Perceptions toward Mobile Banking: Any Differences among Its Potential Adopters?

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Abstract

To understand potential adopters' perceptions of mobile banking services, a theoretical framework was proposed based on a review of extant literature on technology adoption. To validate the hypotheses, an empirical survey was conducted via an Internet survey with the help of a market research company in Korea. The result of our structural equation model analysis showed that enjoyment, usefulness, ease of use, and subjective norms evenly contributed to forming attitude toward mobile banking. However, the results varied for consumers who primarily used different types of banking services. Specifically, consumers who mainly used Internet banking seemed to be influenced by perceived enjoyment as well as ease of use when judging mobile banking. In comparison, for consumers who primarily used conventional channels such as ATMs and branches, attitude toward mobile banking was more strongly influenced by subjective norms, perceived usefulness, and ease of use. These results provide meaningful implications for practitioners who are planning to attract more existing customers to the new service channel.

Keywords: mobile banking, service channels, technology adoption, group comparison

1. Introduction

In the past decade, the delivery channel for retail banking service has gone through several innovative phases, including Automated Teller Machines (ATMs), telephone banking, Internet banking, and mobile banking. Mobile banking enables subscribers to use portable communication devices to access their banking accounts and use financial services such as transaction history checks, money transfer or wiring, and bill payments, regardless of location or time. Mobile banking has received considerable attention from practitioners as a new business tool for attracting new customers, improving customer retention rate, and enhancing operational efficiency, but actual consumer adoption of mobile banking has been much lower than expected (Shaikh and Karjaluoto 2015).

Individuals make decisions based on what they perceive to be reality, but the reality is a totally personal phenomenon based on that person's experiences as well as their values and needs (Schiffman and Kanuk 2007, p.150). Consumers may perceive mobile banking as valuable since they can use banking services regardless of time and location. Some may believe that it is easy to use or fun to use since the service is delivered through a mobile phone instead of a computer. Others may think that mobile banking is just an extension of Internet banking to the mobile environment. Thus, consumer perceptions of mobile banking services may be different depending on their banking service usage behaviors. Specifically, if some use Internet banking as their primary banking service channel while others use conventional services (e.g., branches, ATMs), these different groups of consumers may have different perceptions of mobile banking.

Previous studies on consumer acceptance of a new technology have not been enough to fully understand consumer attitudes toward using mobile banking, not only due to the target technology being studied but also due to limited research designs. Some research models have been validated using student samples rather than more representative consumer samples (e.g., Davis, Bagozzi, and Warshaw 1989; Jackson, Chow, and Leitch 1997; Taylor and Todd 1995) and others have focused only on instrumental constructs, such as usefulness and ease of use (e.g. Hu et al. 1999; Keil, Beranek, and Konsynski 1995). In addition, there have been calls for further research that investigates a more comprehensive model by considering other constructs, such as subjective norms, that may influence new technology acceptance behaviors (Al-Gahtani and King 1999; Lee, Kozar, and Larson, 2003).

As an attempt to fill these research gaps, the present study examined factors that contribute to understanding consumer intention to use mobile banking services, including social and hedonic factors as well as the utilitarian aspect. To achieve this goal,we proposed a theoretical model based on previous studies. To validate the proposed research model, we conducted an Internet survey in Korea and used a structural equation analysis to analyze the data. To better understand psychometric properties of consumer attitudes toward mobile banking, we employed a subgroup analysis by dividing the samples into two groups based on the banking service channel that they mainly used. We conclude this study with theoretical and practical implications of the findings.

If mobile banking is a future dominant service channel, we are at a good point to investigate some of the issues related to its adoption. The results of this study will contribute to maximizing the adoption of mobile banking by giving practitioners a better understanding of underlying structure of consumer attitudes toward mobile banking, thus helping them to develop more appropriate marketing strategies.

2. Theory and Research Model

Davis's (1986) Technology Acceptance Model (TAM) is a tailored version of the Theory of Reasoned Action (TRA)(Ajzen and Fishbein 1980), which explains user acceptance behaviors across various information technologies. The model predicts that perceived usefulness and perceived ease of use are salient beliefs determining consumers' attitudes. Perceived usefulness indicates the extent to which a technology enhances a user's performance, while perceived ease of use is defined as the degree to which a person believes that using the target technology would be free of effort (Davis et al. 1989). Perceived usefulness is also affected by perceived ease of use. The causal relationships among the two beliefs and attitude have been validated in many studies across various academic fields including marketing (e.g., Agarwal and Prasad 1999; Meuter et al. 2005; Webster and Trevino 1995).

