**Association for Information Systems**
**AIS Electronic Library (AISeL)**

PACIS 2017 Proceedings

Pacific Asia Conference on Information Systems (PACIS)

Summer 7-20-2017

# Exploring Consumers' Intention to Urge to Buy in Mobile Commerce: The Perspective of Pleasure-Arousal-Dominance

Li-Ting Huang
*Chang Gung University*, Lthuang@mail.cgu.edu.tw

Follow this and additional works at: http://aisel.aisnet.org/pacis2017

# Exploring Consumers' Intention to Urge to Buy in Mobile Commerce: The Perspective of Pleasure-Arousal-Dominance

*Completed Research Paper*

## Li-Ting Huang

Department of Information Management, Chang Gang University
Division of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital in Linkuo
No.259, Wenhua 1st Rd., Guishan Dist., Taoyuan City 33302, Taiwan (R.O.C.)
lthuang@mail.cgu.edu.tw

## Abstract

*Mobile services have gradually transformed and broadened, and are still being developed, bringing users more convenience, ubiquity, universality, and diversification. The mobility and ubiquity of smartphones increase users' perception of convenience, which can induce online purchases. Consumers can browse webpages on a smartphone find interesting products anywhere and anytime. They may impulsively decide to buy these products or conduct instant chats with friends to obtain product information or recommendations. It is important that we examine users' emotions when shopping via mobile devices, now that m-commerce is gradually being accepted and used, by investigating factors such as customers' perceptions of value, immersion, commitment, and pleasure. So, this study investigates consumers' urge to buy and browsing activities in m-commerce from the emotional perceptive. Findings derived from data analysis of 578 records collected from the online survey. First, the relationship of pleasure, dominance and arousal on urge to buy is demonstrated in m-commerce. Second, results show that pleasure and browsing activities are critical to inducing consumers' impulsive purchase intention in m-commerce. The total effect of pleasure on the urge to buy is close to 50%. The influence of pleasure on browsing activities is almost twice that of the urge to buy. Third, effects of web atmospherics and mobile characteristics are distinct. Web atmospherics tend to influence consumers' perceived dominance of mobile websites, thus increasing their perceived control over the interaction process. Mobile characteristics are less important to arousal and dominance. The most popular characteristics of smartphones for consumers and vendors, ubiquity and localization, do not increase consumers' perceived dominance and arousal towards mobile websites. Academic and practical implications are discussed further.*

**Keywords:** Mobile Commerce, Urge to buy, Browsing Activities, Pleasure – Arousal – Dominance, Web Atmospherics, Mobile Characteristics

## Introduction

Technical advances and the current prevalence of mobile devices such as smartphones and tablets have made mobile commerce (m-commerce) a daily necessity. Many people are gradually becoming used to purchasing physical and digital goods, making payments, browsing and searching for information, and managing personal finances on mobile devices rather than PCs or NBs. The Statista Portal (2016) reports that the number of smartphone users reached 2.08 billion in 2016, and the number of users worldwide is forecasted to be over 5 billion by 2019. Evigo (2014) report that, by 2018, m-commerce sales will almost equal all the total global e-commerce sales generated in 2013, and that global m-commerce sales will reach \$626 billion by 2018 in the United States. In Taiwan, this kind of growth is also noticeable. The emergent trend of m-commerce is especially obvious at the Double 11

festivals in China. The percentage of mobile shoppers who attend these sales festivals is between 43.7 and 48.7%, almost equal the number of traditional electronic shoppers. The percentage of mobile shoppers who attended Double 11 festivals in China in 2016 was around 82%, almost twice as many as 2014, and 1.69 times as many as 2015. Note that m-commerce can provide more value and a new business model for users than e-commerce (Chong 2013a).

Mobile services have gradually transformed and broadened, and are still being developed, bringing users more convenience, ubiquity, universality, and diversification. Consumers can browse webpages on a smartphone when riding a bus and find interesting products. They may impulsively decide to buy these products or conduct instant chats with friends to obtain product information or recommendations. Their purchases may then induce their friends' curiosity. Thus, online stores are now being required to develop dedicated websites and apps for mobile devices to attract consumers. Specific versions of webpages for mobile devices require the kinds of web atmospherics and aesthetics used in traditional electronic commerce. Characteristics of smartphone greatly enhance the exposure of mobile web pages and then consumers could easily dive into the online purchasing context. Issues related to web design for electronic commerce are popular in the literature. Web atmospherics and aesthetics are usually considered important environmental stimuli for inspiring users' cognitive and emotional processes, as well as their subsequent purchasing. The induced emotions usually trigger impulse buying. Web atmospherics focus on how the entire mobile web sites bring consumers a feeling of utilitarian and hedonic fulfillment, such as information, usability, usefulness, fun, and so on. However, few studies have examined web atmospherics, aesthetics, or impulse buying in the context of m-commerce. This may be because e-tailers have traditionally used PC versions of their webpages, and mobile devices have, until relatively recently, been limited in terms of usage and functionality.

It is important that we examine users' emotions when shopping via mobile devices, now that m-commerce is gradually being accepted and used, by investigating factors such as customers' perceptions of value, immersion, commitment, and pleasure. The linkage between web atmospherics and positive emotions has already been established in the e-commerce literature. However, few m-commerce studies have examined this issue in detail. Some studies explore users' positive emotions in terms of purchase intentions, such as trust (e.g., Sharif et al. 2014), flow (e.g., Drossos et al. 2014), and perceived enjoyment (e.g., Chong 2013a). We think users' positive emotions involve more than perceived enjoyment and flow. For example, feelings of dominance could increase users' pleasure, because users believe they are in control, and so are willing to stay on a webpage for longer. Making users feel excitement may also be important because this positive emotion can induce users' curiosity and increase their positive behaviors. Users who stay on webpages longer may behave more impulsively because they are continuously receiving environmental stimuli. The mobility and ubiquity of smartphones increase users' perception of convenience, which can induce online purchases. Wu et al. (2016) propose that web design matters to online impulse buying. We intend to answer the following research questions:

1. *What antecedents improve consumers' usage in m-commerce? Do web atmospherics and mobile characteristics induce users' intention to browse and impulse buy? What is the relative importance of web atmospherics and mobile characteristics for consumers' m-commerce usage?*

2. *What are the mediators related to positive emotions between environmental stimuli (i.e., web atmospherics and mobile characteristics) and responsive usage in m-commerce? What are the relationships among these mediators?*

We plan to answer these questions by applying a stimulus–organism–response framework (SOR), focusing on the emotional path to investigate impulse buying in m-commerce. Users immersed in m-commerce through environmental stimuli will devote themselves to activities they find and may exhibit impulse buying intentions and behavior. We consider web atmospherics and mobile characteristic as environmental stimuli. We follow the pleasure–arousal–dominance framework (PAD) proposed by Mehrabian and Russell (1974), and consider the positive emotion (i.e., PAD) as an organism. In addition to impulse buying, browsing is an important behavioral response. Users immersed in online activities will tend to stay on a webpage longer, thus receiving more environmental stimuli, which may encourage impulse buying.

