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# Roles of perceived value and individual differences in the acceptance of mobile coupon applications

Perceived  
value and  
individual  
differences

471

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## Abstract

**Purpose** – The purpose of this paper is to examine how consumers' value evaluation and personality factors influence consumers' intention to adopt mobile coupon (M-coupon) applications in China. The moderating effect of gender on the relationships between personality factors and consumers' adoption intention is also tested.

**Design/methodology/approach** – This study conducted a survey to collect data from M-coupon application users. In total, 271 valid responses were analyzed using structural equation modeling (SEM) technology.

**Findings** – The results indicate that perceived value, personal innovativeness, and coupon proneness positively affect consumers' acceptance of M-coupon applications. Personal innovativeness has more positive impact on behavioral intention for males than for females. However, the differential effects of coupon proneness on behavioral intention are not significant between males and females. In addition, the findings show that perceived convenience, perceived enjoyment, and perceived money savings positively influence perceived value, whereas perceived fees and perceived privacy risk negatively influence it.

**Practical implications** – This study helps M-coupon application providers to identify who is positive toward their services and how to improve consumers' perceived value of the services, eventually expanding their user base.

**Originality/value** – Prior studies mainly focussed on the usage behavior of M-coupons and overlooked the important role of M-coupon applications in promoting M-coupon use. This research fills this gap. The research findings offer insights into the factors influencing consumers' behavioral intention to adopt M-coupon applications. Besides, the results of gender's moderating effect advance the understanding of the differences in males' coupon usage intentions between the contexts of M-coupon applications and paper-based coupon services, which enrich couponing research.

**Keywords** Consumer marketing, Consumer behaviour, Technological innovation, Customer service, Marketing channels, Mobile communication systems

**Paper type** Research paper



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## 1. Introduction

The development of mobile communication technologies has impelled various types of mobile services to be widely used by mobile subscribers (Zhou, 2011). However, mobile marketing service such as mobile couponing is still in its infancy. Though the initial obstacle of entry to mobile couponing was technology, now the challenge turns to consumers' adoption of mobile coupons (M-coupons) (Jayasingh and Eze, 2010). For example, the actual acceptance and use of M-coupons is not yet popular in the USA (Im and Ha, 2012). In China, M-coupon marketing is also in the stage of accumulating users. With the extensive use of smartphones, a new mobile couponing service called M-coupon application has emerged to accelerate the use of M-coupons. This application runs on smartphones and integrates merchants' M-coupons for consumers to use coupons conveniently. It has been reported that M-coupon applications have increased the number of M-coupon users in 2013 (Juniper Research, 2013). In addition, M-coupon applications are closed loop coupon systems that help to collect data on offline purchases. With such a significant commercial value, M-coupon applications have received considerable attentions from many firms. For instance, RetailMeNot.com, one of the known coupon sites in the USA, issued the latest version of the M-coupon application for Android Phones and iPhone in 2013. Target joined its M-coupon application to the Passbook which regarded couponing as one of the most important functionalities in 2012. Walgreens became an adopter, supporting mobile couponing directly from their mobile application in 2012. M-coupon applications also gained the interest of practitioners in China. For example, Alibaba, the largest internet Company in China, has invested two rounds of funds in a local living service provider to develop its M-coupon application, namely, DDCoupon. Tencent, one of China's largest integrated internet service providers, has invested considerable funds and resources to develop M-coupon applications. Sufficient user acceptance of M-coupon applications is critical for firms to advance M-coupon usage and gain revenues from their investments. However, a survey report issued by iResearch, a leading internet consulting firm in China, showed that M-coupon application was one of the popular life service applications, but only 9 percent of smartphone users had used it in China by the end of May 2013 (iResearch, 2013). This indicates that the adoption rate of M-coupon applications is low in China.

In the academic field, scholars have mainly focussed on M-coupon adoption and direct usage (Dickinger and Kleijnen, 2008; Hsu *et al.*, 2006; Im and Ha, 2012, 2013; Jayasingh and Eze, 2009, 2010, 2012) and ignored important roles of M-coupon applications in promoting M-coupon use. It is worth noting that differences exist between M-coupon adoption and M-coupon application adoption. The main reason is that M-coupon application is different from M-coupon. While M-coupon refers to electronic coupon executed on mobile phones (Jayasingh and Eze, 2009), M-coupon application is a new service that provides M-coupons for consumers. It contains multiple functions related to M-coupon usage, such as searching coupons, finding near-location coupons, storing coupons, and sharing coupons. In order to make a clear understanding of M-coupon application, Appendix 2 shows two snapshots of the DDCoupon application's interface. Since the M-coupon and M-coupon application are different, consumers may have different perceptions and adoption intentions toward them. Thus, the reason why smartphone users are willing or unwilling to use M-coupon applications is worth exploring. This research attempts to investigate this problem.

Dianping, a couponing application in China, has been downloaded more than 40 million times in 2012, which indicated that China's mobile couponing adoption has

significantly increased over the past year (Juniper Research, 2013). Therefore, China is an appropriate place to conduct such an investigation. The current study will explore the factors affecting the acceptance of M-coupon applications using data collected from China.

Prior research has extensively used information technology (IT) adoption theories to investigate the adoption behavior of mobile services, and regarded adopters as technology users. However, Kim *et al.* (2007b) considered that explaining users' behavior of mobile service from the perspective of technology users is not enough. The adopters of new Information and Communication Technology (ICT) are service consumers rather than simple technology users. Thus, a more in-depth investigation of mobile service adoption from the consumers' perspective is necessary. Some researchers have done this by using perceived value, which is extensively used in the field of marketing, to predict mobile users' adoption behavior and the validity of perceived value has been empirically examined (Kim *et al.*, 2007b; Kleijnen *et al.*, 2007). Other researchers have incorporated three constructs, namely hedonic motivation, price value and habit, into the unified theory of acceptance and use of technology (UTAUT), which is an integrative model of eight IT use theories/models, to develop a new model – UTAUT2 (Venkatesh *et al.*, 2012). Using a survey of users, the researchers have also provided empirical evidence to support the usability of UTAUT2 in the mobile internet context. Given that using M-coupon applications is closely linked with purchasing, users may incline to make a decision to adopt such service from the perspective of consumers. Previous research showed that coupon usage is determined by the trade-off measure between benefits and costs of coupon redemption (Hyunmo *et al.*, 2006). Furthermore, a research also pointed out that the success of mobile couponing depends on offering value propositions to gain consumers (Shankar *et al.*, 2010). As evidenced by these studies, we may conclude that perceived value plays important role in coupon promotion and it is an important antecedent variable for consumers to accept M-coupon applications. Thus, this study focusses on the predictive effect of perceived value instead of UTAUT2 as the theoretical base on consumers' adoption of M-coupon applications. Nevertheless, perceived value does not entirely explain mobile consumers' behavior. Consumers' behavior may also be affected by other factors, such as individual differences. The significant influence of individual differences on information systems (IS) using decisions has been constantly discussed (Lee *et al.*, 2007). To fully understand consumers' acceptance of M-coupon applications, this research draws from both marketing and IS disciplines to integrate perceived value and individual differences into the research model. Moreover, gender is usually regarded as a moderator in technology adoption (Aguirre-Urreta and Marakas, 2010; Leppäniemi and Karjaluoto, 2008; Terzis and Economides, 2011). This research examines the moderating effects of gender on relationships between individual differences and behavioral intention.