While TAM was a useful starting point for understanding the acceptance of new technology, the broad range of research on TAM (for a review of this literature, see Lee et al. 2003; Legris, Ingham, and Collerette 2003) suggests that the model is not sufficient to account for acceptance of new technologies in various situations. For example, TAM does not consider the role of subjective norms, which is defined as an individual's perceptions of the opinions of others that are important to that person (Cooper and Zmud 1990; Lu, Yao, and Yu 2005). The concept of subjective norms is based on the notion that individuals behave in a way that allows them to maximize favorable outcomes by meeting the expectation of others. Most previous studies that have investigated subjective norms posited that subjective norms directly influence behavioral intention,as proposed in TRA (e.g. Nysveen, Pedersen, and Thorbjørnsen 2005; Oliver and Bearden 1985; Venkatesh and Morris 2000). Meanwhile, several researchers have claimed that it is difficult to differentiate indirect effect of subjective norms via attitude from itsdirect effect on behavioral intention (Davis et al. 1989; O'Keefe 1990; Smetana and Adler 1980). Subjective norms may also indirectly influence behavioral intention via attitude because an individual's attitude might be reframed by subjective norms when the person internalizes the norms (Warshaw 1980). Ajzen and Fishbein (1975) also acknowledged that subjective norms are one of the least understood aspects of TRA. Thus, this study posited that subjective norms indirectly affect behavioral intention via attitude as well as directly affecting it.

As shown by other recent research, another important belief that explains intrinsic motivation to adopt a technology is enjoyment (Al-Gahtani and King 1999; Park 2006; Teo, Lim, and Lai 1999; Venkatesh and Davis 2000). Enjoyment refers to a relatively enduring tendency and an intrinsic belief that is created from an individual's subjective experience with the technology (Moon and Kim 2001). Among previous studies of information systems acceptance, the majority have focused only on utilitarian aspects. Meanwhile, recent studies of service delivery through mobile devices have found that the hedonic aspect is an important factor for attitude formation (e.g. Dickinger, Arami, and Meyer 2006; Wakefield and Whitten 2006). In addition, Wakefield and Whitten (2006) showed that consumers perceived services as more useful when the interactions with a mobile device were playful. Therefore, this study posited that enjoyment directly influences attitude as well as indirectly influencing attitude via perceived usefulness.

Based on the discussion above, the following hypotheses were proposed (for a graphic version, see Figure 1). In addition to testing these hypotheses, this study examined whether the proposed relationships vary across consumers who use different types of primary banking channels.

H1: Perceived usefulness influences attitude toward using mobile banking.

H2:Perceived ease of use directly influences attitude toward using mobile banking (H2a) and indirectly influences attitude via perceived usefulness (H2b).

H3: Perceived enjoyment directly influences attitude toward using mobile banking (H3a) and indirectly influences attitude via perceived usefulness (H3b).

H4: Subjective norms directly influence behavioral intention to use mobile banking (H4a) and indirectly influence behavioral intention via attitude (H4b).

