Exploring Impulse Buying Behavior on In-App Purchase of Game App

Cheng-Hsun Ho[1*], Kuang-Hui Chiu[2], and Ai-Ni Lee[3]
Graduate Institute of Information Management, National Taipei University, Taiwan[1,3]
Department of Business Administration, National Taipei University, Taiwan[2]
jeffher@mail.ntpu.edu.tw[1], khchiu@mail.ntpu.edu.tw[2], pinknini0210@gmail.com[3]
**Corresponding Author*

Received 9 Aug 2013; received in revised form 2 Dec 2013; accepted 10 Dec 2013

Abstract

The more popular that smart phones become in the global market, the more that people are concerned about the development trends of mobile applications (apps). The main app profit model today has been gradually transformed into an In-App Purchase (IAP) model. Most of the studies in the information management field explore impulse buying intentions or behavior based on the theory of planned behavior (TPB). However, this study argues that the TPB lacks consideration of emotional factors. In the impulse buying field, emotion plays an important role. Therefore, this study proposes a framework based on cognitive emotion theory to investigate the impulse buying of IAPs on game apps. This study employed app characters as cognitive cures on account of the specific situation of mobile games. The app characters consist of sensory attribution, ease of use, and enjoyment. The findings confirm that the proposed model provides an appropriate prediction for impulse buying. This study extends cognitive emotion theory into a mobile game context. Marketers can use this information to assess their own game app in terms of what app characters can trigger impulse buying. Given the prevalence of impulse buying on mobile games and the importance of impulse purchases to an app developer's profit, this study provides useful insights into impulse-buying behavior in an app context. Overall, the study concludes by discussing theoretical implications, empirical implications, limitations, and future research directions.

Keywords: In-app purchase, impulse purchase, urge to buy, cognitive emotion theory

1. Introduction

The IDC (2011) survey report pointed out that app market revenue is expected to grow from US$10.7 billion in 2012 to US$182.7 billion in 2015, growing more than 10 fold. Additionally, Gartner's mobile market report showed that the App market is growing quickly, and the main business model of Apps is changing from "direct purchase" to "In-App Purchasing" (Gartner, 2012). An App purchase from the App Store is called an "In-App Purchase", which provides the user with a free or paid App. Additionally, it also provides the user with a channel to buy value-added features, such as virtual items, functions and so on.

Between the plan to buy and unplanned procurement, implicit rational buying behavior and impulse buying behavior may trigger the issues of this study, which is to investigate the research question: is a mobile game app purchase an example of impulse buying behavior? In general, most software purchases are a one-time direct purchase mode, but App profit models are based on repeated purchases. For App software development vendors, how to develop a business model for creating and enhancing profitability is an important issue of operational management. However, the related field of academic research is still scarce. Therefore, questioning the impact factors of emerging

buying patterns is worthy of further investigation.

Consumers often act impulsively when making online decisions. An insight into consumer buying behavior is vital for IAP practitioners as it is important to understand the nature of such IAP buying behavior. Surprisingly, there has been little research into the influence of IAPs on impulse buying behavior. The vast majority of e-commerce research has viewed consumer decision-making as a rational process, based on cognitive problem solving and information processing. Many past studies have adopted the theory of planned behavior (TPB) to explain impulse purchase intentions (Chang, 2012). This study argues that the TPB model lacks consideration of the emotional factors, and that there are findings that indicate that impulse buying behavior is influenced by emotional factors (Rook, 1987; Weinberg and Gottwald, 1982). Therefore, this study proposes emotional theoretical perspectives to explore the impact of the intention to buy on impulse. Reviewing the literature on impulse buying, some scholars have pointed out that negative emotions positively affect the urge to buy (Silvera, Lavack, and Kropp, 2008; Verplanken, Herabadi, Perry, and Silvera, 2005), whereas other scholars find there is a negative impact (Beatty and Ferrell, 1998; Verhagen and Dolen, 2011).

As mentioned above, this study argues whether emotion theory can explain impulse buying of IAPs, and explores the role of app characters. Additionally, these two questions have never been revealed and discussed in past studies. Therefore, the purposes of this study are: (1) to explore the relationship between software characteristic factors and impulse buying intentions; and (2) to explore the impact of positive and negative emotions on the urge to buy.

2. Literature Review

2.1 Impulsive Buying

In the field of impulse buying research there are a variety of definitions for impulse buying. Stern (1962) was the first person to propose the dimensions of impulse purchases. He divided impulse buying into four categories, collectively referred to as the impulse mix (including pure impulse buying), reminded impulse buying, suggestion impulse buying, and planned impulse buying. Weinberg and Gottwald (1982) explored impulse buying from three dimensions, including affective, cognitive, and reactive. The affective dimension is stimulated impulse buying behavior following a strong emotional situation for the consumer; the cognitive dimension is the consumer's lack of rational control when making an impulse buying decision; and the reactive dimension means the consumers' impulsive behavior is spontaneous as the result of specific environmental stimuli. The present study emphasizes impulse buying mainly influenced by emotional factors. These kinds of factor create a sudden desire, but also a spontaneous reaction that lacks rational control.