# Conceptual Background and Hypotheses Development

## M-commerce

M-commerce is defined as business activities or transactions conducted via mobile equipment over wireless data communication or telecommunication networks (Zhang et al. 2012). The unique characteristics of the mobile environment induce consumers' and retailers' interests and usage. Zhang et al. (2012) state that there are several unique features of m-commerce, such as instantaneity, ubiquity, localization, personalization, and identification. Ubiquity enables users to conduct purchases anywhere, at any time, which helps them to address their needs related to purchase frequency and purchase-time irregularity (Bang et al. 2013). Ubiquity brings stores to users' handheld mobile devices, where personalized delivery service and localization allow nearby promotions to be instantly sent to users. Many activities are emerging in the mobile context, such as mobile money transfer, mobile ATM, mobile ticketing, mobile reservation, mobile vouchers, coupons and loyalty cards, content purchase and delivery, location-based services (LBS), information services, mobile banking, auctions, mobile browsing, and mobile purchases (Rani et al. 2014). Among these m-commerce activities, mobile shopping is highlighted as being a remarkable activity (Shiau and Liou 2014).

Zhang et al. (2012) analyzed various studies on the topic and found that most develop research models based on the technology acceptance model (TAM), theory of planned behavior (TPB), and diffusion of innovation (DOI). For example, some studies explore the influence of the attributes of mobile devices on their ease of use (e.g., Okazaki and Mendez 2013), perceived usefulness (e.g., Choi et al. 2014), social influence (e.g., Sim et al. 2014), trust (e.g., Sharif et al. 2014), perceived behavioral control, and subject norms (e.g., Mishra 2014). Other studies explore the intention to adopt, from the viewpoint of flow and impulse buying (e.g., Wu and Ye 2013), perceived value (Pantano and Priporas 2016), motivations (Lo et al. 2016), and the unified theory of acceptance and use of technology (UTAUT) (Chong 2013b).

## Stimulus–Organism–Response (SOR) Framework

Mehrabian and Russell (1974) proposed that a mediator between environments and human behaviors should be developed (i.e., "organismic" reactions). They suggested that the SOR framework represents the idea that when a person is exposed to external stimuli, "inner organism changes" precede behavioral responses. Individuals transform environmental cues into meaningful information, such as sensations and thoughts, and then change their emotional and cognitive states (Mehrabian and Russell 1974). The SOR framework is widely utilized in the fields of consumer behavior, retail environment, online shopping, and impulse buying (e.g., Eroglu et al. 2003; Liu et al. 2013). Most literature based on the SOR framework focuses on environmental stimuli, such as web page design (e.g., Sheng and Joginapelly 2012; Gao and Bai 2014). The study by Liu et al. (2013) was the first to use the SOR framework to explore consumers' emotional experiences in the context of m-commerce. Impulse buying is an emotional purchasing behavior. Furthermore, researchers emphasize the importance of emotional/affective processes to impulse buying (e.g., Verhagen and Van Dolen 2011). Chan et al. (2016) explore online impulse buying based on the SOR framework, and propose that two types of stimuli arouse consumers' cognition and affection, namely external and internal stimuli, as well as two types of organisms, namely cognitive and affective reactions. Shen and Khalifa (2012) explore the influence of web design on impulse buying, using the SOR paradigm. Accordingly, we also follow the emotional path in the integrated model, extended by Liu et al. (2013), to explore impulse buying behavior in terms of m-commerce.

Studies on online environments usually treat atmospheric cues as important stimuli, and focus on emotional processes. Furthermore, atmospheric cues include website quality (e.g., Koo and Ju 2010), and web aesthetics (e.g., Gao and Bai 2014). Emotional processes include pleasure, arousal, and valence (e.g., Koo and Ju 2010; Liu et al. 2013), as well as flow (Gao and Bai 2014). In particular, studies related to impulse buying emphasize the influence of the linkage between web aesthetics and emotional states on impulse buying, or the urge to buy (e.g., Floh and Madlberger 2013; Liu et al. 2013). M-commerce is an emerging trend, and needs to be explored using a framework such as the SOR framework.

## Response: Impulse Buying and the Urge to Buy

Impulse buying occurs when customers have an urge to buy a specific product without carefully considering the reasons and consequences of this purchase (Verhagen and Van Dolen 2011). When

impulse buying, customers cannot form cognitively structured attitudes or intentions, are led by their feelings, and are unable to withstand the irresistible attraction of the product. Impulse buying can also be the feeling of having an urge to buy a specific product although, in some cases, successfully resisting the temptation.

Beatty and Ferrell (1998) thought that feeling the urge to buy impulsively is a state of desire that is experienced upon encountering an object in the environment. In the context of m-commerce, Wu and Ye (2013) defined the "irresistible urge to buy" as consumers' intention to buy impulsively. Verhagen and Van Dolen (2011) showed the linkage between browsing, the urge to buy, and impulse buying, where the urge to buy is the intention to impulse buy. Accordingly, we focus on exploring the determinants of the urge to buy, rather than impulse buying, and treat the urge to buy as an intention to impulse buy.

Recently, the number of studies investigating the issues of online impulse buying has begun to increase. Parboteeah et al. (2009) show that web elements influence impulse buying, mediated by enjoyment. Wells et al. (2011) showed the direct influence of web quality on impulse buying. Verhagen and Van Dolen's (2011) study showed the influences of merchandise attractiveness, enjoyment, and the online store's communication style on impulse buying, mediated by customers' emotions. In particular, Wu and Ye (2013) first explored the issue of impulse buying in m-commerce. Although m-commerce is an extension of e-commerce, it has different characteristics. Thus, we think that the behavior of impulse buying also occurs in m-commerce, and that the determinants are distinct.

### *Stimulus: Web Atmospherics*

Dailey (2004) defined web atmospherics as the conscious designing of web environments to create positive user affect and cognition, as well as the subsequent effect of increasing favorable consumer responses, such as revisiting the site, staying for longer, browsing, and purchasing intention or information adoption. When customers feel that the website environment has good atmospherics, they will have a positive attitude toward it and visit it again, or, in the case of a shopping site, purchase from it again. Li and Yeh (2010) indicated that websites are the communication bridge between mobile vendors and customers, and that mobile retailers should develop high-quality webpages to attract potential customers and to communicate with them.

