

In addition, the study proposed consumer characteristic (e.g., innovativeness) have moderating effect on the online shipping process. High innovative or low innovative consumers would have different behavior in searching and accepting of product information or even have different attitude towards purchasing a high-tech product. As high-tech products (e.g., digital camera) were used as research object, therefore, we try to adopt consumer innovativeness as moderator to examine its moderating effect on the relationship between consciousness and emotions when consumers shop in either an online or physical retail environment.

Digital cameras are one of the top ten products that people buy online (MIC, 2009). Consumers can easily purchase a digital camera from the online shopping websites such as Yahoo and PChome, as well as brick-and-mortar stores such as Carrefour or other electronic stores. Besides, digital camera is one of the most common and popular products in consumer electronic market, almost every consumer own one on hand in average (E-ICP
database, 2008). It has many configurations and designs that include exterior (e.g., color, weight, and shape) and interior (interface performance and ease of use). All these product designs will expect to affect product usability of the user, even the behavioral response. In addition, heavy Internet users are found to be younger, higher educated, and higher income (Porter and Donthu, 2006), which is similar to the characteristics of frequent purchasers of high-tech products (Meuter, Bitner, Ostrom and Brown, 2005).

Based on above discussions, the study conducted two studies to complement the research gaps. Study one established a virtual shopping environment (a website), and provided different level of product information except price for consumers to browse through. Study two provided a physical product (a digital camera) for consumers to try on. The study compared consumer price sensitivity for both online and physical situations by applying CEV model. The constructs included website quality, product usability, consumer characteristics (i.e., innovativeness), emotion (i.e., pleasure, arousal, and dominance), and value (i.e., hedonic and utilitarian) to examine different level of price sensitivity in both online and physical situations. The main objectives of the study are: (1) to propose a research model by using two antecedents (website quality and product usability) to examine their effect on price sensitivity through the path of emotions and shopping value. (2) to test whether consumer innovativeness has a moderating effect on the relationship between website quality, product usability and emotions. And (3) to compare consumer price sensitivity levels between online and physical situations.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Consciousness–Emotion–Value (C–E–V) model

The Consciousness–Emotion–Value (C–E–V) model of the consumption experience is dynamic (Holbrook, 1986), with feedback loops between each component. The first component, consciousness, includes cognitions or beliefs about consumer products as well as mental events such as fantasies or imagery during the consumption experience. The second component, emotion expands beyond that affect (such as a favorable disposition toward shopping or enjoyment) including subjective feeling states, such as pleasure and excitement. The last component, value indicates what the consumer perceives as gains from the consumption experience. This includes hedonic value and aesthetic pleasure from sensory elements during consumption.

The shopping value (hedonic value and utilitarian value) is an issue of influencing consumer shopping behavior. In between product price is also the key to determine whether to purchase from online or brick-and-mortar stores especially high-tech products are always considered as higher price level products. Therefore, this study especially brings price sensitivity into the C-E-V model as a dependant variable and examines consumer price sensitivity in the shopping process with regard to high-tech products. Besides, personal characteristic such as innovativeness could be an element of influencing consumer decision making of purchasing high-tech products. As high innovative consumers are more likely to purchase high-tech products (Meuter et al., 2005); therefore, innovativeness was included in the C-E-V model as a moderator between the relationship of consciousness and emotions.
In line with a C–E–V approach, this study is designed to test the relationship between consciousness (website quality and product usability), emotion, value (shopping value) and personal characteristic (innovativeness) to examine whether different consumers who shop on the Internet or in brick-and-mortar stores can be stimulated by website quality and product usability consequently will have different emotions and shopping value that affect their product price sensitivity.

**Consciousness - Website Quality**

Research on website quality can be classified into two different research streams. The first stream is identifying the attributes that contribute to website quality and has resulted in the development and testing of instruments to measure website quality. The dimensions are including website appearance, content or information, and the quality of online technical websites, including such attributes as response time or interaction (Aladwani and Palvia, 2002). His results revealed that web quality could be measured by web appearance, web content (divided into special content, and content quality), and technical adequacy. **Web appearance** refers to website organization, proper use of fonts, proper use of colors, proper use of graphics, and graphics-text balance, among others. **Web content** includes special content that consumer can find contact detail about product information as well as consumer policy; and content quality refers to overall information about the product, such as its usefulness, completeness, and configuration, and etc.. **Technical adequacy** refers to security, availability, reliability, personalization or customization, interactivity, and ease of access, and etc..

The second stream is an examination of the website quality effect on consumer perceptions and intentions, which is not the focusing area of this study. Accordingly, this study adopts the four dimensions that stated by Aladwani and Palvia (2002) and defines it as users’ evaluations of website features meeting their needs and reflects four degrees: web appearance, special content, content quality and technological adequacy of a website when they searching a high-tech product.

**Consciousness - Product Usability**

Consumer electronic products such as mobile phone, digital camera, and etc. have integrated various technologies into different areas such as video, audio, computer software and hardware. However, multifunctional product doesn’t mean it has higher level of usefulness or usability. It can be more complicated and hard to use. This trend makes the usability become one of the most important design issues. Based on the concept of human-computer interaction (HCI), usability was originally defined as the degree of ease of use (by subjective assessment) and effectiveness of use (by objective performance) within the specified range of users, tasks, tools, and environment (Shackel, 1984).