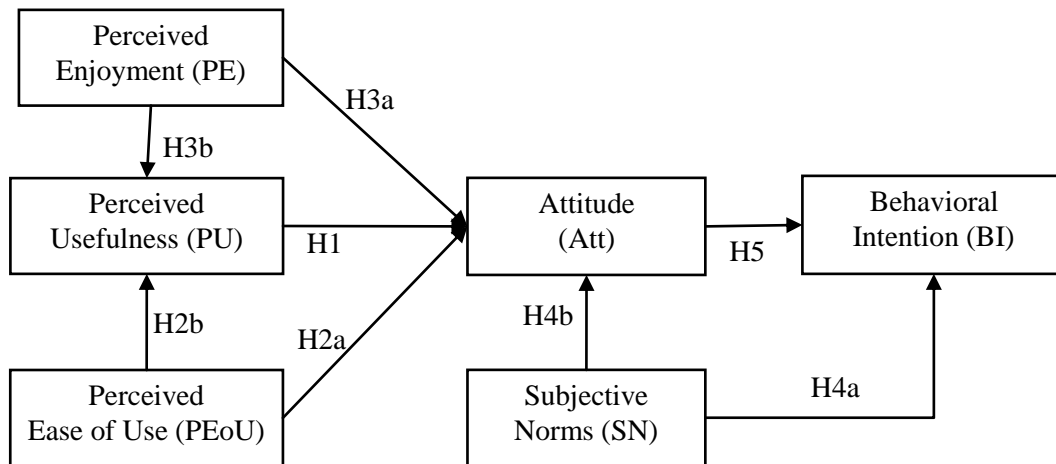H5: Attitudes towards using mobile banking service influences behavioral intention to use it.

Figure 1. Proposed Research Model

3. Data Collection Procedure

Data were collected through an Internet survey with the help of a reputable market research company in Korea. To draw nationally representative samples, we employed a stratified random sampling method by age and region. A total of 346adults who hadat least one personal banking account but were not current mobile banking users were included for our analysis. The measurement items of this study were adapted from previous studies of technology acceptance behaviors. The items for perceived usefulness (PU) and perceived ease of use (PEoU) were developed based on Davis's study (1989). The items for perceived enjoyment (EN) and subjective norms (SN) were also adapted from previous studies (e.g. Davis, Bagozzi, and Warshaw 1992; Moon and Kim 2001; Venkatesh and Morris 2000). All items were set in a 7-point Likert-scale ranging from "strongly agree" to "strongly disagree." Measurement items are shown in Appendix 1.

The current primary banking service channel was measured using a self-reported item: "What is the primary banking service channel that you use most frequently?" The possible answers were "Internet banking," "bank branches," "ATMs," and "telephone banking." This item was used to divide the samples into two groups: Group A consisted of people who used Internet banking as their primary banking channel and Group B consisted of people who primarily used other channels (i.e., bank branches, ATMs, phone-banking). For example, if a person used bank branches more frequently than other service channels, regardless of previous experiences with Internet banking, the person was categorized into Group B.

4. Results

4.1 Sample characteristics

The demographic characteristics of the sample are shown in Table 1. Among 346 respondents, 54.05% were males while 45.95% were females. Considering that the survey was conducted via Internet survey, the age of the samples showed a well-balanced range of the adult population: 33.24%, 34.39%, and 21.68% of them were in their twenties, thirties, and forties, respectively, and the remaining participants were more than 50 years old. While 21.68% of the total samples had a high school diploma or below, 66.76% and 11.56% attended a university/college or graduate school, respectively.

Table 1. Sample Characteristics (N=346)

Demographics	Frequency (%)
Gender	
Male	187 (54.05%)
Female	159 (45.95%)
Age	
20~29	115 (33.24%)
30~39	119 (34.39%)
40~49	75 (21.68%)
50 +	37 (10.69%)
Education (highest degree)	
High school/ below High school	75 (21.68%)
University/College	231 (66.76%)
Graduate school and above	40 (11.56%)
Total	346 (100.00%)

4.2 Measurement Model

To examine the distribution and normality of the observed items, we calculated the mean, standard deviations, skewness, and kurtosis. If the absolute value of skewness is less than 3 and the absolute value of kurtosis is less than 8, the item satisfies the univariate normality assumption (Kline 1998). The results showed that no items seriously deviated from the normal distribution, proving the suitability of the empirical data for the next statistical analysis. Following the two-step approach (Anderson and Gerbing 1988), we conducted a confirmatory factor analysis (CFA) to assess the measurement model followed by a structural equation model analysis. The CFA measurement model allowed all the constructs – subjective norms, usefulness, ease of use, enjoyment, attitude, and behavioral intention – to be correlated to each other without any causal relationships. With the χ^2 fit test, comparative fit index (CFI), Tucker Lewis Index (TLI), and root mean square error of approximation (RMSEA) were computed as alternative fit indices. As a rule of thumb, a cutoff value close to 0.95 for CFI and TLI and a cutoff value close to 0.06 for RMSEA are recommended (Hu and Bentler 1999). Although the $\chi2$ value was significant, other fit indices indicated that the measurement model fit the data well: $\chi^2_{(89)} = 168.961$ ($p< 0.001$), CFI = 0.977, TLI = 0.968, and RMSEA = 0.051 (with 90% confidence interval [0.039 0.063]).