The urge to buy proposed by Rook (1987) in his impulse buying research, stressed the urge is sudden and immediate. The higher extent to which it is possible to impulse buy occurs when people encounter products that generate an urge to buy, without any thoughtful consideration for the reason why it is necessary to buy the product. Sometimes, the urge to buy is uncontrollable, and consumers may, therefore, feel temporarily out of control (Verhagen and Dolen, 2011). The sensation of the urge to buy is a desired state when encountering the product (Beatty and Ferrell, 1998). Wells et al. (2011) explored online environments for context impulse buying behavior. Although this improvisation or impulsive purchase intention is intense and sometimes unable to resist, consumers do not necessarily take the action to purchase every time (Rook and Fisher, 1995). In fact, consumers will use many tactics to gain control of the urge to buy (Hoch and Loewenstein, 1991).

2.2 Cognitive Emotion Theory

Some of the past literature on impulse buying discusses consumer impulse buying behavior by rational factors and emotional facets. Verhagen and Dolen (2011) explored the emotional impact of factors that lead to impulse buying behavior based on impulse buying literature, and proposed the cognitive emotion theory (CET). The cognitive emotion theory has been employed in many fields, and has provided an important explanatory power than other perspectives (Frijda, 2010).

The authors propose a research framework which is based on the literature on impulse buying and derives its theoretical structure from the CET. According to this, observing a stimulus, and the consequent formation of evaluative perceptions, causes emotions. Thus, beliefs can be assumed to precede emotions (Reisenzein, 2009). This structure has been shown to be robust in many consumer emotion studies and is empirically favored over other views. The authors further propose an emotion–action tendency link, because it is expected that emotions led to impulsive action tendencies and thus to impulse buying (Frijda, 2010). The conceptualization of impulse buying in the consumer behavior literature, the urge to buy, and overt impulse buying behavior were included as facets of the impulsive actions that are determined by emotions.

The cognitive emotion theory is based on the four emotional elements proposed by Kleinginna and Kleinginna (1981), including affective, cognitive, conative, and physiological concepts. Emotion is a combination of the four factors and can be given different weights (Wirth and Schramm, 2005).

Much of the research on emotions has pointed out in most of the time and most of the emotion need to cognitive as antecedents in fact (Elster, 1999; Nussbaum, 2001; Solomon, 2008). If a person interprets an event or object as either good or bad it will lead to different emotions (Andrew, Clore, and Allan, 1988; Smith and Lazarus, 1993).

Affection or mood has been confirmed to be strongly influenced by a variety of actions, including impulse buying behavior (Gardner and Rook, 1988; Rook, 1987; Rook and Gardner, 1993). There are many emotional views presently, but most of these are divided into two categories, positive affection and negative affection (Laros and Steenkamp, 2005). Positive affections and negative affections are two distinguished dimensions (Watson, Clark, and Tellegen, 1988), similar to positive and negative emotions (Rook and Gardner, 1993).

Positive affection reflects the degree to which a person feels warm, active, and astute, and it is also a state of high energy, concentration, and is enjoyable to participate in (Watson, Clark, and Tellegen, 1988). Rook and Gardner (1993) stated that the majority of respondents represented that the more the positive affective, the higher the probability of impulse buying. Negative affection is a psychological state of feeling depressed and unpleasant, and other bad emotions, such as anger, disgust, and guilt (Watson et al., 1988).

2.3 App Characters

Using cognitive emotion theory as a theoretical lens, the authors proposed and empirically tested a model relating to three IAP beliefs about sensory attributes, ease of use, and enjoyment related to consumer impulse buying behavior, mediated by the consumers' emotions. The selection of these three IAP beliefs was considered relevant for three reasons.

First, they have proven to be vital elements of a purchase environment image, as consumers deemed them important. Purchase environment image is assumed to stimulate impulse buying, making an investigation of its key beliefs of particular interest.

Second, these three beliefs were expected to play a crucial role in emotional and less-planned purchase situations, making an empirical examination worthwhile.

Finally, these beliefs mirror important online store features that online retailers

apply in order to serve their customers. Thus, the managerial value of this study lay in proving the importance of the beliefs in impulsive buying settings.

Reviewing the impulse buying literature, some argue that the urge to buy or impulse behavior is affected by emotions (Beatty and Ferrell, 1998; Rook, 1987; Rook and Gardner, 1993; Verhagen and Dolen, 2011; Weinberg and Gottwald, 1982). Some studies on emotion point out that most emotion has cognition as an antecedent factor (Elster, 1999; Nussbaum, 2001; Solomon, 2008).

Impulse buying researches on online shopping or online gaming proposed that there are many emotional antecedent factors that lead to impulse buying, such as attractiveness (Tao, Cheng, and Sun, 2009; Verhagen and Dolen, 2011), playfulness (Chiang, Sunny, Cheng, and Liu, 2011; Hsu and Lu, 2004; Shin, 2010; Tao et al., 2009), and perceived security (Shin, 2010; Wells, Parboteeah, and Valacich, 2011). These factors are proven to influence positive or negative emotions.