Han, Yun, Kwahk, and Hong (2001) define product usability more specifically as the degree of satisfying the users in terms of both the performance and the image and the impressions felt. There are two dimensions have been proposed: performance, and image/impression. Performance can be classified into three categories: **perception/cognition** consists of examining how well the users perceive and interpret the interface of a product;
learning/memorization explains how fast the users get used to the product and how well they remember its functions; and control/action represents the users' control activity and its results. Image/impression also can be classified into three categories: basic sense includes the primitive image and impressions stemming from the product; description of image explains the image and impressions of a product that users will describe based on their experience; and evaluative feeling/attitude explains the attitude or judgmental feelings as a whole about the product.

Accordingly, the study defines product usability as the satisfaction level of high-tech product users with regard to both the performance and the image/impressions they feel. This study expects that these two factors will affect consumer emotions during the shopping process.

**Emotions - Pleasure, Arousal, and Dominance**

Consumer emotional contribution is an essential element for decision making when doing shopping (Zaltman, 2003). Emotion can be considered as a mental readiness that arises from appraisals of events or of one’s thoughts (Bagozzi, Gopinath and Nyer, 1999). According to the environmental psychologist Mehrabian and Russell (1974), all emotional responses to physical and social environments can be captured with three dimensions: pleasure, arousal, and dominance (PAD). These three dimensions can adequately represent all of the diverse human emotional reactions to environment and measure one’s feelings that, in turn, influence behavior.

**Pleasure** refers to the degree to which a person experiences an enjoyable reaction to some stimulus in the shopping environment; it consists of happiness, enjoyment, and satisfaction. Pleasure is found to have positive relationship with consumer behavior as they will spend extra time on shopping and consumption as well as on satisfaction (Liu and Arnett, 2002). **Arousal** is defined as a combination of mental alertness and physical activity which one feels stimulated, excited, or alert in the shopping environment. More specifically, arousal demonstrated to increase shoppers’ intentions to remain and to spend money in conventional retail environments (Foxall and Greenley, 1998). **Dominance** refers to the extent to which the individual feels restricted/unrestricted or in controlled or uncontrolled the shopping environment. Virtual online shopping environments are more technically complicated and information-intensive than traditional ones. It influences the extent to which online users perceive themselves to be able to dominate their interaction with the environments they encounter. Dominance specified in the environmental psychology model, has been also found to have significant impact on users’ behavioral decision.

**Shopping Value - Hedonic Value and Utilitarian Value**

Shopping value is an evaluation subject after one has interaction experience with the activities, and it is a key outcome in a general model of consumption experiences (Babin, Darden and Griffin, 1994). Perceived value is defined as the consumer assessment of what is received relative to that which is given (Zeithaml, 1988), and it is recognized as an important marketing construct due to its relationship with quality, customer satisfaction and loyalty (McDougall and Levesque, 2000). As a starting point, consumer behavior researchers
recognize two pervading, dichotomous motivations for shopping: hedonic and utilitarian (Hirschman and Holbrook, 1982).

Hedonic value is an outcome related to spontaneous responses that are more subjective and personal (Babin et al., 1994). Hedonic values, such as entertainment, exploration, and self-expression (Ailawadi, Neslin and Gedenk, 2001), derive more from fun and enjoyment than from task completion and are non-instrumental, experiential, and affective (Chaudhuri and Holbrook, 2001). Utilitarian value results from the conscious pursuit of an intended consequence (Babin et al., 1994). It is primarily instrumental, functional, and cognitive and represents customer value as the means to an end (Chandon et al., 2000).

In the consumer shopping process, the hedonic motive relates to experiential shopping where the fun, entertainment and escapism of the shopping process may be paramount for acquiring products. Consumers often shop for an appreciation of the experience rather than simply for task completion (Childers, Carr, Peck and Carson, 2001). In contrast, the utilitarian motive underscores task-specific, rational and deliberate product acquisitions where shopping is perceived to be work or a necessity (Babin et al., 1994) and the task-specific use of shopping, such as purchase deliberation (considering the product, service, and price features before actual purchase) (Hoffman and Novak, 1996). Though usually prompted by one overriding motive, a shopping incident may provide both utilitarian and hedonic value (Babin et al., 1994).

This study examines consumer’s shopping value in the high-tech product shopping process for both internet and brick-and-mortar stores. We define hedonic value as consumer experience fun, entertainment and escapism of the shopping process. As the study are not focusing on the price feature, we therefore define it as task completion, convenience and deliberate product acquisitions, except price, where shopping is perceived to be work or a necessity.

Innovativeness as a Moderator

Rogers (1995) defined innovativeness as the early adopter of new technology. Cotte, and Wood (2004) defined innovativeness as the willingness of embrace change, try, and buy new products more often and quickly than others. Personal innovativeness in some individuals means that they are willing to take risks. In innovation diffusion research, highly innovative individuals are showed to be active seekers of new ideas. They are able to cope with high levels of uncertainty and develop more positive intentions to accept. (Lu, Liu, Yu and Wang, 2008).

