



# Applying the technology acceptance model in a two-country study of SMS advertising<sup>☆</sup>



Alexander Muk<sup>a,\*</sup>, Christina Chung<sup>b,1</sup>

<sup>a</sup> School of Journalism and Mass Communication, Texas State University-San Marcos, 601 University Drive, Old Main 230C, San Marcos, TX 78666, United States

<sup>b</sup> Anisfield School of Business, Ramapo College of New Jersey, 505 Ramapo Valley Road, Mahwah, NJ 07430, United States

## ARTICLE INFO

### Article history:

Received 1 July 2012

Received in revised form 1 February 2014

Accepted 1 April 2014

Available online 19 June 2014

### Keywords:

America

Attitude

Culture

Intention

Korea

SMS

## ABSTRACT

Short message service (SMS) allows marketers to interact directly with target consumers at specific times and locations via their mobile phones. Using a modified technology acceptance model, this study examines factors that influence consumers' acceptance of SMS advertising. Data were collected in the U.S. and Korea to test the conceptual model and the cross-cultural validity of the measurement scales. The findings suggest that these scales are valid in the two national contexts. The usefulness construct is important to establish consumers' favorable attitudes toward acceptance of SMS ads in both countries. Young Korean consumers' attitudes toward SMS ads are more positive than their American counterparts. Although social influence has no effect on Korean consumers' attitudes toward acceptance, it does show a positive relationship with American consumers' attitudes. This study reveals that consumers' acceptance of SMS ads does differ in the two culturally distinctive countries.

© 2014 Elsevier Inc. All rights reserved.

## 1. Introduction

The growing importance of the mobile phone as a new direct interactive medium in mobile media is in its portability and capability to function as a small computer. Based on mobile phone users' demographic information and usage patterns, advertisers can deliver personalized marketing messages to users via their mobile phones at specific times and locations (Peters, Amato, & Hollenbeck, 2007).

To gain a better understanding of the effectiveness of mobile marketing, a cross-cultural approach may help identify important factors that influence consumers' perceptions of mobile advertising. This study selects American and Korean consumers for comparison because of their distinctive cultural differences as well as their propensities to accepting mobile marketing.

Mobile phone penetration rates in the U.S. and Korea are over 90%. In 2011, mobile advertising spending in America and Korea reached \$1 billion and \$322 million, respectively (eMarketer, 2012). International marketers have already integrated mobile technologies in the media-mix to build brands because using permission-based mobile advertising can capture consumers' attention

and raise brand awareness (Okazaki & Taylor, 2008; Yunos, Gao, & Shim, 2003).

Cultural values are important factors that influence consumers' innovative behaviors of accepting technology-related products (Steenkamp, Hofstede, & Wedel, 1999; Straub, 1994; Veiga, Floyd, & Dechant, 2001; Yaveroglu & Donthu, 2002). Short message service (SMS) is a mobile application that allows users to communicate with text messages. Rapid adoption of SMS by consumers allows advertisers to interact with them via personalized marketing messages.

Through a better understanding of what influences consumers' acceptance of mobile advertising across cultures, international marketers can develop effective strategies that make SMS advertising more relevant to the target audiences' needs. This study will address the following two research questions. RQ1. Does adoption of SMS technology influence consumers' attitudes toward acceptance of SMS advertising? RQ2. Do the attitudes toward use vary in different countries?

Few empirical studies have used the technology acceptance model (TAM) to examine consumers' acceptance of SMS advertising. This study focuses on how the perceived ease of use, perceived usefulness and social influence affect consumers' attitudes toward acceptance of SMS advertising and the relationship between attitudes and intention to use. By comparing American and Korean consumers' attitudes toward SMS ads and intentions to use SMS advertising, this study also examines cross-cultural scale validity. In addition, the findings may provide advertisers a better understanding of the impact of cross-cultural differences on consumers' adoption of SMS advertising.

<sup>☆</sup> The authors appreciate the insights and guidance offered by the JBR editors and anonymous reviewers. Both authors contributed equally to the paper.

\* Corresponding author. Tel.: +1 512 245 1984; fax: +1 512 245 7649.

E-mail addresses: am40@txstate.edu (A. Muk), chung1@ramapo.edu (C. Chung).

<sup>1</sup> Tel.: +1 201 684 7310; fax: +1 201 684 7957.