Table 2. Properties of Measurement Scales

Reliability	Factor loading		Correlation					
			1	**2**	**3**	**4**	**5**	**6**
1.SubjectiveNorms (α =0.844)	SN1 SN2 SN3	0.862 0.677 0.884	1					
2.PerceivedUsefulness (λ =0.855)	PU1 PU2	0.880 0.849	0.528	1				
3.PerceivedEase of Use (λ =0.846)	PEoU1 PEoU2	0.934 0.784	0.312	0.329	1			
4.Perceived Enjoyment (α = 0.780)	PE1 PE2 PE3	0.725 0.799 0.698	0.575	0.778	0.421	1		
5. Attitude (α = 0.859)	Att1 Att2 Att3	0.817 0.814 0.827	0.597	0.637	0.512	0.673	1	
5.BehavioralIntention (α = 0.924)	BI1 BI2 BI3	0.884 0.866 0.940	0.619	0.486	0.257	0.511	0.636	1

In order to assess internal consistency reliability, we computed Cronbach's alpha (α) coefficients for the constructs with three items and Guttman's split half coefficients (λ) for the constructs with two items. The reliability of each construct was better than the recommended cut-off value of 0.7 (Nunnally 1978).
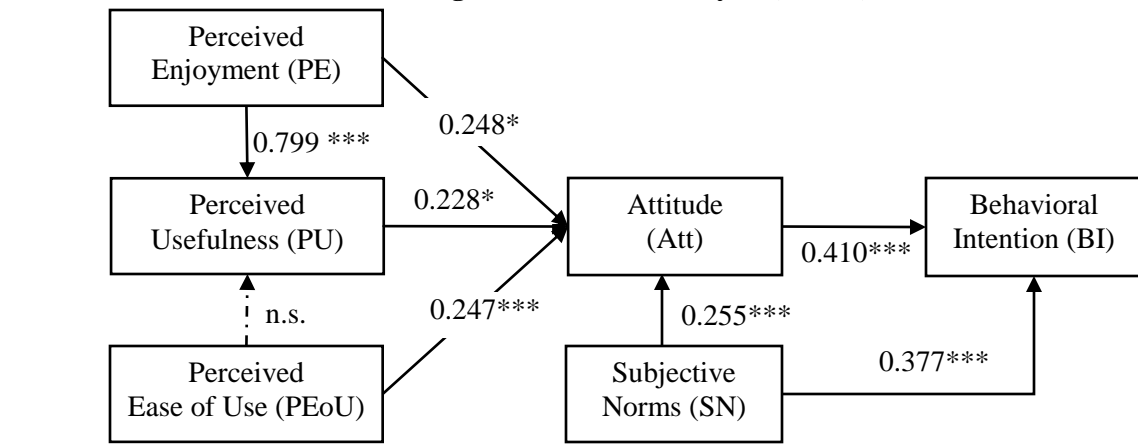
The correlations between each pair of factors were less than the cut-off value ($r<0.85$) and the correlations between items from different constructs were significantly lower than the correlations between items from the same construct, supporting discriminant validity. The properties of the reliability test, factor loadings of each item, and the correlation matrix among latent variables are listed in Table 2.

4.3 Result of Model Analysis

A structural equation analysis technique was used to validate the proposed research model using AMOS (Arbuckle and Wothke 1999). The model fit indices with a total sample (N=346) indicated that the model fit was satisfactory: $\chi^2_{(93)}$=176.300 ($p < 0.001$), TLI = 0.968, CFI = 0.976, and RMSEA = 0.051. An evaluation process was conducted by inspecting the significance of regression coefficients. All the hypothesized causal paths were significant except for the path from PEoU to PU. PE ($\beta = 0.248$), PU ($\beta = 0.228$), and PEoU ($\beta = 0.247$) evenly influenced Att. PE was an important contributor for perceived PU ($\beta = 0.799$). SN influenced BI directly as well as indirectly via Att. The variance explained (R^2) of endogenous variables was also calculated. A total of 63.2% variances in PU, 59.0% variances in Att, and 49.2% variances in BI were explained by the specified constructs in the model. The standardized regression coefficients are shown in Figure 2.