An alternate concept of innovativeness that proposed by Goldsmith and Hofacker (1991) as domain specific innovativeness (DSI). It has been found to have associated with wide range of innovation adoption. DSI aims to explicate the narrow facets of human behavior within a person’s special interest domain (Midgley and Dowling, 1993). It captures the individual’s predisposition toward the product class, and refers to the tendency to acquire new products or related information within a specific domain (Goldsmith and Hofacker, 1991). Of pertinence here, Goldsmith (2001), and Blake, Neuendorf and Valdiserri (2003) applied the DSI measure to online shopping. In this study, we defined innovativeness as the relative
willingness of a person to search, try or buy a new high-tech product regardless of the virtual or physical shopping environment.

High-tech products have higher uncertainty and complexity; consumers will need to put more effort and time to familiarize with it. When consumers venture into the adoption of new products, they face a dilemma between desirable and undesirable consequences of the product adoption and hence face a risky decision (Hirunyawipada and Paswan, 2006). Although several studies (Conchar, Zinkhan, Peters and Olavarrieta, 2004) have suggested that perceived risk may have negative influence against the decision to adopt new products, actual adoption is a function of consumer receptivity toward the specific product, and the perception of risk may not have much to do with actual adoption. However, it may lead to consumers seeking more information in order to ascertain the level of risk, mitigate the perception of risk, or manage the perceived risk (Hirunyawipada and Paswan, 2006). Therefore, consumer innovativeness serves an important role in the adoption of a high-tech product and determines whether they will accept the risks involved, even if this affects the consumer value toward the product.

**Price Sensitivity**

Price sensitive consumers seek low prices and are less likely to buy when prices rise. Contrary, less price sensitive consumers are willing to pay higher prices for the same goods than are price sensitive consumers and are more willing to buy if prices go up (Foxall and James, 2003). The definition of price sensitivity basically can be classified into two different categories. Firstly, Wakefield and Inman (2003) defined price sensitivity as individuals perceive and respond to the changes or differences in prices for products or services. And secondly, referring to the weight attached to price in a consumer valuation of a product’s overall attractiveness or utility (Erdem et al., 2002). This study focuses on the effects of price sensitivity and does not examine the price changes. Therefore, we define it as the weight attached to price in a consumer valuation of a high-tech product’s overall attractiveness or utility in the shopping process, which is similar to the second definition.

Price sensitivity is one of the behavioral intention factors that affect consumers’ behavior. Not many studies have specialized in research on the effect of price sensitivity, linking consumer characteristics or shopping environments, especially in online websites, together with price sensitivity. Degeratu, Rangaswamy and Wu (2000) found that consumers who shop online have more price sensitivity than they do in physical environments and will compare prices carefully on websites. Digital camera is one of the high-tech products that upgrade rapidly. Consumers may need more information to compare each version, including the product configurations as well as prices. But not all online consumers are willing to purchase it online as they haven’t seen the physical product and have no chance to try it. The study intends to examine the website factors (the website quality) and the physical product factors (the product usability) that may influence consumer price sensitivity while they are shopping online or brick-and-mortar stores.
Website Quality, Product Usability and Emotions

The first stimulus variable: website quality. Mehrabian and Russell (1974) classical affect model has supported the notion that stimuli in the physical environment influence people’s emotions (such as arousal and pleasure responses) in brick-and-mortar stores (Baker, Levy and Grewal, 1992), as well as internet stores (Eroglu et al., 2003). Although in many instances, the dominance dimension is not included, probably due to Russell’s (1979) recommendation that pleasure and arousal alone can adequately represent the range of emotions exhibited in response to environmental stimuli. In the online retail context, it is possible that shoppers choose online rather than traditional retail outlets for the increased control over the shopping situation. Conversely, online shoppers may feel a decreased level of dominance in situations where download times are slow, when there is no way to contact the retailer for more information, when the site is difficult to navigate, or when links are missing or inactive.

Recently, research has cited many examples showing the relationship of website quality to emotions. For instance, Fiore et al. (2005) found the image interactivity feature of shopping websites to be a stimulating experience that was positively associated with the level of emotional arousal and pleasure. Ethier et al., (2006) showed that website quality had a positive impact on the cognitive appraisal of a situational state, which in turn influenced emotions experienced by consumers while shopping online. When consumers have a more positive evaluation of an online shopping experience, they experience a higher level of the intensity of emotions such as enjoyment, joy and pride. However, the more negative the evaluation, the higher the intensity of dislike and frustration. Hence, the first hypothesis is proposed:

**Hypothesis 1:** Website quality can positively affect the emotions (pleasure, arousal, and dominance) of high-tech product shoppers.

Another stimulus variable is product usability. Depending on the level of expectancy confirmation or disconfirmation on important benefit dimensions, a product may evoke positive, negative, or a mixed set of emotions (Bagozzi et al., 1999; Chaudhuri, 2006). Many researches emphasize the effects of product performance and design (i.e., product form, product appearance, product usability) on consumer response. Such as, Bloch (1995) pointed out that product design can affect consumer cognitive and affective responses, include positive and negative aesthetic responses. Besides, Garber (1995), and Crilly, Moultrie and Clarkson (2004) argued that product appearance, product categorization, product form (e.g., colors, texture, materials), and visual perceptions can affect consumer cognitive and affective responses effectively.