Web atmospherics is usually classified into informativeness, navigation, organization, and entertainment (e.g., Gao and Bai 2014; Hsieh et al. 2014). Informativeness refers to the extent to which an individual can expect to obtain relevant information from a webpage in order to improve decision-making (Park and Kim 2003). Navigation refers to the extent to which an individual's self-directed movements can offer freedom of selection and greater control (Hopkins and Alford 2005). Organization refers to the extent to which the guidance provided by a webpage helps the user to navigate the webpage easily and confidently (Hausman and Siekpe 2009). Entertainment refers to the attractiveness and vividness of a webpage (Richard et al. 2010).

Studies link web atmospherics to positive emotions such as enjoyment, pleasure, satisfaction, arousal, dominance, trust, and so on. For example, Floh and Madlberger (2013) showed that atmospheric cues increase users' shopping enjoyment. Li and Yeh (2010) confirmed the effect of design aesthetics on trust within the mobile internet. Sheng and Joginapelly's (2012) study demonstrated the effects of web atmospheric cues on online shopping purchase intentions through arousal and valence. Gao and Bai (2014) explored the effect of website atmospheric cues on the development of flow in the online shopping environment. In online environments, higher perceived control likely increases users' satisfaction and reduces uncertainty about product performance (Weathers et al. 2007). Therefore, well-designed web atmospherics make users feel that they have control over what they do on the website, owing to their quick adaption and short learning curves, where, otherwise, they might easily leave the website (Hsieh et al. 2014). Watson et al. (2013) stated that, in the mobile environment, consumers perceive their mobile devices to be for personal communication, and prefer to be able to exercise control over their interactions with organizations. Thus, good web design could still be important to users' sense of control in m-commerce. Empirical studies show the linkage among shopping environment atmospherics using the PAD model. If information on a website is useful, online customers will be confident of their purchase decisions because acquiring the desired information gives them a greater feeling of dominance over the online shopping process. If a website is presented well, and provides appropriate guidance, online shoppers can confidently, quickly, and easily switch across sections of the online store, and will probably enjoy the experience more (Hausman and Siekpe 2009). The navigational cues available on a website largely determine the degree of control that online customers achieve (Dailey 2004). Entertainment is also essential,

because it positively influences customers' attitudes and involvement (Richard et al. 2010). That is, website entertainment affects the arousal of online customers. Hence, we propose the following.

*H1: Web atmospherics (informativeness, navigation, perceived organization, and entertainment) are positively associated with users' perceived arousal in m-commerce.*

*H2: Web atmospherics (informativeness, navigation, perceived organization, and entertainment) are positively associated with users' perceived dominance in m-commerce.*

### Stimulus: Mobile Characteristics

Clarke (2001) defined four characteristics of m-commerce applications (ubiquity, convenience, localization, and personalization), and emphasized that these features are not found in traditional e-commerce. Studies have explored the effects of several of these characteristics on usage, or users' intentions to adopt applications. Chou et al. (2013) listed localization and personalization as the notable characteristics of mobile devices.

Localization can help providers to identify users' locations, and, thus, m-commerce providers are better able to receive and send information to users, relative to their specific location (Clarke 2001). The application of localization in m-commerce application is different from the application in e-commerce. Localization in m-commerce is usually utilized in promotion, advertising, instant information and is rooted in consumers' mobility and GPS. It could provide information happened around location where consumers are and then consumers could instantly respond to the information. But, localization in e-commerce is usually used for searching information or logistics and is basically rooted in what consumers enter into the web pages on PC, rather than GPS. Personalization can help providers to deliver personalized services and information to an individual in an m-commerce environment. Chou et al. (2013) emphasized the importance of ubiquity, where users of mobile devices have the ability to receive information and perform transactions from virtually any location in real-time. Choi et al. (2014) explored the influence of service ubiquity and location-based services (LBS) on the perceived usefulness of m-commerce. Tojib and Tsarenko (2012) confirmed the impact of service ubiquity on enjoyment, ease of use, time, convenience, and experiential value, leading to increased customer satisfaction and actual service use. Li and Du (2012) verified the effect of LBS on effective mobile advertising. Bang et al. (2013) emphasized the importance of webpage design in mobile devices, given the small size of the screens of mobile devices. They believe that a webpage for mobile devices should be less complex in terms of navigation and have high usability, decreasing the effort it takes to use application, thus, enhancing users' positive feelings (Bang et al. 2013). Bang et al. (2013) emphasized the importance of both ubiquity and spending relatively less time.

This feature solves the restrictions on the movement of e-commerce, and is more convenient when conducting m-commerce. Hence, we propose the following.

*H3: Mobile characteristics (ubiquity, convenience, localization, and personalization) are positively associated with users' perceived arousal in m-commerce.*

*H4: Mobile characteristics (ubiquity, convenience, localization, and personalization) are positively associated with users' perceived dominance in m-commerce.*

### Organism: Pleasure–Arousal–Dominance (PAD)

Mehrabian and Russell (1974) introduced three kinds of user emotions: pleasure, arousal, and dominance (PAD). The PAD model is widely used to highlight the impact of environmental cues on the emotional reactions of shoppers (Hsieh et al. 2014). The definition of pleasure is "the degree to which a person feels good, happy, blessed, or satisfied" (Eroglu et al. 2003). Arousal refers to the degree of sensory stimulation, energy, or excitement (Eroglu et al. 2003). Dominance refers to the degree to which a person is influenced or controlled by the environment (Mehrabian and Russell, 1974). The PAD model has begun to be applied to the online shopping environment (Hsieh et al. 2014). Several studies demonstrate that PAD emotions positively influence the behaviors of online shoppers (e.g., Ha and Lennon 2010). However, there is still no application of PAD in the context of m-commerce. Li et al. (2011) explored the antecedents and consequences of positive emotion in m-commerce, but not as they relate to web aesthetics and the PAD model.

Studies have demonstrated that pleasure mediates the link between arousal, dominance, and shopping behavior, and exerts a positive influence on shopping behavior (Ding and Lin 2012). The perceived dominance of online customers increases their sense of pleasure (Eroglu et al. 2003).