Some scholars argue that consumers usually need to obtain ample information on sensory attributes before purchasing specific products, such as color, design, pattern, fitness and so on (Bei, Chen, and Widdows, 2004; Kim and Knight, 2007; Park and Stoel, 2002; Watchravesringkan, and Shim, 2003). For instance, when women go shopping they will collect popular seasonal colors and styles before making purchasing decisions (Rowley, 2002).

Ease of use is often used in studies about technology acceptance model (TAM) or theory reasoned action (TRA). Davis (1989) defined these as when individuals believe the degree of using a particular system is easy. Because of the wide usage of TAM by many researches, ease of use is also widely adopted by many empirical studies across time, race, and technology (Agarwal and Karahanna, 2000; Chau and Hu, 2001; Hong, Thong, Wong, and Tam, 2002; Hu, Chau, Sheng, and Tam, 1999; Hans van der Heijden, 2003). Therefore, ease of use can be regarded as a stable measured variable in any research context, and it has been applied in impulse buying studies in recent years.

For the past few years, enjoyment has been regarded as a hedonic factor in many researches (Shin, 2010), and can be defined as the degree to which implemented activities are perceived as providing pleasure and fun, aside from performance results.

Finally, the study focused on the distinction between functional convenience (sensory attribution; ease of use) and representational delight beliefs (enjoyment). It has been suggested that these elements are likely to lead to impulsive buying behavior (Madhavaram and Laverie, 2004).

3. Methodology

3.1 Research Framework

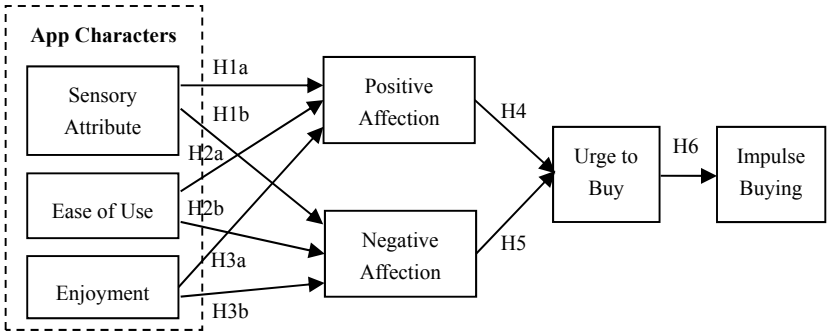

Figure 1: Research Framework

3.2 Hypothesis Development

The senses perceived by consumers from productive attraction will affect the generation of affection (Rook, 1987). The timing that consumers emerge purchasing desires when considered the product have strong attraction after collecting the relative information is the most difficult to resist (Jones, Reynolds, Weun, and Beatty, 2003; Rook, 1987). Once the desires emerge, the reference point for the consumer products will change (Hoch and Loewenstein, 1991). Kim and Knight (2007) explored impulse buying behavior on shopping websites, and pointed out that websites should provide products with aesthetic sense for customers, such as color and design attributes. The sensory attributes can affect consumers in different ways, either emotionally or affectively, producing the urge to buy. In summary, the study proposes:

H1a: The sensory attribute is positively associated with positive affection.
H1b: The sensory attribute is negatively associated with negative affection.

Éthier, Hadaya, Talbot, and Cadieux (2006) investigated the behavior of impulse buying, and found a consumer's awareness to the product included ease of use, and that positive affection and negative affection have positive and negative effects. Verhagen and Dolen (2011) showed that ease of use affects positive and negative affections. This study speculated that ease of use will thereby affect the urge to buy when playing mobile game apps. For example, during a game, an App may show a notification to users "if you want to go to the next level, please buy it!" when the game is in full swing and users may then have the urge to buy. The opportunity for impulsive buying may be higher if the purchase steps are also very easy and just need a few clicks. Therefore, this study hypothesizes:

H2a: Ease of use is positively associated with positive affection.
H2b: Ease of use is negatively associated with negative affection.

In many studies, enjoyment is regarded as a hedonic factor (Shin, 2010). In the past literature in the field of online games, some argue that enjoyment is the most important driving factor for users to continue playing online games (Childers, Carr, Peck, and Carson, 2002; Dabholkar and Bagozzi, 2002). Some findings on impulse buying behavior research have mentioned that consumers consider the higher enjoyment of the product will enhance the generation of positive affection and increase the urge to buy (Dholakia, 2000; Rook and Fisher, 1995; Shiv and Fedorikhin, 1999). Some findings showed that enjoyment positively influences positive affection and has a negative impact on negative affection (Parboteeah et al., 2009; Verhagen and Dolen, 2011). Hence, the present study proposed:

H3a: Enjoyment is positively associated with positive affection.
H3b: Enjoyment is negatively associated with negative affection.