In more recently, the Pre-purchase Affect Model (PAM) (Seva, Duh and Helander, 2007), a conceptual model of product emotion that includes product attributes, purchase criteria, pre-purchase affect and purchase intention was proposed. This model connects product attribute with pre-purchase and accepts the positive relationship caused by purchase criteria as the moderator. Seva et al. (2007) suggested that the product attributes of a mobile phone positively affect pre-purchase emotions. For example, the width of the phone’s body significantly affected feelings of contentment and encouragement to buy. This
study expects product usability (performance and image/impressions) would have positive effect on consumer emotions (pleasure, arousal, dominance) toward the physical shopping process. Hence, the second hypothesis is proposed:

**Hypothesis 2:** Product usability can positively affect the emotions (Arousal, pleasure and dominance) of high-tech product shoppers.

**Moderating Effect – Innovativeness**

Rogers (1995) noted that people are more innovative when they feel comfortable with technology. When consumers feel anxiety, fear, and apprehension in using technology tools, they will avoid to change, buy, and use a new one (Meuter et al., 2005). These consumers therefore possessed a negative attitude towards technological products. Researchers have noted that adoption of online shopping methods is a functional behavior not only of attitudes, needs, and experiences, but also of personal characteristics such as innovativeness (Robinson, 2005). More specifically, consumers who have higher innovativeness are more likely to seek multiple sources of information and new experiences that stimulate their senses as they form their perceptions toward a technology (Agarwal and Prasad, 1998).

This study proposes that innovativeness will have moderating effect on the relationship between consumer perception regarding shopping website quality, product usability, and emotions. Therefore we infer that high innovative consumers are easy to fall into the enjoyment of high-tech product shopping environment (such as surfing on the high-tech product website). Besides, we also believe that when the consumers once use the new product, they will be more likely trying it. That will result in the consumer perceiving the stimulus and experiencing a higher degree of emotions than the consumers with low innovativeness. Therefore, the study infers highly innovative consumer would perceive website quality and product usability to have more intense emotions when the website or the product designed fantastically. The study proposes that the high innovativeness of consumer characteristic has moderating effect on the relationship between product usability and emotions. The higher the consumer innovativeness is, the stronger relationships will be between website quality, product usability and emotions.

Therefore, this study examines “high-tech product innovativeness” as the moderator between website quality, product usability and emotions. Hence, the third and fourth hypotheses are proposed:

**Hypothesis 3:** Innovativeness has moderating effect on the relationship between website quality and emotions of high-tech product shopping process.

**Hypothesis 4:** Innovativeness has moderating effect on the relationship between product usability and emotions of high-tech product shopping process.

**Emotions and Shopping Value**

Increased arousal, heightened involvement, perceived freedom, fantasy fulfillment, and escapism all may indicate a hedonically valuable shopping experience (Hirschman, 1983).
Pleasure should increase consumer hedonic value through fun or entertainment and/or their utilitarian value by facilitating of completing product acquisition (Isen, 1987). Hedonic values are an expression of pleasure and anticipation; while utilitarian benefits are related to task completion and are not necessarily pleasurable or anticipated, but instead merely indicate tolerance or sometimes apprehension.

Babin et al. (1994) found that the emotions of the shopping process are positively correlated with both hedonic value and utilitarian value. They found not all consumer behavior is directed toward satisfying some functional, physical, or economic need. In addition, the validity of hedonic and utilitarian shopping value is supported by its correspondence with a number of theoretically related individual difference characteristics, behavioral measures, and situational factors. Wang et al. (2007) investigated how the social cues inherent in avatars influence affect and shopping value. They found social cues induce perceptions of website socialness, leading to increased pleasure and arousal, both of which positively influence flow, hedonic and utilitarian value, and patronage intentions. Thus, this study predicts the following hypotheses:

**Hypothesis 5a & 6a:** In the online shopping situation, shopper emotions (arousal, pleasure and dominance) can positively affect their hedonic shopping value (H5a) and utilitarian shopping value (H6a).

**Hypothesis 5b & 6b:** In the physical shopping situation, shopper emotions (arousal, pleasure and dominance) can positively affect their hedonic shopping value (H5b) and utilitarian shopping value (H6b).

**Shopping Value and Price Sensitivity**

Interestingly, the price elasticity of detergent is quite a bit larger than the food and toiletries, which are relatively more hedonic categories (Tellis, 1988). The differences in elasticity for these products may also be influenced by varying promotional frequencies of functional and hedonic goods. Wakefield and Inman (2003) suggested that consumers are lower prices sensitive when making a hedonic purchase. Because hedonic products always provide hedonic value such as entertainment and enjoyment, we propose that the hedonic value for a consumer will be higher as a result of experiencing an online shopping website and that price sensitivity will result to be lower.

When the product performance and function fit the user needs, we then consider utilitarian value to have a negative relationship with price sensitivity; however, the negative degree may be lesser than that of hedonic value. Bigné and Andreu (2004) pointed out that when consumers are experiencing greater pleasure and arousal that will show an increasing level of satisfaction as well as more favorable behavioral intentions, meaning loyalty and willingness to pay more. This reveals when consumers perceive the service or product have great quality, they experience positive emotions toward the shopping process and have more willingness to pay more. Hence, this study suggests that both hedonic and utilitarian values will influence price sensitivity negatively.
**Hypothesis 7a & 8a:** In the online shopping situation, shopper hedonic shopping value (H7a) and utilitarian shopping value (H8a) have negative relationship with their price sensitivity of purchasing high-tech products.