Researchers usually explore the relationship between web atmospherics and the PAD model, based on the SOR framework (e.g., Chang et al. 2014; Hsieh et al. 2014). Zhang et al. (2014) confirmed the linkage among environmental stimulus, emotions, and behaviors in the field of impulse buying. Chang et al. (2014) examined the relationship between consumers' emotional models and their behavioral intentions to purchase immediately from the perspective of web aesthetics. Various studies have shown that positive emotions, such as pleasure, arousal, shopping enjoyment, and instant gratification, influence consumers' urge to buy impulsively (e.g., Floh and Madlberger 2013; Liu et al. 2013). However, few studies have explored consumers' purchase or impulse-buying behaviors in the context of m-commerce. Ding and Lin (2012) showed that pleasure mediates the link between arousal and dominance. Online customers' perceived dominance increases their sense of pleasure (Eroglu et al. 2003). In online environments, higher perceived control likely increases users' satisfaction and reduces their uncertainty about product performance (Weathers et al. 2007). Hsieh et al. (2014) showed that perceived dominance indirectly affects purchasing intentions through pleasure. In the mobile environment, Watson et al. (2013) stated that consumers perceive their mobile devices to be for personal communication, and prefer to be able to exercise control over their interactions with organizations. If users perceive a sense of control, excitement, and energy, they are more likely to remain and enjoy the interaction process. Hence, we propose the following.

> *H5: Users' perceived arousal is positively associated with their perceived pleasure in m-commerce.*

> *H6: Users' perceived dominance is positively associated with their perceived pleasure in m-commerce.*

Studies have demonstrated that pleasure exerts a positive influence on shopping behavior (Ding and Lin 2012). Verhagen and Van Dolen's (2011) study showed that emotion increases the browsing behavior of consumers. Empirical studies have demonstrated that consumers with high shopping enjoyment tend to browse for longer and, thus, feel a stronger urge to buy impulsively (Chavosh et al. 2011). Chavosh et al. (2011) showed that perceived enjoyment simultaneously increases users' browsing and impulse-buying behavior. Badgaiyan and Verma's (2014) study concluded that both enjoyment and browsing increase consumers' impulse-buying behavior. Thus, if users feel pleasure and arousal when they are shopping in a store, they will enjoy exploring it, and will exhibit approach behaviors (Vieira 2013). Hence, we propose the following.

> *H7a: Users' perceived pleasure is positively associated with their browsing behavior in m-commerce.*

> *H7b: Users' perceived pleasure is positively associated with their urge to buy in m-commerce.*

### *Response: Browsing*

Janiszewski (1998) described two types of consumer information-gathering behaviors: goal-directed and explorative search activities. An explorative search does not actively seek information, and is less focused and stimulus-driven (Janiszewski, 1998). Moe (2003) defined explorative search activities as "browsing." If consumers browse for longer, they will encounter more stimuli, which increase the likelihood of impulse buying (Park et al. 2012). Beatty and Ferrell (1998) found that browsing activities increase the opportunities for exposure to extrinsic stimuli in a store (e.g., promotions or new products), leading to positive feelings and the urge to buy, thus increasing the possibility of impulse buying. Moe (2003) indicated a relationship between hedonic browsing activities and impulse buying. Shen et al. (2010) indicated that most consumers spend a lot of time looking at products, rather than buying them, and demonstrated that browsing activities have a positive influence on unplanned purchases in the online shopping environment. Floh and Madlberger (2013) emphasized that browsing does not always lead to purchasing, because browsing is recreationally motivated. This is supported by Verhagen and Van Dolen (2011), who found that consumers' in-store browsing behavior is for recreational, not informational, purposes and there is not always an immediate intent to buy.

The influence of browsing activities on online impulse buying is examined in various studies. The mediating role of browsing between positive emotion and purchase intention, or the urge to buy impulsively, has been demonstrated in empirical studies such as those of Chavosh et al. (2011), Verhagen and Van Dolen (2011), and Badgaiyan and Verma (2014). Empirical studies have demonstrated that consumers with high shopping enjoyment tend to browse for longer and, thus, are expected to feel stronger urges to buy impulsively (Chavosh et al. 2011). This relationship also exists in the online context. Verhagen and Van Dolen's (2011) study showed that emotion increases the

browsing behavior of consumers, which, in turn, induces a general urge to buy impulsively. Amos et al. (2014) also demonstrated that browsing behaviors affect impulse buying, using a meta-analysis of consumers' impulse-buying behaviors. In addition, studies have demonstrated that shopping enjoyment directly induces impulsive-buying behaviors (e.g., Chavosh et al. 2011). Badgaiyan and Verma's (2014) study concludes that both enjoyment and browsing increase consumers' impulse-buying behaviors. Chong (2013b) emphasized that m-commerce provides users with interactions, usage patterns, and value chains that differ from those of e-commerce. Accordingly, we explore this issue in the context of m-commerce.

*H8: Users' browsing behavior is positively associated with their urge to buy.*

The research model is shown in Figure 1.



**Figure 1. Research Framework**
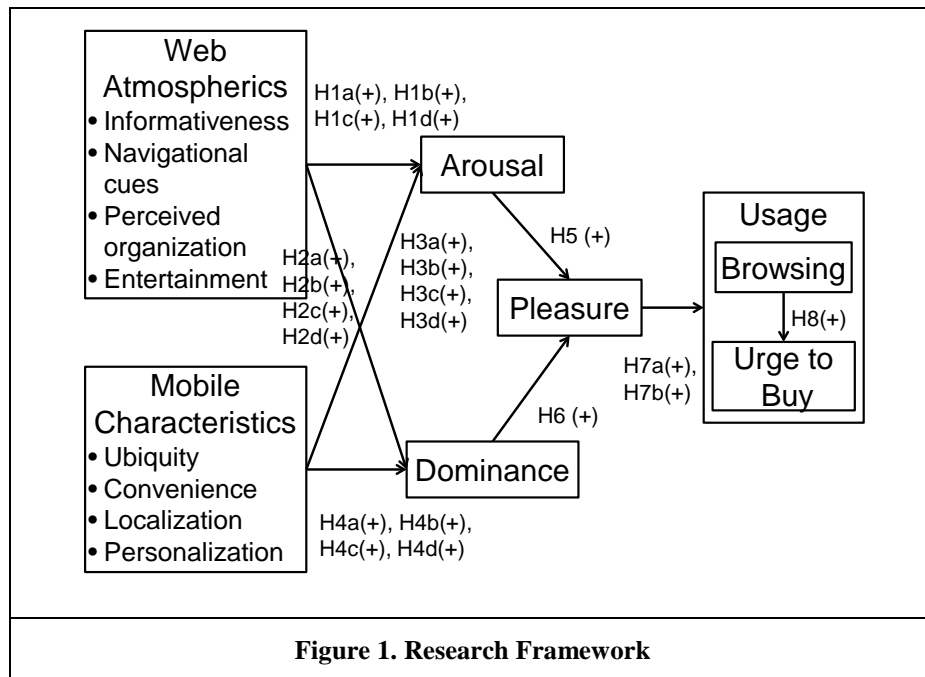
# Research Method

## *Operationalization and Instrument Design*

The instruments for the constructs were adapted and from the literature to fit our research context. All items are presented using seven-point Likert-type scales, ranging from strong disagreement to strong agreement. The operational definitions are shown in Table 1. A short interview with several colleagues and experts and a pre-test were carried out to ensure the face validity and content validity of the questionnaires. Cronbach's Alpha test was conducted to ensure the reliability of the data collected from the pre-test. Cronbach's Alpha of all constructs was above 0.7.