The remainder of this paper is organized as follows. Section 2 introduces the theoretical background of this research. Section 3 proposes the research model and hypotheses. The research methodology is described in Section 4, followed by the data analysis in Section 5. Research results, implications, limitations, and future research are discussed in Section 6. The paper concludes in Section 7.

## 2. Theoretical background

### 2.1 M-coupon applications

The M-coupon service emerged with the development of mobile communication technologies and mobile internet. Due to its technological advantages, the M-coupon

service improved coupon redemption rates to ten times higher than paper-based coupons (Business Insider, 2013). This improvement encouraged many firms to enter into M-coupon marketing and offer their services to consumers. In the early stages, M-coupon service mostly delivered M-coupons in forms of SMS, Multimedia Messaging Service, and Wireless Application Protocol. With the widespread use of smartphones, offering client-end applications to consumers is gradually popular in M-coupon services. Users can download and install M-coupon applications on the smartphones to search, browse, and choose M-coupons. When a user wants to redeem an M-coupon at the merchants' premises, he or she only needs to use the corresponding M-coupon application to store the coupon in his or her smartphone, and show it to cashiers for a discount or cash back. Many M-coupon applications are also combined with a location-based service so that users can easily obtain coupons near their current location (Im and Ha, 2012).

Compared to paper-based coupon and online coupon services, the M-coupon applications overcome the constraints such as need to sort out, print, and carry coupons when consumers want to redeem them. They enable consumers to search coupons ubiquitously and redeem coupons through paperless means. However, consumers need to take a privacy risk because their personal information, such as their location and consumption preferences, may be tracked by service providers. Mobile network traffic fees are also paid to search and acquire coupons. Thus, consumers must be rewarded enough by M-coupon applications to balance their sacrifices so that they will accept them.

### 2.2 Perceived value

In marketing, customer perceived value, which is linked with competitiveness, is vital for an organization's success (Wang *et al.*, 2004). Given its importance, many scholars have offered their understanding of perceived value. Generally speaking, perceived value is defined as the consumer's subjective evaluation of the trade-off between benefits obtained from a product or service and sacrifices made for it (Dodds *et al.*, 1991; Naumann and Jackson, 1999; Zeithaml, 1988). In this view, the perceived value includes two components: benefits obtained and sacrifices expended. Earlier studies emphasized the benefit component on quality and sacrifice component on monetary price (Chang and Wildt, 1994; Kashyap and Bojanic, 2000), which showed a narrow view of perceived value. Other components, such as psychological benefits and non-monetary costs, should be considered (Zeithaml, 1988). Value perceptions are also discrepant across different contexts (Brady and Robertson, 1999). Thus, researchers recognized various benefit and sacrifice components of perceived value based on a specific situation. For example, Huber *et al.* (2001) proposed that, when purchasing a product, consumers consider the following sacrifices: costs of money, search, time, learning, and emotion, as well as cognitive and physical efforts which are accompanied by financial, social, and psychological risks. Petrick (2002) investigated perceived value of service in a fast-food restaurant and showed that the benefit components include quality, emotional response, and reputation, whereas the sacrifice components consist of monetary price and behavioral price. Chen and Dubinsky (2003) reported that the benefit components of perceived value in an e-commerce context include perceived product quality and valence of experience, whereas the sacrifice components of perceived value are perceived risk and product price. In addition, perceived value is conceptualized as a multi-dimensional construct. The value dimensions, such as quality, price, social, emotional, epistemic, conditional, and convenience value, have

been identified by researchers (Pura, 2005; Sweeney and Soutar, 2001). However, the common view is that perceived value is a ratio of total benefits to total costs, which is also employed in this research.

As a cognitive concept, perceived value helped in explaining consumers' consumption and decision-making behaviors. Marketing research showed that consumer's perceived value significantly predicts purchase intention in traditional offline shopping (Holbrook, 1994; Zeithaml, 1988) and online shopping (Chen and Dubinsky, 2003). In IS studies, perceived value has been used to explain user's adoption intention of wireless SMS (Turel *et al.*, 2007), mobile internet (Kim *et al.*, 2007b), and mobile service delivery (Kleijnen *et al.*, 2007). Although perceived value is an effective predictor of ICT adoption behavior, it has seldom been used to examine emerging ICT, such as M-coupon applications. The components of perceived value in the context of M-coupon applications are also rarely examined. Thus, identifying the benefits and sacrifices of M-coupon applications' perceived value and broadening the predicting range of perceived value to M-coupon applications are necessary.

### 2.3 Individual differences

Individual differences refer to personal-related factors that have been extensively divided into personality, cognitive style, and demographic/situational variables (Hirschberg, 1978). Personality reflects individuals' feelings and emotions that are adjusted to conform to the events, people, and situations in their lives. Traits, such as dogmatism, risk-taking propensity, and anxiety level are examples of personality variables. Cognitive style is how individuals handle information, and is usually composed of multi-dimensions, such as the simple and complex dimensions, and the field-dependent and field-independent dimensions. Demographic/situational variables include a series of personal characteristics, such as age, gender, education, experience, and professional direction. Among the three types of individual differences, personality is a stable characteristic that explains behavior (Hirschberg, 1978). Some studies supported that personality significantly influences the IT use (O'cass and Fenech, 2003; Xu *et al.*, 2011). Personal innovativeness in IT (PIIT), which is defined as a concept to depict the degree of an individual's propensity toward new IT adoption (Agarwal and Prasad, 1998), is the most widely examined personality factor in IT adoption research (Wu *et al.*, 2011). In coupon use research, studies recognized coupon proneness and price consciousness as main personality traits strongly associated with coupon use behavior (Dickinger and Kleijnen, 2008; Chen and Lu, 2011). Coupon proneness reflects consumers' affection and inherent longing for coupon use. Thus consumers who have a high degree of coupon proneness may positively search coupons through M-coupon applications. This research will examine the effects of PIIT and coupon proneness on consumers' acceptance of M-coupon applications. We exclude price-consciousness for the following consideration: price-consciousness reflects consumers' cognition of to what extent they can get money savings for the product or service from the use of coupons. Thus, price-consciousness may be more relevant to a specific coupon redemption decision rather than a coupon service adoption decision.