**Hypothesis 7b & 8b:** In the physical shopping situation, shopper hedonic shopping value (H7a) and utilitarian shopping value (H8a) have negative relationship with their price sensitivity of purchasing high-tech products.

**RESEARCH FRAMEWORK AND METHODOLOGY**

**Research Framework**

The study adopted Consciousness-Emotions-Value (C-E-V) model to examine whether the process of online and physical shopping such as consciousness, emotions, and value would have effect on consumer price sensitivity. We designed two stimuli (online website and physical trial) to carry out the study as consciousness; the elements included website quality (Study A) and product usability (Study B). The conceptual framework of the two studies was showed in Figure 1.

![Figure 1: Conceptual Framework of Study A (online) & Study B (physical).](image)

**Research Design**

The study adopted previous research measurement to measure all research constructs, and modified them based on the study scenario. Participants who had experience in online and physical shopping were legitimate to respond to the study. The participants were asked by both online- or paper-based questionnaire to express their opinions of shopping experiences. All measurement used seven point Likert scale, except for the construct of price sensitivity. There were eight items to measure this construct, the first five items were seven Likert scale, but the last three were asking the price range, such as “how much you willing to pay for the digital camera?” which adopted from Grewal et al. (2003).
Stimuli Selection

First of all, two different types of digital cameras were chosen based on the E-ICP data-base (2008), which were the top ten most popular brands in the electronic market. We named the two products as product “A” and “B”. For Study A, the website quality stimulus, three different levels of shopping website (including information, content, and appearance) were designed to distinguish the consideration of C-E-V line more efficiently, and the product price was not showed. Participants were randomly select a questionnaire and linkage for surfing and answering the whole questionnaire except for the product usability section.

For Study B, the product usability stimulus, each participants were assigned one of the products randomly and asked to try on the functions such as taking picture, adjusting the monitor light, photoflash or night scenes photo and etc.. The brand names were covered to avoid any influenced by the brand perception. It is believed that respondents could experience the digital camera interface on trail, and evaluate the product design such as the color, weight, shape, and comfort, which were related to the product usability performance, and image/ impression dimension. Participants were then asked for answering the whole questionnaire except for the website quality section.

Pilot Test

Before the formal questionnaire was formed, a pilot test was conducted to ensure the measurement reliability. There were 33 questionnaires have collected for Study A, the website situation, and 30 for Study B, the product situation. All questionnaires were valid except for two from the Study A. The results of pilot test showed all item-to-total and Cronbach’s alpha were close to or above the thresholds (0.5 and 0.7) except for the item 4 and 5 in website quality dimension – technical adequacy scale, and the item 4 in the product usability dimension – image/ impression scale. Therefore, these three items were deleted from the formal pool of questionnaire. In order to improve the items’ reliability, we also modified those items that lower but close to the threshold.

RESULTS OF DATA ANALYSES

The study used online-based questionnaire for Study A and paper-based for Study B. As results, Study A had collected 312 responses and Study B had 161 responses. There were 59 invalid for Study A and 11 for Study B. The invalid respondents were mostly categorized as such due to incomplete questionnaires or answering the reversed items in the same direction.

The demographic analysis revealed that the gender proportion was almost equal (Males=51.4%, Females=48.6%) and that majority of age range was from 20-29 (81.4%). Most of respondents had earned a bachelor’s degree or higher (93.3%). Due to the fact that the majority of the respondents were students (53.8% student, 42.8% working), their incomes were mostly below US$600 (72.5%).
Confirmatory Factor Analyses (CFA)

The study used AMOS 5.0 and adopted two-step approach for the formal data analyses. Before proceeding to test the CFA, we firstly check out the items reliability by using the thresholds of item-to-total (0.5) and Cronbach’s alpha (0.7). As results, five items were deleted due to low item-to-total, and all alpha value were above the threshold.

Under the CFA assessment, we used chi-square ($\chi^2/df < 3$) to examine the model fit. Due to the significant level of chi-square is affected by increasing of respondents; therefore, more indices are used. Table 1 exhibited the criteria and the results of model fit.

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<th>Table 1: Measurement Model Fit for Confirmatory Factor Analyses.</th>
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<td>Goodness of Fit Index (GFI)</td>
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<td>Adjusted Goodness of Fit Index (AGFI)</td>
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<td>Comparative Fit Index (CFI)</td>
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<td>RMSEA</td>
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The CFA results including standardize factor loading magnitude, and convergent validity analysis: average variance extracted (AVE) and composite reliability (CR). All factor loadings were significant ($t > 3.84$) and above the threshold of 0.5 (Hair et al., 2006). We assessed AVE and CR value separately by the Study A and B as showed in Table 2. The results showed all AVE and CR value in both studies were above the thresholds of 0.5 (Hair et al., 2006), and 0.7 (Fornell and Larcker, 1981) respectively, except for the construct of product usability of Study 2. The study found that the respondents were mostly answered different directions for the questions of the product usability’s dimensions (performance and image/impression). This might be the reason why it had lower AVE and CR value.