| Table 1. Operationalization for Constructs and Numbers of Measurement Items | |
|---|---|
| Construct | Definition |
| Ubiquity | The extent to which an individual has the ability to receive information and perform transactions from virtually any location and in real-time from a mobile device (Chou et al. 2013). |
| Localization | The extent to which an individual can use mobile devices through GPS technology to determine their location (Chou et al. 2013). |
| Personalization | The extent to which an individual can receive personalize services and information for a single individual from service providers through a mobile device (Chou et al. 2013). |
| Convenience | The agility, accessibility and availability of a service, which is flexible in terms of |

| | |
|---|---|
| | time and location (Okazaki & Mendez 2013). |
| Informativeness | The extent to which an individual expects to obtain relevant information from web pages in order to improve decision-making (Park & Kim 2003). |
| Navigational cues | The extent to which an individual's self-directed movements offer freedom of selection and greater control (Hopkins & Alford 2005) |
| Web organization | The extent to which appropriate guidance helps users to easily and confidently move around sections of web pages (Hausman & Siekpe 2009). |
| Entertainment | The attractiveness and vividness of web pages (Richard et al. 2010). |
| Arousal | The extent of sensory stimulation, energy, or excitement (Eroglu et al. 2003). |
| Dominance | The extent to which an individual is influenced or controlled by the environment (Mehrabian & Russell 1974). |
| Pleasure | The extent to which an individual feels good, happy, blessed, or satisfied (Eroglu et al. 2003). |
| Browsing Activity | The extent to which an individual performs explorative search activities on a mobile web site (Moe 2003). |
| Urge to buy | An individual's desire to make unintended and immediate purchases when encountering an object in the environment (Beatty & Ferrell 1998). |

**Table 1. Operationalization for Constructs and Numbers of Measurement Items**

## Data Collection

This study employs an online questionnaire for data collection. We focus on respondents who have smart phones, as well as experience in adopting mobile services and electronic online shopping. We asked respondents to list three m-commerce web sites that they visit or purchase from frequently. Respondents were asked to choose one of these as a basis for their answers to the questionnaire. Based on their perceptions and feelings about the target website, respondents answer measurement questions about perceived mobile characteristics (ubiquity, localization, personalization, and convenience), perceived web atmospherics (informativeness, navigational cues, web organization, and entertainment), positive emotions they feel while visiting the website (arousal, dominance, and pleasure), browsing activities, and their perceived urge to buy products on offer. Finally, respondents describe the percentage and possibility distribution of browsing and their urge to buy.

The survey was uploaded to survey forums and sweepstakes forums on virtual communities. Participants were self-selected for this study via the posted messages. A sweepstake was held to increase survey responses. We eliminate duplicate responses by identifying and removing duplicate e-mail addresses from our database. Over three weeks, 578 records were identified for data analysis.

# Data Analysis and Results

## Measurement Model

The measurement model is assessed using a confirmatory factor analysis and SmartPLS 3.0. The factors loadings of the indicators are all above the acceptable level of 0.6 and are significant ($p \leq 0.01$), ranging from 0.77 to 0.96. This reveals the acceptance of construct validity.

The reliability and convergent validity are acceptable, as compared with the thresholds suggested by Bagozzi (1980) of 0.7 and 0.5, respectively. The composite reliability ranges from 0.84 to 0.96, and the average variance ranged from 0.6 to 0.91. The discriminant validity is acceptable based on the rule that the correlations between any two distinct constructs are lower than the square root of the average variance extracted of the constructs (Fornell and Larcker, 1981).

## Hypotheses Testing

The model is analyzed using a structural equation model (SEM) with SmartPLS 3.0. The results show that H2, H5, H6, H7, andH8 are supported. H1 and H3 are partially supported and H4 is not supported. The associations among arousal, pleasure, dominance, browsing activities, and urge to buy exist as we expect, after excluding the influence of impulsiveness on urge to buy. The relationships of the four web atmospherics and dominance are all supported. Among the relationships of web

atmospherics and arousal, only the associations of perceived organization and entertainment with arousal are significant, while the negative relationship of perceived organization and arousal is contrary to our expectation. Among the relationships of mobile characteristics and arousal, only the association of convenience, personalization, and arousal are significant (H3b and H3d). Thus, web atmospherics are usually related to consumers' perceived dominance, while mobile characteristics are more related to consumers' perceived arousal. The explained variance of arousal, dominance, pleasure, browsing activities, and urge to buy are all acceptable: 47%, 54%, 58%, 36%, and 56%, respectively. The fit index of the research model, the standardized root mean square residual (SRMR), is 0.08, and is acceptable compared with the threshold suggested by Hu and Bentler (1999) of 0.08 to 0.10. Henseler et al. (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM as a way to avoid model misspecification.



**Figure 2: Structural Model – Main Effect (H1~H8)**
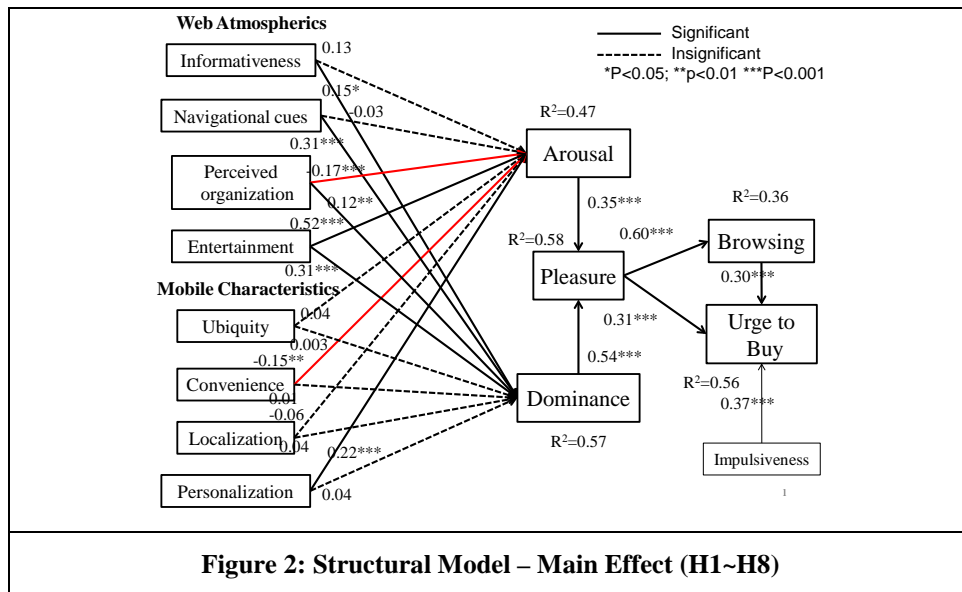
# Discussion and Implication

## Conclusions

This study explores consumers' urge-to-buy intention in m-commerce. Four main findings are drawn from the results.