Consumers who take part in impulse buying are affected by affective factors (Rook, 1987; Weinberg and Gottwald, 1982). Individuals who produce the urge to buy usually lack rational control, but are affected by affective factors (Weinberg and Gottwald, 1982). Nevertheless, the urge to buy doesn't preclude the process of information, so in this process, affection plays a key role (Laros and Steenkamp, 2005). Verhagen and Dolen (2011) investigated the emotional factors that lead to the urge to buy using cognitive emotion theory. The results showed that a consumer's positive and negative affections have a significant impact on the urge to buy.

Rook and Gardner (1993) pointed out that most respondents said the probability of producing the urge to buy increased with positive affection. It means that positive emotions may stimulate people to get instant gratification through the purchase of a

product and satisfy the desire to buy (Verhagen and Dolen, 2011). Individuals will be more likely to produce the desires of shopping and use impulse buying in order to attain a better mood than in normal time if consumers have negative emotions (Piron, 1991). However, some scholars find that negative affection will negatively affect the urge to buy (Verhagen and Dolen, 2011). Therefore, the study hypothesized:

H4: Positive affection is positively associated with the urge to buy.

H5: Negative affection is negatively associated with the urge to buy.

Several marketing academics have investigated impulse buying and whether purchase intention is formed before the resulting purchasing behavior. Kollat and Willett (1967) considered "whether purchase intention is formed before buying the product" and "actual purchase behavior", as the basis of consumer behavior, can be divided into five consumption types. One kind of consumption type is when "consumers don't generate demand for the product until seeing the product and suffer stimulation", and it can be regarded as pure, impulsive buying. Some scholars have defined an impulse purchase as the result of a purchase that doesn't form a purchase intention first, but results in a strong desire suddenly and immediately (Beatty and Ferrell, 1998; Parboteeah et al., 2009). With an increase in the urge to buy, the possibility of impulsive buying behavior will increase (Beatty and Ferrell, 1998). The study proposes:

H6: The urge to buy is positively associated with impulse buying.

3.3 Instrument Development

Rook (1987) proposed the urge to buy in impulse buying research, and emphasized that the urge is a sudden and immediate purchasing desire. In this study, the urge to buy is defined as "a psychological state whereby the individual generates a strong purchasing intention urgently, suddenly, and immediately". The operational definition of the urge to buy refers impulse buying studies developed by many scholars. Adjustments and modifications have been made, based on the context of this study, to suit the three purposes proposed (Verhagen and Dolen, 2011; Wells et al., 2011; Wittmann and Paulus, 2008). Respondents were required to answer based on their recent purchasing experience if they have bought an "In-app purchase" item.

Sensory attributes, ease of use, and enjoyment are summed up through the past literatures regarding the field of online shopping and online gaming. The three dimensions are the emotional antecedents of the urge to buy. Additionally, Madhavaram and Laverie (2004) considered that "impulse buying" isn't limited to any particular type of product or environment, so the items of the three dimensions were developed and modified based on past researches to appropriately measure the context of this study.

Sensory attributes include three items which are modified from the scales developed by Hans van der Heijden (2003), Peck and Childers (2003), Tao et al. (2009), and Heijden (2003). In this study, sensory is defined as when "consumers perceived the multimedia effects in the mobile game apps".

Ease of use is developed by the TAM, and Davis (1989) defined it as an individual's belief in the degree of easiness when using a particular system. In this study, the definition of ease of use is "the degree of ease to use a mobile game app for consumers". Operation of the dimension is also integrated and the modified sales developed from past literatures about impulse buying or online game behavior, a total of three items (Éthier et al., 2006; Hsu and Lu, 2004; Verhagen and Dolen, 2011).

Enjoyment is a hedonic factor (Shin, 2010) and can be defined as the degree to which implemented activities are perceived as providing pleasure and fun, aside from performance results. The definition for the present study is "the pleasure obtained in

the gaming process for consumers". The three items of enjoyment are modified from Shin's study (2010), which investigated users' behavior in massively multiplayer online role-playing game (MMORPG), and Heijden (2003) who explored user behavior when using information systems. In addition, the study also makes reference to several researches that proposed enjoyment as an antecedent of behavior (Nysveen, Pedersen, Thorbjørnsen, and Berthon 2005; Koufaris, 2002; Wu and Liu, 2007) and which were revised in accordance with "in-app purchases" of the research context.

In the present study, the definition of positive affection is "a positive mental state whereby consumers feel positive emotions and have the enthusiasm to participate"; negative affection is "a negative mental state whereby consumers feel negative emotions, such as dispirited, disgust, depression and others". The scales for impulse buying behavior that developed online shopping or other online environments (Éthier et al., 2006; Silvera et al., 2008; Verhagen and Dolen, 2011; Watson et al., 1988) are the basis for modification of the two dimensions, a total of seven items.

An online survey was used to collect empirical data. Survey information was published on PTT BBS, the largest online bulletin board system in Taiwan. The authors posted invitations on mobile phone related forums of PPT. The invitation included a link to our web-based survey, which elicited data for In-App Purchase and user demographics.