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<th>Table 2: Convergent Validity and Reliability Analysis.</th>
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<td><strong>Observed Variables (Study A and Study B , n=403)</strong></td>
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<td>Product Usability (Study B, n=150)</td>
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<tr>
<td>Price Sensitivity</td>
</tr>
</tbody>
</table>

Discriminant validity, the study calculated the AVE for all pairs of constructs and compared the square root value to the correlation between the two constructs of interest (Fornell and Larcker, 1981). In order to demonstrate the original value of correlation estimation, the square root of the AVE was used as a diagonal value to contrast with the original value of the correlation estimation. As the results all correlation estimation for both studies was slightly higher or lower than the diagonal value, except for the product usability of Study B.
as showed in Table 3. That revealed product usability had correlation with other constructs. Due to the nomological reasons that the concepts of product usability was adopted from Han et al. (2001), and several prior studies had applied it to examine consumer electronic products such as MP3/CD players (Eraslan, 2009), mobile phones (Yun et al., 2003) and screening products (Han and Yang, 2004). Therefore, this construct should be suitable for our study. Hence, we remained it for further analyses.

Table 3: Discriminant Validity Analysis.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Inter-Construct Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WQ</td>
</tr>
<tr>
<td>Study A</td>
<td></td>
</tr>
<tr>
<td>Website Quality</td>
<td>.839</td>
</tr>
<tr>
<td>Emotions</td>
<td>.834</td>
</tr>
<tr>
<td>Hedonic Value</td>
<td>.808</td>
</tr>
<tr>
<td>Utilitarian Value</td>
<td>.836</td>
</tr>
<tr>
<td>Price Sensitivity</td>
<td>-.585</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>.036</td>
</tr>
<tr>
<td>Study B</td>
<td></td>
</tr>
<tr>
<td>Product Usability</td>
<td>.658</td>
</tr>
<tr>
<td>Emotions</td>
<td>.982</td>
</tr>
<tr>
<td>Hedonic Value</td>
<td>.943</td>
</tr>
<tr>
<td>Utilitarian Value</td>
<td>.953</td>
</tr>
<tr>
<td>Price Sensitivity</td>
<td>-.880</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>.556</td>
</tr>
</tbody>
</table>

Notes: Diagonal value was square root of AVE value.

Structural Equation Model (SEM) Analysis

The study used maximum-likelihood estimation to assessed SEM analysis. All coefficients were standardizing. A homogeneity of variance test had been conducted; the results revealed they have no significant different between the two groups of respondents. It revealed the two groups of data were appropriate for SEM analysis.

The same model fit indices and criteria were used in the full model analysis, such as GFI, AGFI, CFI and the RMSEA. The model fit results and the path analysis with standardize coefficients of Study A and B were showed in Figure 2 and 3. It revealed both models had good fit as all indices were above the requirement values. Besides, there were five paths for the main effect in each study. It revealed all hypotheses testing were significant and supported statistically except for the hypothesis 8a, and 8b which showed insignificant. Furthermore, the path of H2, product usability towards emotions demonstrated a beta value which larger than 1 (β = 1.094). Since in the earlier discriminant analysis was also not fulfilling; therefore, we intended to modify the model of Study 2 for further analysis.
Figure 2: Results of Structural Equation Modeling- Study A.

Figure 3: Results of Structural Equation Modeling- Study B.
As mentioned earlier, the respondents mostly answered the questions of the two dimensions of product usability (performance and image/impression) in different directions. Therefore, we intended to separate the two dimensions into two independent variables to test the model. The hypothesis was named as ‘H2p’ for performance and ‘H2i’ for image impression. The path diagram and model fit results of the modification model was showed in Figure 4. They had a better results for the hypothesis H2p ($\beta=.472$, $p=.000$) and H2i ($\beta=.532$; $p=.000$). It could explain that the product image/impression would have higher effect on consumer emotion during the shopping process.

Figure 4: Path Diagram of the Modification Model (Study B).

Hierarchical Regression Analysis

The study used hierarchical regression analysis to test the moderating effect of innovativeness on the relationship between website quality, product usability and emotions. They were three models, model 1 and 2 comprised the independent variables of website quality, product usability and innovativeness; and the model 3 testing the interaction effects. Table 4 showed the results of both Study A and B. All direct effects were statistically significant except for the innovativeness on emotions in Study B. The interaction effects (model 3) for both studies also showed insignificant in the study. It revealed that innovativeness had no moderating effect on the relationship either between website quality nor product usability and emotions.
Table 4: Hierarchical Regression Analysis for Study A and B.

<table>
<thead>
<tr>
<th>Predictor variable:</th>
<th>Dependent Variable: Emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td>WQ = Website Quality</td>
<td>Study A</td>
</tr>
<tr>
<td>PU = Product Usability</td>
<td>.516***</td>
</tr>
<tr>
<td></td>
<td>.505***</td>
</tr>
<tr>
<td>Direct Effects</td>
<td></td>
</tr>
<tr>
<td>Website Quality</td>
<td></td>
</tr>
<tr>
<td>Product Usability</td>
<td></td>
</tr>
<tr>
<td>Innovativeness</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>WQ x Innovativeness</td>
<td></td>
</tr>
<tr>
<td>PU x Innovativeness</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.495</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.478</td>
</tr>
<tr>
<td>F</td>
<td>29.854***</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.479</td>
</tr>
<tr>
<td>ΔF</td>
<td>231.130***</td>
</tr>
</tbody>
</table>

Notes: ** p<.01 *** p<.001; all coefficients are standardized.