The demographic/situational variables such as age, gender, education, and experience also have been examined in both IT adoption and coupon use research. Among them, gender has received the most considerable attentions. In IS studies, most research regarded gender as a moderator (Terzis and Economides, 2011; Hwang, 2010; Wang and Wang, 2008) and investigated gender's moderating effect on consumers' perceptions and behavior. Some studies identified males are more

innovative and positive toward using new technologies than females (Venkatesh *et al.*, 2000). Nevertheless, the conclusion was rarely supported in a mobile context. In paper-based coupon usage research, it has been noted that females respond more positively to coupons compared to males (Harmon and Hill, 2003; Kwon and Kwon, 2007). Whether the effect of coupon proneness on behavioral intention toward M-coupon applications is also different between males and females is not clear. Thus, this study will examine the effects of gender on the relationships between personality traits and adoption intention toward M-coupon applications.

### 3. Research model and hypotheses

#### 3.1 *Perceived value and behavioral intention*

Based on the aforementioned definition, perceived value of M-coupon applications is an overall evaluation of utility that is measured by its benefits and sacrifices. When consumers perceive that the benefits received are greater than the costs expended, they may consider that M-coupon applications are valuable. As a result, the consumers will use those M-coupon applications. Extant research showed that perceived value positively influences users' adoption behavior of mobile service delivery (Kleijnen *et al.*, 2007). Therefore, we assume that:

*H1.* Perceived value positively affects consumers' behavioral intention toward M-coupon applications.

#### 3.2 *Benefit components and perceived value*

When evaluating benefits, previous studies distinguished utilitarian benefits from hedonic benefits (Lim and Ang, 2008). Utilitarian benefits refer to instrumental or cognitive benefits, such as efficiency and ease of use, whereas hedonic benefits usually focus on affective benefits, such as fun and enjoyment. Both types of benefit are important for new ICT adopters (Kim *et al.*, 2007a). In the context of M-coupon applications, as elaborated above by its specialized characteristics, the functional benefits may include perceived monetary savings and convenience, whereas the hedonic benefits can be reflected by perceived enjoyment. Thus, money savings, convenience, and enjoyment to consumers are the main benefits of using M-coupon applications.

*3.2.1 Perceived money savings.* Perceived money savings in this study are defined as a consumer's perception of economic savings from using M-coupon applications. Coupon face value, which reflects the extent of money savings, is a primary determinant factor of consumers' redemption behaviors (Nickels and Wood, 1997). A high face value coupon is more likely to be redeemed because consumers save more money from it. Similarly, although M-coupon applications aim at providing various coupons for consumers to reduce their consumption expenditures, the consumers may perceive low value of them and not redeem the coupons if the economic returns of these coupons are small. Thus, we hypothesize that:

*H2.* Perceived money savings positively affect perceived value of the M-coupon applications.

*3.2.2 Perceived convenience.* Convenience reflects consumers' resources, such as time and effort savings, in shopping or non-shopping activities (Farquhar and Rowley, 2009). Previous studies suggested that convenience is a multi-dimensional construct. Based on economic utility theory, Brown (1990) proposed that convenience has five

dimensions in service marketing: time, place, acquisition, use, and execution. Researchers redefined the concept of convenience to adapt to the mobile context. Yoon and Kim (2007) suggested that convenience of ubiquitous computing technology can be described by three dimensions: time, place, and execution. Thus, convenience is the degree of consumers' perceptions that they can use technology to finish their work at a convenient time, in a convenient place, and in a convenient way. Kim *et al.* (2010) argued that the convenience of mobile payment is a combination of time and place utilities. By combining the aforementioned definitions, perceived convenience in this study refers to consumers' perceptions of using coupons ubiquitously and conveniently by M-coupon applications.

M-coupon applications free consumers from the obstacles of collecting, carrying, and printing coupons, and enable consumers to search and obtain coupons easily, anytime and anywhere. These conveniences save significant time and effort for consumers and increase consumers' perceptions of value. Convenience has been regarded as a value dimension of perceived value of mobile commerce (Colwell *et al.*, 2008) and location-based mobile service (Pura, 2005). Thus, we hypothesize that:

*H3.* Perceived convenience positively affects perceived value of M-coupon applications.

*3.2.3 Perceived enjoyment.* Perceived enjoyment is "the extent to which the activity of using the computer system is perceived to be personally enjoyable in its own right" (Davis *et al.*, 1992). On the basis of this definition, perceived enjoyment in this research is defined as the degree of pleasure that consumers perceive from using M-coupon applications. Perceived enjoyment refers to intrinsic motivation of consumer's cognitive behavior. Sweeney and Soutar (2001) considered the perceived enjoyment of a product as the emotional value dimension that has an important role in predicting purchase behavior. In IS studies, Kim *et al.* (2007a) suggested that perceived enjoyment is an intrinsic benefit that positively influences the perceived value of mobile internet. Thus, we hypothesize that:

*H4.* Perceived enjoyment positively affects perceived value of M-coupon applications.

### *3.3 Sacrifice components and perceived value*

Perceived sacrifices include monetary cost and non-monetary costs (Zeithaml, 1988). Monetary cost is the money that consumers need to pay for a product or service. Non-monetary costs involved resources, such as time, effort, and energy that consumers need to spend to acquire and use a product or service. In the context of using M-coupon applications, monetary cost is measured by the perceived fees for the acquisition and use of M-coupons. The use of M-coupon applications has to be performed on smartphones. Thus, the non-monetary cost is the perceived privacy risk involved, which is especially the case when the location-based function is activated.

*3.3.1 Perceived fees.* Perceived fees in this study refer to the economic expenses incurred from using coupons through M-coupon applications. Consumers can run M-coupon applications to search coupons and browse concrete elements, such as photo displays, discount information, consumer reviews, and redemption locations of coupons, thereby incurring a mobile network fee. In particular, the perception of the fees is also produced from consumers' comparison between the fees of M-coupon application usage and costs of using previous forms of coupons, such as paper



coupons, online coupons, and SMS coupons. Perceived fees are monetary perceived costs, so high perception of fees would decrease perceived value. Extant studies have shown that perceived fees negatively affect perceived value of mobile internet (Kim *et al.*, 2007b). Thus, we posit that:

*H5.* Perceived fees negatively affect perceived value of M-coupon applications.