Next, we examined whether any difference exists in factors influencing adoption of mobile banking service between current Internet banking service users and conventional channel users. If people currently use Internet banking as their primary banking service channel, why would they accept mobile banking? To better understand psychometric properties of people in mobile banking adoption contexts, the samples were divided into two groups based on their current primary banking channel and the structural equation model was separately tested for Group A and Group B.

Figure 2.Result of Analysis (N=346)

Significance levels:　***$p< 0.001$; **$p< 0.01$; *$p< 0.05$

For Group A, the fit statistics were very good: $\chi^2_{(93)}$=139.112 ($p = 0.001$), CFI = 0.976, TLI = 0.970, and RMSEA = 0.052. Group B showed the following model fit: $\chi^2_{(93)} = 155.482$ ($p< 0.001$), CFI= 0.958, TLI= 0.946, and RMSEA= 0.065. The result of parameter estimation showed that different factors were related to attitude formation for each group. For the people who primarily used Internet banking, PE and PEoU were important contributors for attitude formation while PU was not. For people who primarily used other channels, such as ATMs and branches, PU and PEoU significantly influenced Att toward mobile banking while PE did not. Across the groups, SN directly influenced BI. Meanwhile, SN's indirect influence on BI via Att was significant only for people who primarily used other banking channels. Lastly, PE, unlike PEoU, was significantly related to PU, and Att was a good predictor for BI for both groups. The estimated standardized parameter coefficients for each group are shown in Table 3.

Table 3. Result of Structural Equation Model Estimation for Each Group

Path	Group A (N=185)	Group B (N=161)
PU →Att	0.164	0.340*
PEoU→Att	0.308***	0.223**
PE →Att	0.435*	-0.037
PEoU→ PU	0.037	-0.051
PE → PU	0.789***	0.806***
SN →Att	0.058	0.486***
SN → BI	0.466***	0.263*
Att→ BI	0.389***	0.415***

Significance levels: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

5. Discussion and Implications

Mobile banking service benefits businesses due to the reduced cost per transaction, which is less than a fifth of the cost of face-to-face transactions (BusinessWeek2004). Marketers may question what attracts customers to sign up for mobile banking services in markets where the majority of people have already set up Internet banking accounts or have been accustomed to conventional banking channels..

To understand perceptions of mobile banking, this study proposed perceived usefulness, perceived ease of use, perceived enjoyment, and subjective norms as predictors of intention to adopt the service, and empirically tested the hypotheses targeting its potential users. The results showed that the suggested four factors almost evenly contributed to attitude formation, and attitude and subjective norms affected behavioral intention. These results imply that both hedonic value and utilitarian values are critical for attitude formation toward mobile banking services. Specifically, perceived enjoyment was very strongly related to perceived usefulness and directly influenced attitude toward using mobile banking.

Meanwhile, as an individual's experiences influence the person's attitudes and behaviors (Fishbein and Ajzen 1975), previous banking service usage behavior may impact the person's attitude formation toward and adoption of a new banking channel. Thus, this study questioned whether the factors influencing attitude toward mobile banking would be same regardless of the primary banking service channel that a person used. Our analysis found these factors differed for people who used different primary banking channels.

For consumers who used Internet banking as their primary banking channel, the most important reason for adopting mobile banking was enjoyment, followed by ease of use. This result suggests that marketers should appeal to hedonic aspects of mobile banking even though the service was primarily developed for utilitarian purposes. Before the advent of mobile banking, Internet banking strongly impacted the financial industry. Because both Internet banking and mobile banking enable consumers to perform banking transactions whenever they want, current Internet banking users have already taken advantage of electronic self-service banking channels. Therefore, perceived usefulness is a less important factor in mobile banking adoption for current Internet banking users, assuming that both banking channels are compatible with each other. Instead, for Internet banking users, perceived enjoyment is more important than usefulness, in line with several previous studies of other mobile services (e.g. Nysveen et al 2005). They might believe that mobile banking would be fun since the service is delivered via a mobile phone instead of a personal computer. This finding suggests that marketers should target Internet banking users by developing marketing strategies that stimulate curiosity and stress the fun of using mobile banking.