**First**, the results confirm the appropriateness of applying the PAD and the influences of PAD on the urge to buy. Dominance and arousal influence browsing activities and urge to buy through pleasure. Moreover, the high explained variance of pleasure (58.4%) shows that dominance and arousal are critical to pleasure. Consumers are happy if they are stimulated and excited, as well as when they have control over the interaction process and what they want to see when visiting mobile websites. **Second**, the total effect of pleasure on the urge to buy is close to 50% (48.9%), showing that pleasure is critical to inducing consumers' impulsive purchase intention in m-commerce. This includes the direct effect, 0.309, and the indirect effect through consumers' browsing activities on mobile web sites, 0.180. In addition, the influence of pleasure on browsing activities is almost twice that of the urge to buy, after excluding the effect of impulsiveness on the urge to buy. **Third**, the effects of the four features of web atmospherics are distinct. Web atmospherics tend to influence consumers' perceived dominance of mobile websites, thus increasing their perceived control over the interaction process. Here, perceived organization and entertainment affect consumers' perceived dominance and arousal, while informativeness and navigation cues affect perceived dominance only. Interestingly, the perceived organization of webpages has a negative influence on consumers' perceived arousal. This may be due to well organized web pages not providing a surprise element for consumers. Therefore, consumers may feel that the ordered structure is controlled by the vendor, making it predictable and boring. It is noticeable that entertainment is critical to consumers' perceived arousal and dominance. The interesting, enjoyable, and fun interaction process when visiting mobile web sites can evoke consumers' positive feelings and browsing activities, increasing their intention to buy impulsively. **Fourth**, mobile characteristics are less important to arousal and dominance. The four mobile characteristics (ubiquity, convenience, localization, personalization) do not influence consumers'

perceived dominance. Only convenience and personalization influence consumers' perceived arousal. The most popular characteristics of smartphones for consumers and vendors, ubiquity and localization, do not increase consumers' perceived dominance and arousal towards mobile websites. Consumers may be used to mobile characteristics and think these are natural and common to smartphones. It is also possible that current mobile web sites do not really demonstrate mobile characteristics, in which case, consumers are not impressed by mobile characteristics on mobile web sites. Personalization positively influences consumers' perceived arousal. Consumers are stimulated and feel excited when they see personalized information on mobile web sites. Convenience negatively influences consumers' perceived arousal. This result is contrary to our expectation. A possible explanation may be the commonality of convenience among all smartphones. Convenience is a necessary condition, rather than a sufficient condition. If a smartphone is inconvenient, consumers will not use it.

## *Academic Implications*

There are three academic implications of our findings. **First**, this study explores the linkages among environmental stimuli (i.e., web atmospherics and mobile characteristics), positive emotional processes (i.e., arousal, control, and pleasure), and users' responses (i.e., the urge to buy and browse) by examining the specific features of m-commerce, based on the stimulus–organism–response (SOR) framework and the pleasure–arousal–dominance (PAD) model of m-commerce. Most m-commerce research is based on TAM, TPB, or DOI. Some studies focus on aspects of user affect, such as flow, trust, enjoyment, or pleasure. We focus on users' urge to buy, employing the pleasure–arousal–dominance (PAD) model. The model is usually applied to web design settings in e-commerce, rather than m-commerce. The results also show the appropriateness of the PAD model and SOR framework to m-commerce. In addition to pleasure, dominance and arousal are important to users. Users may enjoy the interactive process if they are excited and feel confident using webpages on their mobile devices. **Second**, we consider mobile characteristics and web atmospherics as environmental stimuli. Mobile characteristics are important facilitators of m-commerce. Features specific to the mobile context imply new usage patterns, services, and business models, making traditional e-commerce web design principles less appropriate to m-commerce. This study explores the importance of web atmospherics and mobile characteristics, and determines which features are important. The results show that web atmospherics, including informativeness, navigation cues, perceived organization, and entertainment, are important to consumers' perceived dominance over mobile web sites. However, mobile characteristics do not seem important to m-commerce, because they are relatively commonplace for consumers. However, personalization increases consumers' perceived excitement. **Third**, we emphasize the importance of browsing in social commerce. Users can use mobile devices at any time and may stop when they find something else to do. It is important to keep users on webpages for longer and then induce the urge to buy. Results show that browsing activities significantly increase the probability of buying. In addition, the influence of pleasure on browsing is almost twice that of its influence on the urge to buy. Thus, pleasure directly and indirectly affects consumers' impulsive purchases through browsing activities.

## *Managerial Implications*

Our findings lead to the following suggestions for managers. **First**, e-tailers in m-commerce could utilize the results to redesign their webpages and service processes to inspire users' positive emotions. Navigation cues and entertainment are both important features that induce consumers' perceived autonomy of the interactive process with mobile web sites. Providing useful and rich information and appropriate guidance on webpage structures are important to improving consumers' perceived autonomy. Entertainment not only induces consumers' perceived dominance, but also perceived arousal. When consumers feel happy and have fun during interaction, they browse websites more easily, and in a relaxed way. However, perceived organization decreases consumers' arousal. The influence of the domain on pleasure is much greater than the influence of arousal. Accordingly, e-tailers in m-commerce should be careful to provide well-structured and predictable webpages. **Second,** ubiquity and localization do not seem to induce positive emotions. Personalization could enhance consumers' perceived arousal, but has no significant effect on perceived dominance. Thus, e-tailers could pay more attention to providing customized notifications and information to consumers, even integrating characteristics of ubiquity and localization into personalized services fulfilling consumers' specific requirements, Convenience decrease consumers' perceived arousal. E-tailers in m-commerce may need to provide convenience services beyond the standard features of smartphones. **Third**, in m-commerce, instant gratification is important to inducing users' intention to impulse buy

(or urge to buy), including through arousal and pleasure. Users' perceived control during the interactive process is also important to increasing their pleasure. Accordingly, e-tailers in m-commerce should give users shopping hints, without manipulation, and embed pleasurable surprises. E-tailers should also try to understand users' preferences, and provide well-designed webpages, autonomous operations, and interesting interactive activities. **Fourth**, browsing activities could be a determinant of consumers' urge to buy. Consumers feeling pleasure often enjoy browsing webpages more than buying something. The literature indicates that browsing leads to impulse buying because of the exposure to environmental stimuli. Accordingly, e-tailers in m-commerce could try to prolong user visits to their websites by providing interesting content, thus, increasing the likelihood of impulsive purchases.