*3.3.2 Perceived privacy risk.* Privacy risk is defined as the potential loss for an individual to expose his or her personal information to corporations (Featherman and Pavlou, 2003). Privacy risk may result in unexpected problems, such as information disclosure and information abuse. M-coupon applications enable service providers to track an individual's consuming preference, or even daily schedule if they usually search for location-sensitive coupons. Thus, we define perceived privacy risk in this study as the consumers' perceptions of potential loss of privacy caused by disclosing consuming preference and locations to service providers. Perceived privacy risk refers to the psychological costs of perceived value. High perception of privacy risk may undermine perceived value. Kleijnen *et al.* (2007) identified that performance risk, financial risk, and security risk have negative effects on the perceived value of mobile service delivery. Thus, we assume that:

*H6.* Perceived privacy risk negatively affects perceived value of M-coupon applications.

### *3.4 Personal traits and perceived value*

*3.4.1 PIIT.* PIIT refers to the degree of individual's propensity toward new IT adoption (Agarwal and Prasad, 1998). Innovative individuals, who have a strong sense of curiosity, are more likely to try new things and lead the fashion trend. M-coupon applications as novel ideas satisfy the psychological needs of these individuals. Thus, these individuals more incline to adopt M-coupon applications. PIIT has been identified to have a positive effect on the adoption of mobile learning (Liu *et al.*, 2010) and mobile payment (Thakur and Srivastava, 2014). Thus, we assume that:

*H7.* PIIT positively affects the behavioral intention to adopt M-coupon applications.

*3.4.2 Coupon proneness.* Coupon proneness refers to a respondent's propensity for promotional offers (Dickinger and Kleijnen, 2008). Coupon-prone consumers enjoy collecting coupons. When they use coupons, good feelings are derived from the redemption process (Lichtenstein *et al.*, 1993). Srinivasan Swaminathan (2005) asserted that a consumer with higher coupon proneness has a higher propensity to redeem coupons. M-coupon applications serve as a better means for consumers to search, download, and redeem coupons. People with higher coupon proneness are more likely to use M-coupon applications than those with lower coupon proneness. Thus, we hypothesize that:

*H8.* Coupon proneness positively affects the behavioral intention to adopt M-coupon applications.

### *3.5 Moderating effects of gender*

Studies on IT adoption demonstrated that males and females perform differently in adoption intention and have a different attitude toward technologies. Males are more innovative and have a more positive attitude toward using technologies than females (Demirci and Ersoy, 2008; Venkatesh *et al.*, 2000). Lee *et al.* (2010) empirically argued

that males have a higher level of technology innovativeness and are more receptive in using self-service technologies than females. Other research also obtained similar findings in internet adoption (Teo *et al.*, 1999) and RFID technology adoption (Müller-Seitz *et al.*, 2009). Thus, we hypothesize that:

*H9.* The effect of PIIT on the behavioral intention to adopt M-coupon applications is stronger for males than for females.

Males and females have different behaviors in purchasing activities. Compared to males, females use more coupons (Harmon and Hill, 2003; Kwon and Kwon, 2007) and are more likely to make shopping decisions based on promotions (Blattberg *et al.*, 1978). These findings indicated that females are more prone to coupons than males. Thus, females may have higher coupon proneness than males. In addition, females have more needs in acquiring coupons. M-coupon applications can satisfy their needs of coupon acquisition. Therefore, the expectation that coupon proneness has a stronger effect on the behavioral intention to adopt M-coupon applications for females than for males is reasonable. We hypothesize that:

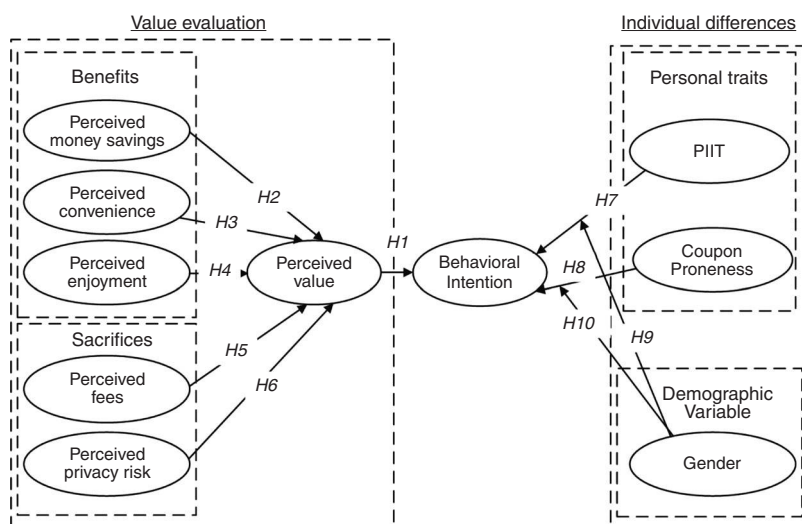
*H10.* The effect of coupon proneness on the behavioral intention to adopt M-coupon applications is stronger for females than for males.

The research model is depicted in Figure 1.

## 4. Methodology

### 4.1 Instrument

We used the data collected from a survey to test the research model. The nine constructs were measured with multiple items mainly adapted from instruments validated in previous studies. These constructs were modified to fit within the context of this study. Items of perceived money savings were developed from Mimouni-Chaabane and Volle (2010). Items of perceived convenience were adapted from Kim *et al.* (2010) and Yoon and Kim (2007). Perceived enjoyment, perceived value, perceived fees, and perceived privacy risk were developed from Mimouni-Chaabane and Volle (2010). Perceived enjoyment, perceived value, perceived money savings, and perceived convenience were adapted from Kim *et al.* (2010) and Yoon and Kim (2007). Perceived enjoyment, perceived value, perceived money savings, and perceived convenience were adapted from Kim *et al.* (2010) and Yoon and Kim (2007). Perceived enjoyment, perceived value, perceived money savings, and perceived convenience were adapted from Kim *et al.* (2010) and Yoon and Kim (2007).



**Figure 1.**  
Research model

and behavioral intention were measured by scales derived from Kim *et al.* (2007a). Items for perceived privacy risk and personal innovativeness were adapted from Agarwal and Prasad (1998). Perceived fees were measured by items selected from Luarn and Lin (2005). Items of coupon proneness were adapted from Dickinger and Kleijnen (2008).