Comparison of Two Studies

The study used t-test to compare the mean values and examine the differentiation between two studies of all constructs. The results showed in Table 5. There were four constructs: emotions, hedonic and utilitarian value, as well as price sensitivity. As mentioned earlier, price sensitivity had two parts of items (part 1: seven points and part 2: price ranking); therefore, separate it into two. The results showed that emotions and the part one of price sensitivity items (PS1, PS2, and PS3) had no statistical difference between two study. However, hedonic and utilitarian value and the part 2 of price sensitivity items (PS6, PS7, and PS8) showed statistical difference between Study A and B. The mean values indicated that consumers shop with the physical products have significantly higher hedonic and utilitarian shopping value than shopping online. However, the price sensitivity of online shoppers was significantly higher than the physical product shoppers. It revealed that consumers who shop with physical products will have lower price sensitivity, and willing to pay more.

Table 5: t-Test for Comparison of Two Studies.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Studies</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotions</td>
<td>A</td>
<td>253</td>
<td>4.285</td>
<td>0.922</td>
<td>-.464</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>150</td>
<td>4.329</td>
<td>0.924</td>
<td></td>
</tr>
<tr>
<td>Hedonic Value</td>
<td>A</td>
<td>253</td>
<td>3.909</td>
<td>1.410</td>
<td>-2.132*</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>150</td>
<td>4.160</td>
<td>0.948</td>
<td></td>
</tr>
<tr>
<td>Utilitarian Value</td>
<td>A</td>
<td>253</td>
<td>4.317</td>
<td>1.427</td>
<td>-3.041**</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>150</td>
<td>4.692</td>
<td>1.034</td>
<td></td>
</tr>
<tr>
<td>Price sensitivity (PS1, PS2, PS3)</td>
<td>A</td>
<td>253</td>
<td>3.481</td>
<td>1.318</td>
<td>-.640</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>150</td>
<td>3.564</td>
<td>1.177</td>
<td></td>
</tr>
<tr>
<td>Price sensitivity (PS6, PS7, PS8)</td>
<td>A</td>
<td>253</td>
<td>4.520</td>
<td>1.218</td>
<td>2.057*</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>150</td>
<td>4.270</td>
<td>1.195</td>
<td></td>
</tr>
</tbody>
</table>

Notes: *p<.05 **p<.01
DISCUSSIONS AND RECOMMENDATIONS

Discussions

Consciousness, Emotions and Shopping Value

Similar to the previous researches, the shopping consciousness such as website quality and product usability would have positive effect on the shopper emotions (Eroglu et al., 2003; Fiore et al., 2005). When consumers browsed through the shopping websites, the quality of the website, such as full of information (i.e., content quality), technical adequacy, and the appearance of the website, including colors, layout, and etc., would affect their shopping emotions. Fiore et al. (2005) also pointed out that the more positive the evaluation of online shopping experience, the higher the intensity of the emotions of enjoyment, joy and pride; oppositely, the higher the intensity of dislike and frustration would be.

From the view point of physical products, when consumers have an opportunity to physically try and hold the product would affect their shopping emotions. Especially in the Y generation, if the physical product possessed comprehensive functions (i.e., product performance), and modern design (i.e., image/impression), it would be more favorable for these people to have one (Seva et al., 2007). Seva et al. also pointed out that the product attribute of a mobile phone positively affected consumer pre-purchase emotions.

Furthermore, the study revealed consumer emotions toward the website and the physical product have positive effect on their hedonic and utilitarian shopping value. In the shopping process, when consumers possess positive emotions (e.g., happy, enjoyment, pride, and etc.), they would perceived the shopping activities as higher hedonic and utilitarian value no matter they shopping online or with physical trial products. It is rational that when one has positive emotions towards an activity, they will think it is worth for doing so because it brings them happy and in fact, they enjoy doing it. Therefore, we can conclude that positive emotions would have positive relationship with hedonic and utilitarian shopping value.

Shopping Value and Price Sensitivity

The study expects consumer shopping values (hedonic and utilitarian) would have negative relationship with price sensitivity. However, the study only found a supporting result on the hedonic shopping value; utilitarian value was not supported. Tellis (1988) pointed out that price elasticity is more negative for all other product categories other than for pharmaceutical products. Consumers would be more concern the product safety, effectiveness, and timing rather than the price. This indicates that consumers who are more rational, they will be more concerned on the product usability rather than the price. Based on some respondents’ comments, they mostly search high-tech products on the internet for more information including price and configurations, but will visit the retailer to try the physical product performance. Because they believe it always have some differences between the internet and the physical one about the product image.

Besides, Wakefield and Inman (2003) pointed out that consumers are lower price sensitive when making a hedonic purchase. When the consumers perceived the shopping process has
hedonic value, no matter shopping online or with a trial product, they may have lower price sensitivity and higher willingness to pay more. Thus, we can conclude that perceptual consumers may have lower price sensitivity.

Moderating Effect of Innovativeness

The moderating effect of innovativeness was not supported by both studies. We think the digital camera that we used were not innovative enough (not the latest version). The products may not aroused the respondents feelings of innovativeness when they answering the questionnaire. This may be the reason why the moderating effects were not supported.