4. Results

4.1 Sample Profile

The study authors developed a questionnaire and conducted a survey to collect data. A total of 267 responses were received, of which 20 were dropped due to incomplete data or no experience of purchasing an IAP. The valid respondents were 247. Most of the respondents were university students, including 157 males and 90 females. The main age group was between 16 and 20 years old (42.5%). Most of the respondents were college (61.5%) and graduate (55.5%) students. Most of the respondents stated that they spend 4-6 hours (33.2%) playing mobile game apps every week.

Partial least squares (PLS) is a theory-based approach to conceptualization that has been designed to integrate both theory and data, and hence, provide a better platform than traditional multivariate techniques from which to construct and verify theory. Given the prediction-oriented nature of this study and the complexity of the model, PLS was the preferred technique for testing the structural model. Instrument reliability and validity were assessed using confirmatory factor analysis (CFA). CFA was performed in this study using the smart PLS and the results are shown in Table 1. All of the item loadings were greater than 0.7, and all Cronbach's α, composite reliability (CR), and average variance extracted (AVE) exceeded the criterion values of 0.7, 0.7, and 0.5, respectively (Bagozzi and Yi, 1988; Gefen, Straub, and Boudreau, 2000; Nunnally, 1978). The correlation matrix in Table 1 indicates that the square root of AVE (listed within parentheses alongside the principal diagonal) of each construct was higher than the corresponding correlation values, thereby assuring discriminant validity. Table 1 shows the instrument had an acceptable reliability and validity.

Table 1: Instrument reliability and validity.

Variables	SA	EOU	EJ	PA	NA	UTB	IB
SA	**.823**						
EOU	.443	**.857**					
EJ	.641	.459	**.890**				
PA	.465	.332	.587	**.834**			
NA	-.339	-.341	-.438	-.227	**.889**		
UTB	.407	.340	.410	.374	-.326	**.855**	
IB	.160	.247	.219	.328	-.104	.502	**.764**
Cronbach's α	.759	.820	.868	.854	.867	.815	.769
CR	.862	.892	.919	.901	.919	.891	.849
AVE	.677	.734	.792	.695	.790	.731	.584
R^2				.360	.218	.201	.252

Note:
SA: sensory attribute, EOU: ease of use, EJ: enjoyment, PA: positive affection, NA: negative

affection, UTB: urge to buy, IB: impulsive buying.
Numbers on the diagonal (in boldface) are the square of the average variance extracted.

4.2 Hypothesis Tests

The results of the PLS analysis of the research model are presented in Figure 2. It shows the results of the structural model with moderator variables. Sensory attribute had a positive influence on positive affection (β=.137, t=2.666), and had a non-significant influence on negative affection (β=-.056, t=-.832). Ease of use was non-significant for positive affection (β=.054, t=.973), and had a negative influence on negative affection (β=-.166, t=-2.737). The influences of enjoyment on positive affection (β=.475, t=8.801) and negative affection (β=-.326, t=-4.402) were significant, respectively. Positive affection exhibited a positive effect with the urge to buy (β=.317, t=6.991). In contrast, negative affection was exhibited as a negative effect with the urge to buy (β=-.254, t=-5.427). Finally, impulse buying was successfully predicted by the urge to buy (β=.502, t=10.547). In this model, the total variance explained was 25.2% for impulse buying, 20.1% for the urge to buy, 36% for positive affection, and 21.8% for negative affection.

The findings supported all the hypotheses except H1b and H2a. The results of the present study demonstrated that the proposed model might be appropriate for explaining the consumption behavior of IAP.

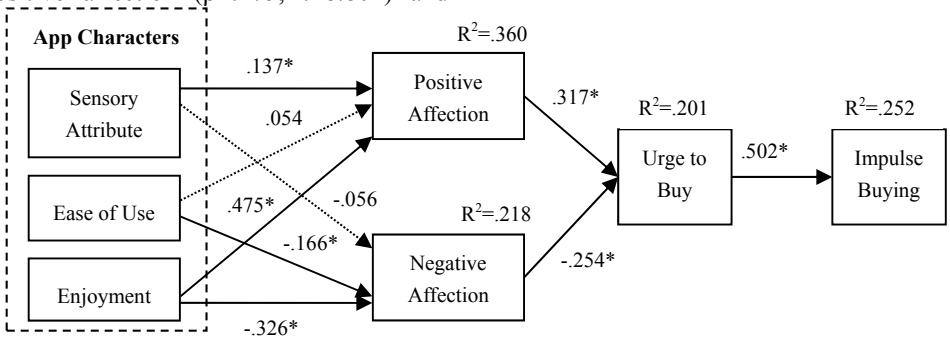

Figure 2: Result of Data Analysis

5. Discussion

Most the impulse buying studies are based on physical stores or online shopping websites. Consequently, it's rare in the emerging mobile device applications. Moreover, the game app market has developed a new profit model, in-app purchase, and this has become the main source of profit. However, literature for the impulse buying field that has investigated "in-app purchase" is scant. Therefore, this study has attempted to fill this research gap.

This study provided three important results: (1) a conceptual understanding of the impulse buying process on IAP; (2) the role of user emotions between app beliefs and impulse buying, thus confirming the applicability of CET in impulse buying situations; and (3) how app beliefs may function as cognitive determinants of online impulse buying.