A co-author first translated all the items into Chinese. Another co-author then translated the Chinese version back to English. The two co-authors compared the two English versions and confirmed the Chinese version to ensure translation validity. The Chinese version was further examined by two IS professors for additional comments. Based on their suggestions, some wordings of the questions in the survey were further amended. Finally, a pilot test with 35 M-coupon application users was conducted using the finalized Chinese version to confirm the flow and wording used in the questionnaire. The final scales and items are presented in Appendix 1. All items were measured using seven-point Likert scales that ranged from “strongly disagree” (1) to “strongly agree” (7).

#### 4.2 Data collection

Data were collected through an online survey approach. The reasons for choosing online survey instead of pencil-paper survey are as follows. First, this study investigates the special population with M-coupon application experiences. Online approach is more effective than pencil-paper approach to capture the validated respondents to meet the requirements of this study. Second, online approach is an autonomous way for respondents to finish the survey at their convenience, thus increase active participation. Third, as quoted by many studies, online approach can execute the survey with lower cost and faster speed. Lastly, previous studies have also showed that online survey has similar response quality to offline survey (Dickinger and Kleijnen, 2008). We placed the questionnaire link on the M-coupon forum homepages and invited people who had M-coupon application usage experience to participate in the survey. Rewards were offered as an incentive. Participants were told that they had a 10 percent chance of winning the rewards, and required to provide their e-mail addresses for a lottery drawing. The e-mail address was also used to contact them if they won the lottery. Winners would obtain 30 yuan RMB through an online payment service. To avoid repeat responses, the same Internet Protocol address was allowed to submit data only once. The data collection stage lasted three weeks (from July 1, 2013 to July 21, 2013). We found that most subjects who used M-coupon applications had only experienced them less than five times. Limited experience is suitable for acceptance study.

After dropping those with incomplete answers or almost the same answer for all questions, we had 271 valid responses. Among the participants, 52 percent were male and 48 percent were female; 87 percent were between 18 and 30 years old; more than 65 percent were with a bachelor or above degree; over 85 percent had less than five times of usage experience. A detailed demonstration of demographic characteristics is shown in Table I.

#### 4.3 Common method bias testing

The sample data were gathered based on consumers' self-reports. Thus, we executed Harman's one-factor test (Harman, 1976) to confirm the existence of common method bias. By conducting factor analysis in SPSS 16.0, we determined that nine factors were

Measure	Item	Count	%	Perceived value and individual differences
Gender	Male	141	52	
	Female	130	48	
Age	≤18	4	1.5	
	> 18 and ≤24	165	60.8	
	> 24 and ≤30	71	26.2	
	> 30 and ≤35	23	8.5	
	> 35	8	3.0	
Education	High school or below	14	5.2	
	Associate degree	70	25.8	
	Bachelor's degree	175	64.6	
	Master's degree or above	12	4.4	
Occupation	Student	121	44.7	
	Corporation	102	37.6	
	Education	9	3.3	
	Government	13	4.8	
	Self-employed	16	5.9	
	Unemployed	10	3.7	
Monthly income (yuan)	< 1,000	95	35.1	
	≥1,000 and < 3,000	93	34.3	
	≥3,000	83	30.6	
Usage	> 0 and ≤4	233	86	<b>Table I.</b> Demographic characteristics of the research sample
Experience (times)	> 5	38	14	

**Note:**  $n = 271$

extracted. The largest explained variance of factors was 30.15 percent, which was in an acceptable range. Thus, the common method bias in this research was not significant.

## 5. Data analysis and results

We tested the research model using structural equation modeling (SEM). There are two SEM approaches: covariance-based SEM (CB-SEM) and variance-based SEM (PLS-SEM). Compared to CB-SEM, PLS-SEM has advantages such as lower level restrictions on sample size and distribution, stronger ability to analyze complex structural models, and simultaneous estimation of both measurement and structure models (Chin, 1998). As a component-based approach, PLS-SEM excels in optimizing the prediction accuracy, thus it is more suitable for theory development and prediction-oriented studies. As this study is one of initial explorations of M-coupon applications adoption and the sample size is not so large enough, we chose PLS-SEM approach to estimate the research model. Employing SmartPLS, we examined the model in two steps. First, we analyzed the measurement model to ensure the reliability and validity of the constructs. Next, we tested the structural model to examine the hypotheses.

### 5.1 Measurement model

Confirmatory factor analysis (CFA) was performed to check the validity and reliability. Cronbach's  $\alpha$ , average variance extracted (AVE), and composite reliability (CR) were calculated to examine the internal consistency reliability and convergent validity. As shown in Table II, all the Cronbach's  $\alpha$  values were higher than 0.7, which indicates

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Construct	Item	Loading	Cronbach's		
			$\alpha$	CR	AVE
Perceived money savings (PMS)	PMS1	0.872	0.822	0.894	0.737
	PMS2	0.879			
	PMS3	0.823			
Perceived convenience (PC)	PC1	0.878	0.862	0.906	0.707
	PC2	0.884			
	PC3	0.800			
	PC4	0.797			
Perceived enjoyment (PE)	PE1	0.903	0.876	0.923	0.800
	PE2	0.894			
	PE3	0.888			
Perceived fees (PF)	PF1	0.943	0.851	0.931	0.869
	PF2	0.921			
Perceived privacy risk (PPR)	PPR1	0.929	0.916	0.946	0.854
	PPR2	0.919			
	PPR3	0.925			
Perceived value (PV)	PV1	0.869	0.904	0.933	0.776
	PV2	0.880			
	PV3	0.891			
	PV4	0.883			
Personal innovativeness in information technology (PIIT)	PIIT1	0.927	0.889	0.930	0.816
	PIIT2	0.854			
	PIIT3	0.927			
Coupon proneness (CP)	CP1	0.859	0.780	0.868	0.622
	CP2	0.776			
	CP3	0.711			
	CP4	0.802			
Behavioral intention (BI)	BI1	0.895	0.871	0.921	0.795
	BI2	0.903			
	BI3	0.876			

**Table II.**  
Results of  
standardized item  
loading,  $\alpha$ , CR,  
and AVE

high reliability of the scales (Liu, 2015). All item loadings are above 0.7. The AVE of each construct exceeded 0.5 and the CRs were all above 0.8. Hence, the convergent validity of scale is good (Liu and Wang, 2014).