## 2. Conceptual framework and theoretical model

### 2.1. Mobile advertising

Short message service (SMS) and wireless application protocol (WAP) are two commonly used mobile advertising platforms in Europe and America. WAP is a platform for multimedia message service (MMS). Fewer American consumers adopt WAP because of the high fees and poor connection speed (Cuneo, 2006). In Asia, SMS is a widely adopted mobile phone application (Kim, Park, & Oh, 2008) and it allows mobile phone users to send and respond to messages up to 160 characters. Seventy percent of American mobile advertising is sent via SMS (Bruno, 2006) as an advertising call-in system. Consumers can participate in consumer promotional activities or request mobile coupons by texting the advertisers. In early 2009, ten million mobile coupons were redeemed via mobile devices (Wortham, 2009). The American Wireless Advertising Association's guidelines require mobile advertisers to provide consumers with opt-in/out services for mobile ads. This permission-based model allows consumers to control when and where to receive SMS advertising via their mobile phones. However, prior research shows that most American consumers have no interest in receiving any kind of mobile marketing activities via their mobile devices (Reedy, 2009).

### 2.2. Technology acceptance model (TAM)

This study uses a modified technology acceptance model to examine consumers' intentions to use SMS advertising. The TAM derives from the theory of reasoned action (TRA), a behavioral model developed by Ajzen and Fishbein (1980). Originally, TAM was developed to examine user's adoption behaviors of computer information systems in the workplace (Davis, 1989) and then was extended to study new technology acceptance behavior in various technology-related research, including mobile marketing (Gefen, Arahanna, & Straub, 2003; Hong & Tam, 2006; Kim et al., 2008; Zhang & Mao, 2008). TAM postulates that users' adoption of information technology is determined by two technology-related attitudinal dimensions, namely, perceived usefulness (PU) and perceived ease of use (PEOU). According to Davis (1989), perceived usefulness and perceived ease of use would influence adopters' attitudes toward use which would in turn lead to intentions to adopt the technology. The central thesis of TAM is to predict an individual's behavioral intention. In addition to the original constructs proposed in TAM, social influence (SI) (Bagozzi, Wong, Abe, & Bergami, 2000) is incorporated in the model to study the effects of opinions of others on attitudes toward acceptance.

### 3. Hofstede's cultural dimensions

Consumers' adoption of an innovation is subscribed to the individual countries' cultural orientations. The societal norms and beliefs of a country would shape its people's perceptions, dispositions and behaviors (Steenkamp et al., 1999). Culture is a set of established values and beliefs that is shared among people within the same nation. Hofstede's (1997) cultural dimensions – individualism, uncertainty avoidance, masculinity and power distance – remain as the basis for a significant proportion of cross-cultural consumer research (De Mooij, 2010; Yaveroglu & Donthu, 2002). Past research reveals that people living in individualistic societies with a strong masculinity orientation are more innovative (Steenkamp et al., 1999). As noted earlier, the U.S. and Korea are selected for this study because of their different cultural characteristics in individualism and masculinity. According to Hofstede's (1997) cultural scores, the U.S. ranks 1st in individualism and 15th in masculinity while Korea ranks 43rd in individualism and 41st in masculinity.

In individualistic societies, ties between people are loose because they are more independent in attitudes and behaviors. Individualists

are motivated by self-interest and achievement of personal goals. Their decision-making process is internalized. In contrast, collectivists' behaviors are regulated by in-group norms that emphasize sharing, cooperation, and group harmony. Their decision process relies on external cues. In masculine societies, people tend to be more assertive, decisive, and ambitious (Hofstede, 1997).

### 4. Perceived characteristics of using SMS advertising

In the technology acceptance model, perceived ease of use (PEOU) refers to the degree of required effort that is needed to take advantage of an application (Davis, 1989). In this instance, a person expects the use of a technology will be free of effort. Compared to the standard computer keyboard, the small keypad on the mobile phone is not user-friendly. Sending and receiving text messages still require some mental effort (Dickinger & Kleijnen, 2008). In this study, the skills of sending SMS form the basis of developing items that measure the PEOU construct.

Perceived usefulness (PU) is the extent to which users expect the application of technology in their jobs will improve their performance. Lu, Deng, and Wang (2010) found that PU is a significant factor that influences consumers to adopt SMS. However, PEOU does not affect SMS adoption (Koufaris, 2002). In general, the utilitarian benefits of product attributes communicated via advertising are an important determinant of consumer response (Ducoffe, 1995). The perceived benefits of opting in to SMS advertising include convenience, discount coupons, and participation in consumer promotions.