5.1 Theoretical Implication

Most of the studies exploring impulse buying intention or behavior are based on the TPB (Chang, 2012). This study argues that the TPB lacks consideration of emotional factors. Some researchers have shown that impulse buying consumers will be affected by emotional factors (Rook, 1987; Weinberg and Gottwald, 1982). Hence, the authors proposed a CET framework to interpret impulse buying relating to the IAPs of the game apps.

The findings from the past literature are not consistent in the relationship between negative affections and the urge to

buy, and some have pointed out that it's positively affected (Silvera, Lavack, and Kropp, 2008; Verplanken, Herabadi, Perry, and Silvera, 2005), others demonstrated that it's negatively affected (Verhagen and Dolen, 2011). This study proposed that negative affections have a negative effect on the urge to buy. The effect of negative affection negatively affecting the urge to buy was significant, and the result was consistent with the previous researches (Beatty and Ferrell, 1998; Verhagen, and Dolen, 2011).

The impact of sensory attributes on positive affection was supported. The result matches the findings of past studies (Kim and Knight, 2007). The result indicates that sensory attributes play an important role in the antecedents of positive affection. However, the influence of sensory attribute on negative affection is not supported. It might be that the influence of sensory attributes on negative affection is not strong enough. The authors also suggest that future researchers elaborate this issue deeply.

The relationship between ease of use and positive affections was not consist with the past research (Verhagen and Dolen, 2011). Ease of use in Verhagen and Dolen's findings are not supported for both positive and negative affections, but are significant on the negative affection in this study. The reason might be that users think that being easy to use is one of the essences of the mobile game app market. Users might not feel more pleasure when playing game apps that have the feature of ease of use, and might feel more aversion to mobile game apps that are hard to use.

Finally, this study proposes an impulse buying model to explain IAP purchasing behavior, and demonstrates that emotional factors play an important role in impulse buying behavior. It is also argued that cognitive emotion theory can explain impulse buying intention, in addition to the theory of planned behavior.

5.2 Empirical Implication

In the study, it is suggested that game app designers should pay more attention to providing a user interface, and that the rules of the game are that users don't spend a lot of effort and time to understand how to use the game, how many functions, and how to obtain enjoyment. It is also suggested that businesses must provide good multimedia experiences for consumers, such as color, content design, page layout, sound and light effects, etc. These factors will affect users' in-app purchase decisions. Businesses should consider how to design game apps with enjoyment, fun, and playfulness, and these may raise the user's positive emotion, which then results in impulse buying behavior.

From a managerial perspective, this study has several implications. First, it can be seen that sensory attributes, ease of use and enjoyment were important to impulsive buying settings. In order to stimulate impulsive buying, app developers should create a friendly, knowledgeable, fun app, providing pleasure when a user plays an app game. Second, this study provides the first indication that game apps should focus on stimulating positive affections rather than reducing negative affections. By making the playing experience exciting, enthusiastic and inspiring, positive emotions are triggered with possible impulsive buying as a consequence.

Moreover, the findings of this study might help enterprises to understand the purchasing behavior of In-App Purchases in depth, and enable them to develop an appropriate marketing strategy to increase profits.

5.3 Limitations

This study has some limitations that should be considered for future research. First, it was carried out within a specific domain of the IAP of game apps, so it is uncertain whether the generalized theoretical findings can be used broadly or for other types of apps. Second, typical limitations are associated with the research design because of the cross-sectional nature of the study. Finally, the authors suggest a mixed methodology for future research to explore the powerful variables that might help ex-

plain and improve the prediction power of the model.

References

Agarwal, R. & Karahanna, E. (2000). Time flies when you're having fun: cognitive absorption and beliefs about information technology usage 1. *MIS quarterly*, *24*(4), 665-694.

Andrew, O., Clore, G. L. & Allan, C. (1988). The Cognitive Structure of Emotions. Cambridge: Cambridge University Press.

Bagozzi, R. P. & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74-94.

Beatty, S. E. & Ferrell, E. M. (1998). Impulse buying: Modeling its precursors. *Journal of Retailing*, *74*(2), 169-191.

Bei, L. T., Chen, E. Y. I. & Widdows, R. (2004). Consumers' online information search behavior and the phenomenon of search vs. experience products. *Journal of Family and Economic Issues*, *25*(4), 449-467.

Chang, T, Y, (2012). *Is In-App Purchases an Unplanned Behavior*? Master's dissertation, National Central University, Taoyuan.

Chau, P. Y. K. & Hu, P. J. H. (2001). Information Technology Acceptance by Individual Professionals: A Model Comparison Approach. *Decision Sciences*, *32*(4), 699-719.

Chiang, Y. T., Sunny, S. J., Cheng, C. Y. & Liu, E. Z. F. (2011). Exploring Online Game Players' Flow Experiences and Positive Affect. *Turkish Online* Journal *of Educational Technology*, *10*(1), ??-??.

Childers, T. L., Carr, C. L., Peck, J. & Carson, S. (2002). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing*, *77*(4), 511-535.