In comparison, for consumers who mainly used conventional channels such as ATMs and branches, the most influential factors on attitude formation were subjective norms, perceived usefulness, and ease of use, in that order. Some of the conventional channels users might not have adopted Internet banking yet due to a lack of resources such as a personal computer or computer skills. If so, mobile banking could be a good option for them because it delivers high utilitarian value. Mobile banking can be perceived as easier to access and easier to use since it uses a personal mobile phone. Thus, to market mobile banking for conventional banking service users, businesses need to stress that consumers can make banking transactions regardless of time and location with just a few clicks on their phone. The results also indicated that usability of the service also matters for consumers who primarily used other banking channels as perceived ease of use significantly affected attitude.

Subjective norms in mobile banking adoption had different effects for people using different primary banking channels. While subjective norms directly influenced behavioral intention for both groups, its indirect relationship via attitude was insignificant for people who frequently used Internet banking. This result could be explained by the moderating effect of product category familiarity on the relationship between subjective norms and behavioral intention. Because mobile banking extends Internet banking to the wireless environment, people who currently use Internet banking primarily would feel more service familiarity with mobile banking than others do. Since familiarity leads people to depend more on their personal beliefs than on external factors for attitude formation (de Bont and Schoormans 1995; Park and Lessing 1981), an attenuated relationship between subjective norms and attitude is plausible for current Internet banking users. Karahanna, Straub, and Chervany (1999) also noted that in the initial adoption of a new product, consumers depend on others' opinions rather than on the characteristics of a new product due to a lack of product knowledge and previous experience. Meanwhile, direct influence of subjective norms on behavioral intentions remained significant across the groups, since humans, as cultural beings, are motivated to behave in ways that gain a favorable response from others (Hyman 1960).

This study indicates that the marketing communication for diffusing mobile banking needs to be differentiated for its potential users based on the type of banking channel they primarily use. Nevertheless, researchers should be careful when interpreting the results of this study. First, as the empirical study was conducted in Korea, the result of this study may differ from that of studies in other countries. The findings also may differ for countries with a different financial market structure. For example, Koreans frequently use electronic money transfer services for their personal transactions and transaction fees are less than one US dollar. In countries where service fees are expensive and people prefer to issue personal checks rather than wiring money, non-psychological factors may be important to attract people to a new service channel. Second, this study calls for more studies of conditions that facilitate mobile banking adoption as well as perceptions of the service in other countries. The current study mainly measured benefit perceptions such as usefulness, enjoyment, and eases of use and did not consider concerns that customers may have about adopting the new electronic service channel. As mobile banking services are delivered via a mobile phone, some may believe that their banking accounts are at risk if their mobile phone is stolen. Consumers may also be concerned about wireless transaction security (Luarn and Lin 2005). Thus, future researchers need to develop a more comprehensive model in order to understand mobile banking adoption behaviors more accurately.

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Appendix 1. Measurement Items

Measurement Items
Subjective Norms
SN1   People who influence my behavior would think that I should use mobile banking services.
SN2   My use of mobile banking services would be considered desirable by others.
SN3   My friends would think that I should use mobile banking services.
Perceived Enjoyment
PE1   Using mobile banking would give enjoyment to me for my banking transactions.
PE2   I would find mobile banking service to be enjoyable.
PE3   My interaction with a device for using mobile banking services would be enjoyable.
Perceived Usefulness
PU1   Using mobile banking services would enhance my effectiveness of utilizing banking services.
PU2   I would find mobile banking services useful to utilize banking services.
Perceived Ease of Use
PEoU1   Learning to operate devices to use mobile banking services would be easy for me.
PEoU2   I would find mobile banking services easy to use.
Attitude
Att1   Using mobile banking services is a good idea.
Att2   I like the idea of mobile banking services.
Att3   Using mobile banking services would be wise.
Behavioral Intention
BI1   I have intention to use mobile banking services in the near future.
BI2   I have a plan to use mobile banking services in the future.
BI3   I will use mobile banking services on a regular basis in the future