These benefits are advertising values that are perceived as general cognitive antecedents of attitude toward advertising (Ducoffe, 1995). As the means-end-chain model (Mowen & Minor, 2001) suggests, the instrumental values of product attributes directly link with the terminal values of what consumers receive in using the products. In this instance, the utilitarian benefits of opting in to SMS ads provide a means to reach the desired end state of being rewarded. The utilitarian value that fits the construct definition of PU will be used to study its relationship with the attitude construct. An experimental study by Lee and Hill (2013) reveals that types of message influence utilitarian perception of mobile SMS. According to TAM, the belief variable perceived ease of use has a direct effect on attitude toward adoption as well as a mediated relationship through perceived usefulness.

#### 4.1. Adoption of SMS advertising

In consumer innovation diffusion, Gatignon and Robertson (1985) suggest that heavy users with significant experience in similar product categories are more responsive to new ideas. In Korea, redeeming SMS coupons for goods is very popular among young consumers where they even forward SMS coupons to their friends as gifts (Wortham, 2009). Thus, young Korean consumers' attitudes toward acceptance of SMS advertising may be influenced by their disposition toward using SMS as a tool to respond to advertising, as well as their experience in using the medium.

According to Sultan and Rohm (2008), factors that affect the effectiveness of mobile marketing include levels of mobile technology and penetration, regulatory constraints and levels of consumer acceptance in different cultural settings. Younger demographics higher in socioeconomic status are more responsive to SMS marketing (Trappey & Woodside, 2005). Adoption of innovation is faster in countries that have homogeneous national characteristics and highly concentrated populations (Dekimpe, Parker, & Sarvary, 2000). Korea represents a collectivist culture with a homogeneous population that is more group oriented, while the U. S. represents a more heterogeneous population with an individualistic orientation (Hofstede, 1997). One important difference between individualism and collectivism is the decision making process. Societies that value strong individualism attach importance to one's individual achievement and personal autonomy, thereby

promoting individual decision making over group consensus. Individualistic consumers with strong masculinity orientations are more assertive with their own behaviors. In contrast, people with collectivist behaviors rely more on external cues for making decisions and are more likely to accept opinions from peers or friends who interact frequently with them. Social influence reflects the perceived opinions of peers and friends (Mathieson, 1991). If peers see receiving SMS ads to be worthwhile and useful, friends are inclined to conform to peers' opinion, which should lead to a positive attitude toward accepting SMS ads. Prior research also suggests that there is a positive relationship between social influence (SI) and intention to use mobile services (Nysveen, Pedersen, & Thorbjornsen, 2005; Zhang & Mao, 2008). Social influence is incorporated into the theoretical model to examine its relationship with attitudes toward acceptance.

Research shows that the intrusion of SMS ads creates privacy concerns for mobile phone users (Grant & O'Donohoe, 2007). Establishing consumer trust is crucial because it influences several factors that are essential to the acceptance of SMS advertising including security and privacy. The permission-based model would alleviate the privacy concern because consumers would have control over their personal information while opting in to mobile advertising (Barwise & Strong, 2002). The intention to use SMS advertising is thus based on how much control consumers have on receiving it. In individualistic societies, people hold firm to their right to privacy. In contrast, invasion of privacy is permissible in collectivist cultures (Hofstede, 1997). American consumers are more concerned about privacy issues than their Korean counterparts because Asian consumers do not place high values on privacy (De Mooij, 2010). Instead of using Ajzen and Fishbein's (1980) conventional survey question on intention, which usually asks intention to act within a period of time, this study measures intention with items based on a permission-based model (Barwise & Strong, 2002). Based on the aforementioned discussion, a theoretical model is developed to examine the influence of culture on adoption of SMS advertising. See Fig. 1.

## 5. Method

The survey instrument for this study is adapted from Muk and Babin's (2006) study and the items are modified to address the constructs – perceived ease of use, perceived usefulness, attitudes toward acceptance, social influence, and intentions to use. Items were rated using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). Some items were coded in reverse to limit response-bias.