Dabholkar, P. A. & Bagozzi, R. P. (2002). An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, *30*(3), 184-201.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.

Dholakia, U. M. (2000). Temptation and resistance: An integrated model of consumption impulse formation and enactment. Psychology and Marketing, *17*(11), 955-982.

Elster, J. (1999). *Alchemies of the Mind*. Cambridge; Cambridge Univ Press.

Éthier, J., Hadaya, P., Talbot, J. & Cadieux, J. (2006). B2C Web site quality and emotions during online shopping episodes: An empirical study. *Information and Management*, *43*(5), 627-639.

Frijda, N. H. (2010). Impulsive action and motivation. *Biological psychology*, *84*(3), 570-579.

Gardner, M. P & Rook, D. W. (1988). Effects of impulse purchases on consumers' affective states. *Advances in Consumer Research*, *15*(1), 127-130.

Gartner Gartner Says Free Apps Will Account for Nearly 90 Percent of Total Mobile App Store Downloads in 2012. Retrieved March, 22, 2013 from http://www.gartner.com/newsroom/id/2153215

Gefen, D., Straub, D. W. & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, 4(7), 1-70.

Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands. *Information and Management, 40*(6), 541-549.

Hoch, S. J & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of consumer research*, *17*(4) 492-507.

Hong, W., Thong, J. Y. L., Wong, W. M. & Tam, K. Y. (2002). Determinants of user acceptance of digital libraries: An

empirical examination of individual differences and system characteristics. *Journal of management information systems*, *18*(3), 97-124.

Hostler, R. E., Yoon, V. Y., Guo, Z., Guimaraes, T. & Forgionne, G. (2011). Assessing the impact of recommender agents on on-line consumer unplanned purchase behavior. *Information and Management*, *48*(8), 336-343.

Hsu, C. L. & Lu, H. P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information and Management*, *41*(7), 853-868.

Hu, P. J., Chau, P. Y. K., Sheng, O. R. L., & Tam, K. Y. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of management information systems*, *16*(2), 91-112.

IDC (2011/8). Mobile-Developer-Report. Retrieved March, 20, 2013 from http://the.appconomy.com/wp-content/uploads/2011/08/Appcelerator-IDC-Q3-2011-Mobile-Developer-Report.pdf

Jones, M. A., Reynolds, K. E., Weun, S., and Beatty, S. E. (2003). The product-specific nature of impulse buying tendency. *Journal of Business Research*, *56*(7), 505-511.

Kim, E. Y. & Knight, D. K. (2007). A path analytic exploration of consumer information search in online clothing purchases. *Journal of the Korean Society of Clothing and Textiles*, *31*(12), 1721-1732.

Kleinginna, P. R. & Kleinginna, A. M. (1981). A categorized list of emotion definitions, with suggestions for a consensual definition. *Motivation and emotion*, *5*(4), 345-379.

Kollat, D. T. & Willett, R. P. (1967). Customer impulse purchasing behavior. *Journal of Marketing Research*, 21-31.

Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research*, *13*(2), 205-223.

Laros, F. J. M. & Steenkamp, J. B. E. M. (2005). Emotions in consumer behavior: a hierarchical approach. *Journal of Business research*, *58*(10), 1437-1445.

Madhavaram, S. R. & Laverie, D. A. (2004). Exploring impulse purchasing on the internet. *Advances in Consumer Research*, *31*(1), 59-66.

Nunnally, J. C. (1978). *Psychometric theory*. NewYork, NY: McGraw-Hill.

Nussbaum, M. C. (2001). *Upheavals of Thought. The Intelligence of Emotions.* Cambridge: Cambridge University Press.

Nysveen, H., Pedersen, P. E., Thorbjørnsen, H. & Berthon, P. (2005). Mobilizing the Brand The Effects of Mobile Services on Brand Relationships and Main Channel Use. *Journal of Service Research*, *7*(3), 257-276.

Parboteeah, D. V., Valacich, J. S. & Wells, J. D. (2009). The influence of website characteristics on a consumer's urge to buy impulsively. *Information Systems Research*, *20*(1), 60-78.

Park, E. J., Kim, E. Y., Funches, V. M. & Foxx, W. (2011). Apparel product attributes, web browsing, and e-impulse buying on shopping websites. *Journal of Business Research*, doi: 10.1016/j.jbusres.2011.02.043

Park, J. H. & Stoel, L. (2002). Apparel shopping on the Internet: Information availability on US apparel merchant Web sites. *Journal of Fashion Marketing and Management*, *6*(2), 158-176.

Peck, J. & Childers, T. L. (2003). To have and to hold: The influence of haptic information on product judgments. *Journal of Marketing*, *67*(2) 35-48.

Piron, F. (1991). Defining impulse purchasing. *Advances in Consumer Research*, *18*(1), 509-514.

Reisenzein, R. (2009). Emotions as metarepresentational states of mind: Naturalizing the belief–desire theory of

emotion. *Cognitive Systems Research*, *10*(1), 6-20.

Rook, D. W. (1987). The buying impulse. *Journal of consumer research*, *12*(12) 189-199.