However, the some respondents comment that they willing to pay most for the new technology product such as iphone or ipad. They are just so excited to try new technology, therefore, price is not to most concern for them. Accordingly, we can posit that innovative people will have lower price sensitivity, and they are likely to pay more for the new technology products. Roehrich (2004) argued that innovativeness consumers were willing to change, try, and buy new products more often and quickly than others. As well as Goldsmith et al. (2005), they urged innovative consumers have negative correlation with price sensitivity.

Comparison of Study A and B

Based on the comparison results, consumers who shop with a trial product showed significant and higher mean score on hedonic and utilitarian value then the online shoppers. The results indicated that consumers will feel more realistic when they shop with a trial product. Hedonic value will be enhanced as they may enjoy in playing with it. Simultaneously, when the product functions can meet for their needs, which will enhance their utilitarian value.

Price sensitivity was significant when asking the respondents how much they would have willingness to pay for the product (item PS6, PS7, and PS8). These items are more direct and can reflect the ideal price of the product more accurately. The mean score of online shopping have higher price sensitivity. As mentions earlier, consumers can obtain products information from the Internet in all areas. They would also compare the internet price with retailer and will as the image of the physical product. That may increase their price sensitivity, and not willing to pay more due to the comparison of price. Shankar, Rangaswamy, and Pusateri (2001) pointed out that consumers will consider internet stores have lower operational cost, they should offer a cheaper price then the physical store.

Implications

Theoretical Implications

This study adopted CEV model to examine the linkages between website quality, product usability, consumer characteristics, emotion, shopping value, and price sensitivity toward high-tech product in online and physical shopping process. This study provides further understanding toward consumer price sensitivity between online and physical shopping process. Some related issues are discussed as below.
Firstly, previous researches have mostly discussed the willingness or intention of purchase (Fiore et al., 2005; Kulviwat et al., 2007). However, consumers will have more consideration (such as comparing the product price) to make purchase decision especially in buying high price products such as high-tech products. The study designed two consciousness issues (website quality and product usability) to compare the shopping process of online and with a physical trial product. This comparison research design method, which is rare in prior studies.

Secondly, product usability is quite a common but important construct in marketing journals. Several research (e.g., Mayhew, 1992; Nielsen, 1993) has used it in the human-computer interaction (HCI). Han et al. (2001) even adopted the concept on the research of consumer electronic products and developed a complete measurement scale for product usability. However, not too many studies have used the scale in consumer responses or behavioral intention research. Thus, we adopt product usability as antecedence to test its effect on emotions. The results found product usability has a positive effect on consumer emotions during the shopping process.

Lastly, several research have discussed price sensitivity of online and physical shopping, and focused on the products such as margarine, detergent and wine, which the low price products (Alexandru et al., 2000; Shankar, Rangaswamy and Pusateri, 2001). We used higher price products such as digital camera as research object, which was rare in prior research. Furthermore, we found that a price-range measurement of price sensitivity can be more direct and accurate to reflect the respondents’ price perception on the products.

**Managerial Implications**

We suggest that the manufacturers and the retailer (including internet and physical) should take note on the managerial strategies to attracting consumers. The manufacturers such as Sony, Canon, Casio, and etc., they should survey on the consumer needs, such as what are the functions that consumer would consider usable. We believe that to design usable functions rather then add in too many functions that may not be useful but to make the product too complicated could have more attractiveness to the consumers. For instance, a user friendly interface would let all age range of consumers learn and use easily. Besides, the product images also an important issue especially for the young people. As digital camera to be more common nowadays, they would like to have a modern product, which easy to keep and bring. They can bring it a long all the time and use it whenever they need it.

For the retailer, we suggest that retailer should well train their sales person for wide range of products categories. They can serve and introduce products more professionally based on the customer needs, and also can give them full of solution when they have any question about the trial product. That would be more convincible and the consumer would be more enjoyable in playing the trial unit, and ultimately would enhance consumers’ hedonic value during the shopping process, as well as utilitarian value when the product can fulfill their needs. That would eventually lower the consumer price sensitivity.
For the online Internet store, rich content and information are needed including detail of product configurations, the website contact, customer service contact, and etc.. Consumers would be more confident and the website would have higher trustfulness when the website have full of those contents. Besides, more photo image such as 3D panoramic photo should be included in the website. Consumers can play with the 3D image which resemble as the real product. They would feel more enjoyable and excited during the shopping process. Furthermore, we also suggest that online store should not implement price competition strategy to attract sales. They should rather highlight their service, such as convenience, fast response time, information richness and free access.

Limitations and Future Research

There are some limitations in this study. Firstly, the respondents, they were mostly students with lower income. As known young people will browse through the Internet for information when they have a need to make purchase. They may have bias on price sensitivity because they always can compare the price between online and the physical retailer for saving the cost. Future research should extend the population more widely with more age ranges. That would have difference outcome when the respondent have higher income.

Secondly, the research design, we conducted the physical trial product in a small lab, which is not a real environment of physical retail store. Future research should have conducted the study in the real store. That not only can have the results more realistic, but also can have wide range of respondents.

Third, the object (the digital camera) is too general and not the latest version. It may not arouse the innovative feeling of respondents. We suggest future research should use the product which is more innovative such as e-book, iPad, 3D TV, PDA, and etc.. The respondents should be more excited when playing these products.

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