This study administered a cross-national survey to measure young consumers' receptiveness toward SMS advertising. The questionnaire was originally written in English and a back translation process was utilized (Brislin, 1986) for the Korean version. All items that matched precisely were retained after minor discrepancies had been resolved. In this study, the substantive knowledge about the constructs under examination fulfilled the equivalent requirement for comparative research (Douglas & Craig, 1983). Sample equivalence enhances the validity and reliability of measurement as well as controlling the exogenous

variables that might confound the research results (Douglas & Craig, 1983; Straub, 1994). Data were collected from college students in the U.S. and Korea using the convenience sampling technique. The sample frames are appropriate since college students in both countries are heavy users of mobile phone technology and they embrace SMS (Barnes, 2002). College age demographics have become a popular subject in mobile diffusion research (Castells, Fernandez-Ardevol, Qiu, & Sey, 2004).

The survey was administered in a classroom setting. A screening question asking respondents to name an advertiser from which they had requested promotional materials is included. The purpose of the screening question is to ensure that respondents have prior experiences with interactive advertising. All data collected were useable with no missing responses. Samples consist of 171 American university students and 131 Korean university students for a total of 302 respondents with 158 females and 144 males. Most respondents were between 18 and 24 years of age.

## 6. Findings

### 6.1. Overall measurement results

Cronbach's Alpha evaluates internal consistency. All measures demonstrate reliability with alpha values of .78 and greater. A Confirmatory Factor Analysis (CFA) was conducted to test the overall validity of the measurement theory. The CFA results show a good model fit for a 19-item model, with  $\chi^2 = 234.3$ ,  $df = 142$ ,  $p < .00$ ; Comparative Fit Index (CFI) = .98; Root Mean Square Error of Approximation (RMSEA) = .05; Normed Fit Index (NFI) = .94; and the Tucker-Lewis Index (TLI) = .97.

Further, construct validity is suggested based on the factor loading estimates, construct reliabilities, variance extracted percentages and inter-construct correlations (Hair, Black, Babin, Anderson, & Tatham, 2006). All loading estimates are significant ( $p < .00$ ) with the lowest being .61 and the highest being .95. The variance extracted estimates are .51, .60, .59, .84, and .75 for perceived ease of use, perceived usefulness, attitudes toward acceptance, social influence, and intentions to use, respectively. The construct reliability estimates are adequate, ranging from .81 to .95. Thus, the results support the construct validity of the measurement model (Hair et al., 2006). See Table 1.

### 6.2. Two-group measurement model

Prior to any comparison of the relationships between the variables of the proposed model, metric invariance between American and Korean responses is examined. In the measurement weights model, the measurement weights are constrained to be equal. The measurement intercepts are constrained to be equal in the third model; structural covariance is constrained in the fourth model; and the measurement residuals are constrained in the fifth model. All five models could be fitted to the data. When the two groups are fitted separately, there is no equality constraints imposed. Overall, the unconstrained or

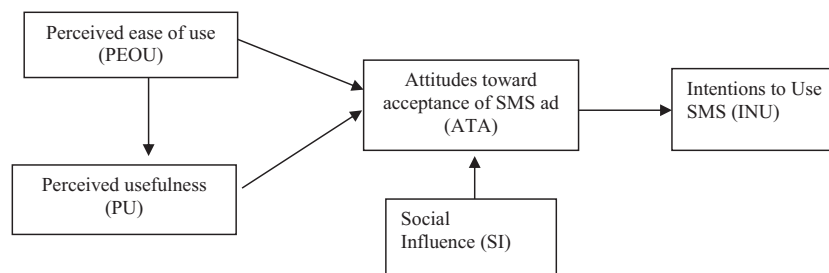


Fig. 1. The proposed model of attitude toward acceptance of SMS ads.