Furthermore, the square root of the AVE of each construct and its corresponding correlation coefficients with other constructs were compared. As shown in Table III,

	PMS	PC	PE	PF	PPR	PV	PIIT	CP	BI
PMS	<i>0.859</i>								
PC	0.416	<i>0.841</i>							
PE	0.415	0.422	<i>0.895</i>						
PF	-0.257	-0.171	-0.110	<i>0.932</i>					
PPR	-0.186	-0.170	-0.035	0.291	<i>0.924</i>				
PV	0.495	0.509	0.478	-0.305	-0.236	<i>0.881</i>			
PIIT	0.205	0.295	0.304	-0.186	-0.063	0.283	<i>0.903</i>		
CP	0.272	0.300	0.317	-0.115	-0.133	0.354	0.318	<i>0.789</i>	
BI	0.314	0.457	0.460	0.314	-0.109	0.548	0.407	0.547	<i>0.891</i>

**Table III.**  
Correlation  
coefficient matrix  
and square roots of  
the AVEs

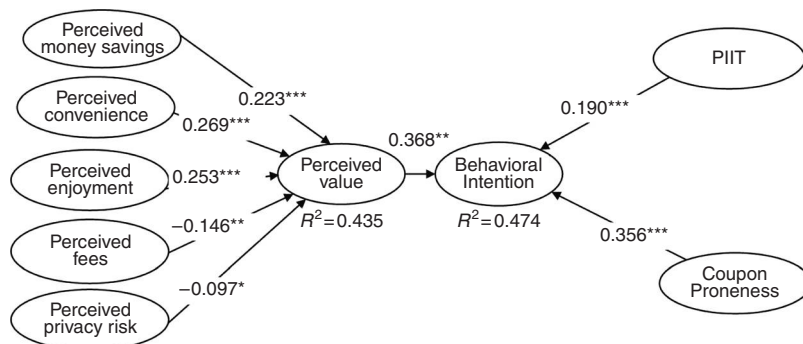
**Note:** The square roots of AVEs are reported on the diagonal

the corresponding correlation coefficient of each construct was lower than the square root of the AVE, which indicates that the discriminant validity of the scales is acceptable.

5.2 Hypothesis testing

5.2.1 Results of structure model for overall data. The results of the hypothesis test were presented in Figure 2 and Table IV. The results illustrate that all the core hypotheses are supported. Perceived convenience, perceived enjoyment, and perceived money savings, have positive effects on perceived value. Perceived privacy risk and perceived fees both have negative effects on perceived value. Perceived value, PIIT, and coupon proneness have positive effects on behavioral intention. Most of the relationships proposed are significant at the 0.001 level, except the relationship between perceived privacy risk and perceived value, which is significant at the 0.05 level, and the relationship between perceived fees and perceived value, which is significant at the 0.01 level. The  $R^2$  values for perceived value and behavioral intention are 0.435 and 0.474, respectively.

The predictive relevance ( $Q^2$ ), the effect size ( $f^2$ ), and the relative impact of predictive relevance ( $q^2$ ) were also assessed and the results were showed in Table IV. According to Henseler *et al.* (2009),  $Q^2$  above 0 indicates that the model has predictive relevance;  $f^2$  values of 0.02, 0.15, and 0.35, respectively, imply weak, medium, and large effects of predictor latent variables;  $q^2$  values of 0.02, 0.15, and 0.35, respectively, imply weak, medium, and large effects of relative impacts of predictive relevance. As shown in



Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Figure 2. Testing results of the research model

Path	$\beta$	t-value	$f^2$	$q^2$
PMS→PV	0.223	3.584	0.06	0.23
PC→PV	0.269	4.897	0.09	0.26
PE→PV	0.253	4.293	0.08	0.24
PF→PV	-0.146	2.741	0.03	0.20
PPR→PV	-0.097	2.126	0.02	0.19
PV→BI	0.368	6.915	0.21	0.14
PIIT→BI	0.190	3.749	0.06	0.03
CP→BI	0.356	6.805	0.20	0.12

Notes: The  $Q^2$  of perceived value is 0.334. The  $Q^2$  of behavioral intention is 0.368

Table IV. Indicators of the structural model

Table IV,  $Q^2$  values in this study are  $> 0$ , which indicate the predictive relevance of the model. The  $f^2$  values and  $q^2$  values range from 0.02 to 0.26, which demonstrate weak to medium effects. These results further provide evidence to support the causal relationships proposed in this study.

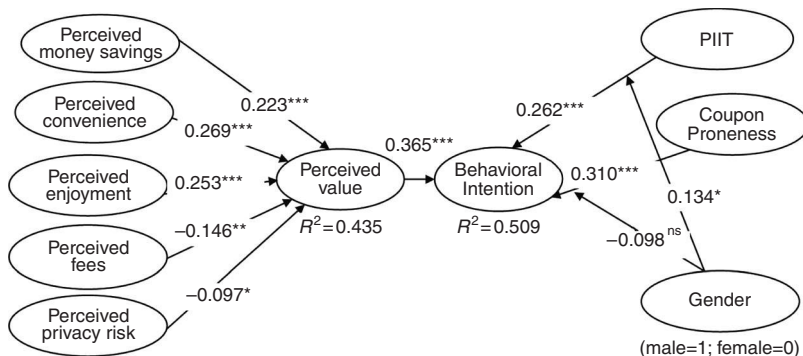
5.2.2 *Results of moderating effects.* Gender is a dichotomous categorical variable. To examine the moderating effects, we coded gender as a dummy variable with male = 1 and female = 0 and tested the moderating effects of gender according to the methodology proposed by Chin *et al.* (2003). The testing results are shown in Figure 3. The moderating effect of gender on the relationship between PIIT and behavioral intention is significant, but the relationship between coupon proneness and behavioral intention is insignificant. The  $R^2$  for behavioral intention increases from 0.474 to 0.509. The significant coefficient indicates that gender has a positive moderating effect on the relationships between PIIT and behavioral intention, which means that PIIT has a stronger effect on behavioral intention for males than for females.

## 6. Discussion

### 6.1 Discussion of results

From the perspectives of perceived value and individual differences, this research explores the factors that influence consumers' perceived value and behavioral intention of M-coupon applications in China. We also examine the moderating effects of gender on the relationship between personal traits (PIIT and coupon proneness) and behavioral intention. Based on the analysis of empirical data, we can obtain the following findings.

First, perceived value has a significant impact on behavioral intention. This finding supports the argument of previous studies demonstrating that perceived value can predict consumers' adoption intention of new ICT (Kim *et al.*, 2007b; Kleijnen *et al.*, 2007). Perceived value is the most significant determinant of behavioral intention. This finding indicates that perceived value has a key role in consumers' adoption decision. Thus, improving consumers' perceived value of M-coupon applications can contribute in enhancing their adoption behavior. Specific dimensions, such as "always on," location-centric, convenience, customization, and identifiability, are value propositions of mobile commerce (Wen and Mahatanankoon, 2004). Therefore, to advance the service value, M-coupon application providers can expand the coverage scope of coupons so that consumers can always receive coupon service. Furthermore, providing



**Figure 3.** Testing results of the moderating effects

Notes: ns, non-significant. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

tailored coupons based on consumers' location and profiles or specific coupons with unique specials can also effectively increase consumers' value perceptions.