# References

Amos, C., Holmes, G. R., and Keneson, W. C. 2014. "A Meta-Analysis of Consumer Impulse Buying," *Journal of Retailing and Consumer Services* (21:2), pp. 86–97.

Badgaiyan, A. J., and Verma, A. 2014. "Intrinsic Factors Affecting Impulsive Buying Behaviour—Evidence from India," *Journal of Retailing and Consumer Services* (21:4), pp. 537–549.

Bagozzi, R.P. and Yi, Y. 1988. "On the Evaluation of Structural Equation Models," *Academy of Marketing Science* (16 :1), pp. 74–94.

Bang, Y., Han, K., Animesh, A., and Hwang, M. 2013. "From Online to Mobile: Linking Consumers' Online Purchase Behaviors with Mobile Commerce Adoption," *PACIS 2013 Proceedings*.

Beatty, S.E., and Ferrell, M.E. 1998. "Impulse Buying: Modeling its Precursors," *Journal of Retailing* (74:2), pp. 169–191.

Chan, T.K.H., Cheung, C.M.K, and Leeb, Z.W.Y. 2016. "The State of Online Impulse-Buying Research: A Literature Analysis," *Information & Management*. http://dx.doi.org/10.1016/j.im.2016.06.001.

Chang, S. H., Chih, W. H., Liou, D. K., and Hwang, L. R. 2014. "The Influence of Web Aesthetics on Customers' PAD," *Computers in Human Behavior* (36), 168–178.

Chavosh, A., Halimi, A. B., Namdar, J., Choshalyc, S. H., and Abbaspour, B. 2011. "The Contribution of Product and Consumer Characteristics to Consumer's Impulse Purchasing Behaviour in Singapore," in *Proceedings of International Conference on Social Science and Humanity*, Singapore: IACSIT Press, pp. 248–252.

Choi, S., Cheong, K., Somera, B., and Hao, Q. 2014. "Determinants of Utilitarian Value in Smartphone-Based Mobile Commerce," *PACIS 2014 Proceedings*.

Chong, A. Y. L. 2013a. "Mobile Commerce Usage Activities: The Roles of Demographic and Motivation Variables," *Technological Forecasting and Social Change* (80:7), pp. 1350–1359.

Chong, A. Y. L. 2013b. "Predicting M-Commerce Adoption Determinants: A Neural Network Approach," *Expert Systems with Applications* (40:2), pp. 523–530.

Chou, C. H., Chiu, C. H., Ho, C. Y., and Lee, J. C. 2013. "Understanding Mobile Apps Continuance Usage Behavior and Habit: An Expectance–Confirmation Theory," *PACIS 2013 Proceedings*.

Clarke, I. 2001. "Emerging Value Propositions For M-Commerce," *Journal of Business Strategies* (18:2), pp. 133–148.

Dailey, L. 2004. "Navigational Web Atmospherics: Explaining the Influence of Restrictive Navigation Cues," *Journal of Business Research* (57:7), pp. 795–803.

Ding, C. G., and Lin, C. H. 2012. "How Does Background Music Tempo Work for Online Shopping?" *Electronic Commerce Research and Applications* (11:3), pp. 299–307.

Drossos, D. A., Kokkinaki, F., Giaglis, G. M., and Fouskas, K. G. 2014. "The Effects of Product Involvement and Impulse Buying on Purchase Intentions in Mobile Text Advertising," *Electronic Commerce Research and Applications*0 (13:6), pp. 423–430.

Eroglu, S.A., Machleit, K.A., and Davis, L.M. 2003. "Empirical Testing of a Model of Online Store Atmospherics and Shopper Responses," *Psychology & Marketing* (20:2), pp. 139–150.

Evigo 2014. "Goldman Sachs: M-Commerce Sales Forecast to Hit $626 Billion by 2018," http://evigo.com/12038-goldman-sachs-m-commerce-sales-forecast-hit-626-billion-2018/, modified by 2014/3/12.

Floh, A., and Madlberger, M. 2013. "The Role of Atmospheric Cues in Online Impulse-Buying Behavior," *Electronic Commerce Research and Applications* (12:6), pp. 425–439.

Fornell, C. and Larcker, D.F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (36:10), pp. 1246–1255.

Gao, L., and Bai, X. 2014. "Online Consumer Behaviour and its Relationship to Website Atmospheric Induced Flow: Insights into Online Travel Agencies in China," *Journal of Retailing and Consumer Services* (21:4), pp. 653–665.

Ha, Y., and Lennon, S. J. 2010. "Online Visual Merchandising (VMD) Cues and Consumer Pleasure and Arousal: Purchasing Versus Browsing Situation," *Psychology & Marketing* (27:2), pp. 141–165.

Hausman, A. V., and Siekpe, J. S. 2009. "The Effect of Web Interface Features on Consumer Online Purchase Intentions," *Journal of Business Research* (62:1), pp. 5–13.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., and Calantone, R. J. 2014. "Common Beliefs and Reality about Partial Least Squares: Comments on Rönkkö & Evermann (2013)," *Organizational Research Methods* (17 :2): 182–209.

Hopkins, C. D., and Alford, B. L. 2005. "Pioneering the Development of a Scale to Measure E-Tailer Image," *Journal of Internet Commerce* (4:4), pp. 77–99.

Hsieh, J. K., Hsieh, Y. C., Chiu, H. C., and Yang, Y. R. 2014. "Customer Response to Web Site Atmospherics: Task-Relevant Cues, Situational Involvement and PAD," *Journal of Interactive Marketing* (28:3), pp. 225–236.

Janiszewski, C. 1998. "The Influence of Display Characteristics on Visual Exploratory Search Behavior," *Journal of Consumer Research* (25:3), pp. 290–301.