Rook, D. W. & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. *Journal of consumer research*, *22*, 305-313.

Rook, D. W. & Gardner, M. P. (1993). In the mood: impulse buying's affective antecedents. *Research in consumer behavior*, *6*(7), 1-28.

Rowley, J. (2002). Window shopping and browsing opportunities in cyberspace. *Journal of Consumer Behaviour*, *1*(4), 369-378.

Shin, D. H. (2010). The dynamic user activities in massive multiplayer online role-playing games. *Intl. Journal of Human–Computer Interaction*, *26*(4), 317-344.

Shiv, B. & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of consumer research*, *26*(3), 278-292.

Silvera, D. H., Lavack, A. M. & Kropp, F. (2008). Impulse buying: The role of affect, social influence, and subjective wellbeing. *Journal of Consumer Marketing*, *25*(1), 23-33.

Smith, C. A. & Lazarus, R. S. (1993). Appraisal components, core relational themes, and the emotions. *Cognition and Emotion*, *7*(3-4), 233-269.

Solomon, R. C. (2008). The Philosophy of Emotion. In Lewis, M., Haviland-Jones, J. M., and Barrett, L. F. (Eds.), *Handbook of Emotions (3rd ed.)* (pp.3-15). NY: The Guilford Press.

Tao, Y. H., Cheng, C. J. & Sun, S. Y. (2009). What influences college students to continue using business simulation games? The Taiwan experience. *Computers and Education*, *53*(3), 929-939.

Verhagen, T. & Dolen, V. W. (2011). The influence of online store beliefs on consumer online impulse buying: A model and empirical application. *Information and Management*, *48*(8), 320-327.

Verplanken, B., Herabadi, A. G., Perry, J. A. & Silvera, D. H. (2005). Consumer style and health: The role of impulsive buying in unhealthy eating. *Psychology and Health*, *20*(4), 429-441.

Watchravesringkan, K. & Shim, S. (2003). Information search and shopping intentions through Internet for apparel products. *Clothing and Textiles Research Journal*, *21*(1), 1-7.

Watson, D., Clark, L. A. & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, *54*(6), 1063.

Weinberg, P. & Gottwald, W. (1982). Impulsive consumer buying as a result of emotions. *Journal of Business research*, *10*(1), 43-57.

Wells, J. D., Parboteeah, V. & Valacich, J. S. (2011). Online impulse buying: understanding the interplay between consumer impulsiveness and website quality. *Journal of the Association for Information Systems*, *12*(1), 32-56.

Wirth, W. & Schramm, H. (2005). Media and emotions. *Communication research trends*, *24*(3), 1-39.

Wittmann, M. & Paulus, M. P. (2008). Decision making, impulsivity and time perception. *Trends in Cognitive Sciences*, *12*(1), 7-12.

Wu, J. & Liu, D. (2007). The effects of trust and enjoyment on intention to play online games. *Journal of electronic commerce research*, *8*(2), 128-140.

Appendix A. Measurement scales

Sensory attribute

1. Overall, I find that the game app looks attractive.
2. The visual effects of the game app are attractive.

3. The audio effects that are used on the game app are attractive.

Ease of use

1. It is easy for me to become skillful when playing this game app.
2. Learning to play this game app is easy for me.
3. This game app is easy to play.

Enjoyment

1. Using this game app provided me with a lot of enjoyment.
2. I am happy when I use this game app.
3. I enjoyed using this game app because it is exciting.

Positive affection

1. While playing this game app I was excited.
2. While playing this game app I was enthusiastic.
3. While playing this game app I was proud. <Reverse>
4. While playing this game app I was inspired.

Negative affection

1. While playing this game app I was distressed.
2. While playing this game app I was upset.
3. While playing this game app I was irritable.

Urge to Buy Impulsively

1. On playing this game app, I experienced a number of sudden urges to buy things.
2. On playing this game app, I saw a number of things I wanted to buy even though they were not on my purchase list.
3. On playing this game app, I experienced no strong urges to make unplanned purchases on this trip. <reverse>
4. On playing this game app, I felt a sudden urge to buy something.

Impulse Buying

1. My IAP purchase was spontaneous.
2. My IAP purchase was unplanned.
3. I did not intend to do this IAP purchase before play this game app.
4. Before play this game app, I did not have the intention to do this IAP purchase.

I could not resist this IAP purchase at the site. <Reverse>

About Authors

Cheng-Hsun Ho is an assistant professor in the graduate institute of information management at National Taipei University. His research interests include internet marketing, electronic commerce, online behavior, and information management. He has published papers in journals such as International Journal of Electronic Business Management, BMC Health Services Research, Computer Methods and Programs in Biomedicine.

Kuang-Hui Chiu is professor and head of the department of business administration at National Taipei University. His current research interests are in the general area of Information Management. He has published papers in journals such as Telemedicine and e-Health, Journal of Information & Optimization Sciences, International Journal of Business & Management Science, Applied Mathematics & Information Sciences, Electronic Commerce Studies.

Ai-Ni Lee is a MBA student in the Graduate institute of information management at National Taipei University.