Second, consistent with previous studies (Citrin *et al.*, 2000; Liu *et al.*, 2010), the positive effect of PIIT on the behavioral intention of new technology has been supported in this study. Meanwhile, coupon proneness is also demonstrated to have a positive effect on behavioral intention. These findings imply that people with a higher level of PIIT or coupon proneness are more inclined to accept M-coupon applications. Thus, application providers can consider these people as key targets to develop and promote their business. Innovators tend to be young and well educated. College students and recent graduates belong to this group. Moreover, their financial capabilities are relatively limited because they have been unemployed or employed only for a short time, and they may be more interested in coupon usage to relieve their economic pressures. Thus, application providers can supply coupons that match with college students and recent graduates' consuming habits to attract more potential consumers.

Third, the results indicate the positive effects of perceived benefits on perceived value. The perceived benefits, in order of their relative importance, are as follows: perceived convenience, perceived enjoyment, and perceived money savings. This finding shows that consumers not only use M-coupon applications for utilitarian benefits but also for hedonic benefits. Thus, saving money is not the only purpose for consumers to adopt M-coupon applications. In addition to offering substantial coupons, service providers should take actions to increase consumers' perceptions of convenience and entertainment to attract more consumers. Among the three benefits, perceived money savings have the smallest relative effect on perceived value. Two possibilities are attributed to this result. First, in considering the expense incurred in using M-coupon applications, perceived fees may offset part of money saving perceptions. Second, M-coupon applications enable consumers to use coupons ubiquitously, which save more time and energy for consumers. Simultaneously, consumers can share coupons on their social networks and attend offline activities organized by application providers, which brings them much enjoyment. Thus, the convenience and enjoyment benefits may distract consumers' attention from the money saving benefit.

With regard to perceived sacrifices, both perceived fees and perceived privacy risk have a negative effect on perceived value. Compared to perceived privacy risk, perceived fees have a relatively larger effect on perceived value. This finding indicates that consumers care significantly about usage cost. The negative effect of perceived fees on perceived value has been validated by other studies (Kim *et al.*, 2007b; Lin *et al.*, 2012). Thus, application providers should focus on decreasing usage cost or offer an extra reward plan to reduce consumers' perceived fees. The negative effect of perceived privacy risk on perceived value shows that application providers have to strengthen consumers' privacy protection to heighten their perceived value.

Fourth, the moderate effects of gender on the relationship between personal traits and behavioral intention have been examined. The results show that PIIT has a stronger effect on behavioral intention for males than for females. This finding supports that of previous studies, such as Müller-Seitz *et al.* (2009) and Lee *et al.* (2010). Contrary to our expectations, the positive effect of coupon proneness on behavioral intention for females is not significantly larger than that of males. Earlier studies pointed out that males are less willing to use paper coupons because they need to spend much effort and time on coupon collection and preservation (Harmon and Hill, 2003;



Hill and Harmon, 2009). However, M-coupon applications enable consumers to obtain coupons quickly and easily, and consumers need not collect coupons in advance and carry them when they want to redeem coupons. Thus, even though males responded less positively toward coupons than that of females in the past, their coupon proneness has almost the same impact as that of females on behavioral intention toward M-coupon applications. This result implies that M-coupon applications may change males' past coupon-using behavior.

## 6.2 Research implications

**6.2.1 Theoretical implications.** This study provides implications both for scholars and practitioners. For scholars, this research may be among the first to examine consumers' behavioral intention toward M-coupon applications. Prior studies mainly focussed on the usage behavior of M-coupons and overlooked the important role of M-coupon applications in coupon usage. This research fills this gap. Most studies investigated M-coupon users' behavior from the perspective of technology users. This study integrated perceived value and individual differences into the model to examine M-coupon application users' behavior from the perspective of the consumers. We found that consumers' perceived value and personal traits, including PIIT and coupon proneness, all positively influence their adoption intention. Moreover, considering that perceived value has been identified to be a valid predictor of adoption behavior in new ICT (Kim *et al.*, 2007b), we explored the antecedents of perceived value in the context of M-coupon applications. We found that perceived money savings, perceived convenience, and perceived enjoyment positively influence perceived value, whereas perceived privacy risk and perceived fees negatively influence perceived value. These factors were not tested in previous M-coupon studies. This research expands the M-coupon literature. Finally, this research examined the moderate effects of gender on personal traits and behavior. The results show that males' innovativeness has a more positive effect on behavioral intention than females, but females' coupon proneness does not have a significantly larger effect on behavioral intention than that of males. This finding indicates that the new form of M-coupon service may modify males' consuming behavior, which enriches couponing research.

**6.2.2 Practical implications.** Some important practical implications exist. First, the most urgent task for M-coupon application providers is to improve the consumer's perceived value. Even though changing consumers' personal traits is difficult for providers, they can augment consumers' perceived value. To highlight the value of M-coupon applications, providers can take measures in two ways. On one hand, providers should increase consumer's perceived money savings, perceived convenience, and perceived enjoyment of M-coupon applications. For example, application providers can emphasize the convenience of M-coupon applications to search and redeem coupons, create and develop functionalities to induce consumers' perceived enjoyment effectively, and provide more favorable coupons and more valuable offers, such as personalized or customized service for consumers. On the other hand, providers should decrease consumer's perceptions of fees and privacy risk. For instance, the providers can improve the accuracy of coupon search to reduce the coupon searching fees. Besides the special offer provided by coupons, offering extra rewards (e.g. fictitious money or bonus points) to consumers may also degrade perceived fees. To reduce the perceived privacy risk, providers can enhance consumers'

privacy controls, and offer privacy protection commitment to help consumers mitigate privacy risk.

Second, the strong effect of coupon proneness on behavioral intention indicates that people who prefer to use coupons tend to respond to M-coupon applications more positively. Application providers can target them as potential adopters. Innovativeness can also positively influence behavioral intention. Thus, providers should try to apply newer innovative consumer services and target college students and recent graduates who are more innovative as early adopters. In addition, providers can take measures, such as word of mouth recommendation, to speed up the diffusion of their service based on current users.