Koo, D. M., and Ju, S. H. 2010. "The Interactional Effects of Atmospherics and Perceptual Curiosity on Emotions and Online Shopping Intention," *Computers in Human Behavior* (26:3), pp. 377–388.

Li, K., and Du, T. C. 2012. "Building a Targeted Mobile Advertising System for Location-Based Services," *Decision Support Systems* (54:1), pp. 1–8.

Li, M., Dong, Z. Y. & Chen, X. 2011. "Factors Influencing Consumption Experience of Mobile Commerce: A Study From Experiential View," *Internet Research* (22:2), pp. 120–141.

Li, Y. M., and Yeh, Y. S. 2010. "Increasing Trust in Mobile Commerce Through Design Aesthetics," *Computers in Human Behavior* (26:4), pp. 673–684.

Liu, Y., Li, H., and Hu, F. 2013. "Website Attributes in Urging Online Impulse Purchase: An Empirical Investigation on Consumer Perceptions," *Decision Support Systems* (55:3), pp. 829–837.

Lo, L. Y. S., Lin, S. W., and Hsu, L. Y. 2016. "Motivation for Online Impulse Buying: A Two-Factor Theory Perspective," *International Journal of Information Management* (36:5), pp. 759–772.

Mehrabian, A., and Russell, J. A. 1974. *An Approach to Environmental Psychology*. The MIT Press.

Mishra, S. 2014. "Adoption of M-Commerce in India: Applying Theory of Planned Behaviour Model," *Journal of Internet Banking and Commerce* (19:1), pp. 1–17.

Moe, W. W. 2003. "Buying, Searching, or Browsing: Differentiating Between Online Shoppers Using In-Store Navigational Clickstream," *Journal of Consumer Psychology* (13:1), pp. 29–39.

Okazaki, S., and Mendez, F. 2013. "Exploring Convenience in Mobile Commerce: Moderating Effects of Gender," *Computers in Human Behavior* (29:3), pp. 1234–1242.

Pantano, E., and Priporas, C. V. 2016. "The Effect of Mobile Retailing on Consumers' Purchasing Experiences: A Dynamic Perspective," *Computers in Human Behavior* (61), pp. 548–555.

Parboteeah, D. V., Valacich, J. S., and Wells, J. D. 2009. "The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively," *Information Systems Research* (20:1), pp. 60–78.

Park, C. H., and Kim, Y. G. 2003. "Identifying Key Factors Affecting Consumer Purchase Behavior in an Online Shopping Context," *International Journal of Retail & Distribution Management* (31:1), pp. 16–29.

Park, E. J., Kim, E. Y., Funches, V. M., and Foxx, W. 2012. "Apparel Product Attributes, Web Browsing, and E-Impulse Buying on Shopping Websites," *Journal of Business Research* (65:11), pp. 1583–1589.

Rani, P., ShriVastav, N., and Kumar, D. 2014. "Mobile-Commerce," *International Journal of Research* (1:7), pp. 71–79.

Richard, M. O., Chebat, J. C., Yang, Z., and Putrevu, S. 2010. "A Proposed Model of Online Consumer Behavior: Assessing the Role of Gender," *Journal of Business Research* (63:9), pp. 926–934.

Sharif, M. S., Shao, B., Xiao, F., and Saif, M. K. 2014. "The Impact of Psychological Factors on Consumers Trust in Adoption of M-Commerce," *International Business Research* (7:5), pp. 148–155.

Shen, K. N., and Khalifa, M. 2012. "System Design Effects on Online Impulse Buying," *Internet Research* (22:4), pp. 396–425.

Shen, Y. C., Chu, C. H., Chiang, C. C., and Huang, H. M. 2010. "Exploring the Personal and Situational Antecedents of the Internet Unplanned Purchase Behavior," *Journal of e–Business* (12:3), pp. 457–482.

Sheng, H., and Joginapelly, T. 2012. "Effects of Web Atmospheric Cues on Users' Emotional Responses in E-Commerce," *AIS Transactions on Human-Computer Interaction* (4:1), pp. 1–24.

Shiau, W. L., and Liou, T. R. 2014. "Understanding the Effects of Consumers' Value Technology Fit on a Mobile Shopping Website: The Case of Rakuten Ichiba," *PACIS 2014 Proceedings*.

Sim, J. J., Tan, G. W. H., Wong, J. C. J., Ooi, K. B, and Hew, T. S. 2014. "Understanding and Predicting the Motivators of Mobile Music Acceptance – A Multi-Stage MRA-Artificial Neural Network," *Telematics and Informatics* (31), pp. 569–584.

The Statista Portal. 2016. "Number of Smartphone Users Worldwide From 2014 to 2019: In Millions," Retrieved from http://www.statista.com/statistics/330695/number-of-martphone-users-worldwide/.

Tojib, D., and Tsarenko, Y. 2012. "Post-Adoption Modeling of Advanced Mobile Service Use," *Journal of Business Research* (65:7), pp. 922–928.

Verhagen, T., and Van Dolen, W. 2011. "The Influence of Online Store Beliefs on Consumer Online Impulse Buying: A Model and Empirical Application," *Information & Management* (48:8), pp. 320–327.

Vieira, V. A. 2013. "Stimuli-Organism-Response Framework: A Meta-Analytic Review in the Store Environment," *Journal of Business Research* (66:9), pp. 1420–1426.

Watson, C., McCarthy, J., and Rowley, J. 2013. "Consumer Attitudes Towards Mobile Marketing in the Smart Phone Era," *International Journal of Information Management* (33:5), pp. 840–849.

Weathers, D., Subhash S., and Wood, S. L. 2007. "Effects of Online Communication Practices on Consumer Perceptions of Performance Uncertainty for Search and Experience Goods," *Journal of Retailing* (83:4), pp. 393–401.

Wells, J. D., Parboteeah, V., and 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), pp. 32–56.

Wu, L., Chen, K. W., and Chiu, M. L. 2016. "Defining Key Drivers of Online Impulse Purchasing: A Perspective of both Impulse Shoppers and System Users," *International Journal of Information Management* (36:3), pp. 284–296.

Wu, Y. L., and Ye, Y. S. 2013. "Understanding Impulsive Buying Behavior in Mobile Commerce," *PACIS 2013 Proceedings*.

Zhang, K. Z., Hu, B., and Zhao, S. J. 2014. "How Online Social Interactions Affect Consumers' Impulse Purchase on Group Shopping Websites?" *PACIS 2104 Proceedings*.

Zhang, L., Zhu, J., and Liu, Q. 2012. "A Meta-Analysis of Mobile Commerce Adoption and the Moderating Effect of Culture," *Computers in Human Behavior* (28:5), pp. 1902–1911.