Third, the results demonstrate that males are more positively inclined toward M-coupon applications because of their innovativeness. M-coupon applications may change males' reluctance of coupon usage. The current M-coupon applications provide a large number of coupons for females, such as beauty salon and hair salon coupons, but few coupons are supplied specifically for males. Thus, coupons for males' consumption should be provided by M-coupon applications.

### 6.3 Limitations

This study had some limitations. First, we collected data through an online survey. This method excluded the consumers who do not use the internet, especially people who are older or computer illiterate. However, early adopters of IT are generally young, well-educated people. The vast majority of our sample was below 35 years old and had an associate degree or higher, which was in the block of early IT adopters. Second, to achieve parsimony of the model, we only considered several major benefits and sacrifices to evaluate the perceived value. The explained variance of perceived value in this study was 43.5 percent. Thus, other antecedents should be considered. For example, quality factors, such as system quality, information quality, and service quality, should be considered into the benefit component of perceived value. Meanwhile, other sacrifices, such as cognitive effort and change in coupon-using habits, should also be included into the sacrifice component of perceived value. Third, perceived value emphasizes consumers' comprehensive assessment of the costs and benefits, whereas IT adoption models focus on the influence of technology attributes on behavioral intention. Both perceived value and technology factors are important predictors of behavioral intention in mobile services. Besides perceived value and individual difference factors, other factors (e.g. perceived usefulness, perceived ease of use, and social norm), which have been generalized to have significant effects on the behavioral intention of ITs, should be included in the model. Fourth, this research only examined the moderating effects of gender. Other demographic/situational variables such as age, education, and experience may also be considered. Finally, we conducted research in China. As the progress of M-coupon applications varies among countries, the conclusions may be not the same when the research model is applied to other countries.

### 6.4 Future research

This study offers opportunities for future research. First, the research focussed on consumers' behavior toward M-coupon applications, but the attitude of merchants remains unknown. Future research can examine the factors that influence merchants' willingness to add their coupons into the M-coupon applications. Second, we focussed

on the function of M-coupon applications and did not consider their system quality. Future research can examine factors related to system quality, such as reliability and accessing speed. Third, using context is an important factor of mobile service adoption (Mallat *et al.*, 2009). When people make provisional decisions of consumption out of doors or travel to a strange place, they may be more inclined to use M-coupon applications. Future research should investigate the influence of using context on the behavioral intention of M-coupon applications. Fourth, as UTAUT2 is an integrated model to investigate consumers' adoption of technologies, future research should be conducted to examine the validity of UTAUT2 in the context of M-coupon applications. Finally, M-coupon applications overcome difficulties in previous coupon usage, namely, wasting time and effort to collect coupons, trouble in printing coupons, and forgetting to carry coupons. Thus, searching for coupons before consuming them is convenient with M-coupon applications. Whether M-coupon applications can change the consuming habit of non-coupon proneness in individuals should be explored in future research.

## 7. Conclusion

This study focussed on consumers' intention to accept M-coupon applications in China. Based on prior research, this study provides empirical evidence on how perceived value and individual differences influence the intention to adopt M-coupon applications, as well as how consumers perceive the value of M-coupon applications. The results show that perceived value is the most determinant factor of behavioral intention. Perceived value is positively influenced by perceived money savings, perceived convenience, and perceived enjoyment, but negatively influenced by perceived privacy risk and perceived fees. Furthermore, the results suggest that individuals with higher PIIT or coupon proneness will accept M-coupon applications more positively. Finally, the moderating effects of gender were tested, which showed that PIIT has a more positive effect on the intention to adopt M-coupon applications for males than for females. Practitioners can offer more valuable services to a special population with higher PIIT or coupon proneness, and focus more attention to males' consumption for expanding their user base.

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## Appendix 1. Scales and items

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Perceived  
value and  
individual  
differences

493

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*Perceived money savings (PMS) (Mimouni-Chaabane and Volle, 2010)*

- PMS1. M-coupon applications can save you a lot of money
- PMS2. Using M-coupon applications, I spend less
- PMS3. M-coupon applications enable me to shop at a lower financial cost

*Perceived convenience (PC) (Kim et al., 2010; Yoon and Kim, 2007)*

- PC1. Using M-coupon applications enable me to use coupons at any time
- PC2. Using M-coupon applications enable me to use coupons in any place
- PC3. Using M-coupon applications give me convenience to find needed coupons
- PC4. I find M-coupon applications are convenient for coupon usage

*Perceived enjoyment (PE) (Kim et al., 2007b)*

- PE1. I have fun interacting with M-coupon applications
- PE2. Using M-coupon applications provides me a lot of enjoyment
- PE3. I enjoy using M-coupon applications

*Perceived privacy risk (PPR) (Xu et al., 2011)*

- PPR1. Providing the application providers with my personal information (e.g. location and consuming preferences) would cause many unexpected problems
- PPR2. It would be risky to disclose my personal information to the application providers
- PPR3. There would be high potential for loss in disclosing my personal information to application providers

*Perceived fees (PF) (Luarn and Lin, 2005)*

- PF1. It would cost a lot to use M-coupon applications
- PF2. There are financial barriers (e.g. paying for mobile network fee) to my using M-coupon applications

*Perceived value (PV) (Kim et al., 2007b)*

- PV1. Compared to the fee I need to pay, the use of M-coupon applications offer value for money
- PV2. Compared to the effort I need to put in, the use of M-coupon applications is beneficial to me
- PV3. Compared to the time I need to spend, the use of M-coupon applications is worthwhile to me
- PV4. Overall, the use of M-coupon applications delivers me good value

*Personal innovativeness in Information Technology (PIIT) (Agarwal and Prasad, 1998)*

- PIIT1. If I heard about a new information technology, I would look for ways to experiment with it
- PIIT2. Among my peers, I am usually the first to try out new information technologies
- PIIT3. I like to experiment with new information technologies

*Coupon proneness (CP) (Dickinger and Kleijnen, 2008)*

- CP1. Redeeming coupons makes me feel good
- CP2. I enjoy using coupons, regardless of the amount I save by doing so
- CP3. I have favorite brands, but most of time I buy brands I have a coupon for
- CP4. Beyond the money I save, redeeming coupons gives me a sense of joy

*Behavioral intention (BI) (Kim et al., 2007b)*

- BI1. I plan to use M-coupon applications in the future
- BI2. I intend to use M-coupon applications in the future
- BI3. I predict I would use M-coupon applications in the future

**Table AI.**  
Measurement items  
and sources





Figure A1.  
DDcoupon  
application's  
interface 1



Perceived  
value and  
individual  
differences

495

**Figure A2.**  
DDcoupon  
application's  
interface 2

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