**Table 1**  
Standardized factor loading estimates.

		PEOU	PU	ATA	SI	INU
PEOU1	With regard to easiness, I believe opting in to SMS ads via cell phone is very easy.	.79				
PEOU2	With regard to mental effort, I believe opting in to SMS ads via cell phone is very effortless.	.79				
PEOU3	The task of sending text messages via cell phone is very simple.	.61				
PEOU4	The task of interacting with text ads via cell phone is very simple.	.65				
PU1	Using a cell phone to opt in to an SMS discount code would save me money.		.85			
PU2	Using a cell phone to opt in to a location-based ad alerts would make my shopping easier.		.83			
PU3	Using a cell phone to opt in to SMS ads would make me a smart consumer.		.76			
PU4	Participating in SMS promotional activities via cell phone would allow me to gain economic reward.		.68			
ATA1	All things considered, opting in to SMS ads via my cell phone would be very beneficial.			.67		
ATA2	I intend to opt in to SMS ads via my cell phone.			.67		
ATA3	All things considered, opting-in to SMS ads via my cell phone would be very good.			.93		
SI1	Most people who are important to me think I should opt in to SMS ads via my cell phone.				.92	
SI2	My close friends think I should opt in to SMS ads via my cell phone.				.95	
SI3	Most members of my family think I should opt in to SMS ads via cell phone.				.88	
SI4	My peers think I should opt in to SMS ads via cell phone.				.91	
INU1	If the opting-out mechanism is easy, I would use SMS ads.					.92
INU2	If mobile advertisers would offer privacy protection, I would use SMS ads.					.87
INU3	As long as I could opt out easily, I would use SMS ads.					.82
INU4	If signing up with mobile advertisers is easy, I would use SMS ads.					.86
Variance extracted		0.51	0.60	0.59	0.84	0.75
Construct reliability		0.81	0.86	0.81	0.95	0.92

PEOU (perceived ease of use), PU (perceived usefulness), ATA (attitude toward acceptance), SI (social influence), INU (intention to use).

“totally free” (TF) model fits reasonably well, with  $\chi^2 = 441.15$ ,  $df = 284$ ,  $p = .000$ ; CFI = .96; RMSEA = .04; PNFI = 0.67.

Constraining the measurement weights to be equal between groups, the model fit with  $\chi^2 = 468.77$ ,  $df = 298$ , CFI = .95; RMSEA = .04; PNFI = 0.69. The change in  $\chi^2$  by adding these constraints is 27.62 with 14° of freedom ( $p = .016$ ). The lack of fit is isolated to no more than a single covariance per construct meaning that partial metric invariance is established providing that ability to compare relationships between constructs. Further, the PNFI is higher for this model than the TF model. The added constraints do not significantly change the model fit ( $p < .01$ ) from the TF model ( $p < .001$ ). Adding the structural covariance does not result in a significant change in model fit from the measurement intercepts constraint model ( $p < .001$ ). Thus, the results at least satisfy the conditions for partial metric invariance allowing valid comparisons of relationships between the US and Korea samples (Lopez, Babin, & Chung, 2009). Next, the extent to which the construct covariance coefficients vary between samples is examined by comparing the factor loading equivalence model to a model constraining them to be equal between groups. The results indicate the model fit with  $\chi^2 = 747.47$ ,  $df = 332$ , CFI = .89; RMSEA = .07. The change in  $\chi^2$  by adding this constraint is 306.29 with 48° of freedom ( $p < .001$ ). The result is significant and suggests that the relationships observed in the U.S. sample are different than the relationships observed in the Korean sample. Table 2 shows the nested model comparisons results.

### 6.3. Two-group structural model

In structural equation modeling, the invariance of parameters across groups is tested by placing constraints on particular parameters (Bryne, 2010). First, an overall structural model fit for the two groups is

**Table 2**  
Comparative model fit results.

	Overall	USA	Korea	2-Groups	2-Groups	2-Groups	
	Sample	Sample	Sample	TF	LX = IN	PH = IN	TX = IN
$\chi^2$	234.29	218.86	222.23	441.15	468.77	747.44	640.19
$df$	142	142	142	284	298	332	317
CFI	0.98	0.96	0.95	0.96	0.95	0.89	0.91
RMSEA	0.05	0.06	0.07	0.04	0.04	0.07	0.06
PNFI	na	na	na	0.67	0.69	0.71	0.70

estimated without any constraints imposed. In this, as in subsequent analyses, the factor loadings, factor variance covariance matrices and the unique variances are allowed to be freely estimated across the two groups. Structural equation modeling (SEM) is conducted to examine the overall theoretical model specification. The one group model provides a satisfactory fit of data with  $\chi^2 = 327.48$ ,  $df = 147$ ,  $p = .000$ ; CFI = .95; RMSEA = .06; TLI = .94. See Fig. 2.

Next, the procedures turn to a test of moderation using the country classification variable. The structural invariance model is assessed by constraining all structural coefficients to be equal in both groups. Overall fit measures of the “totally free” model indicate that the model is consistent with the data ( $\chi^2 = 572.70$ ,  $df = 294$ ,  $p = .000$ ; CFI = .92; RMSEA = .06; TLI = .90). A structural model to be invariant across the samples indicates  $\chi^2 = 601.15$ ,  $df = 308$ ,  $p = .000$ ; CFI = .92; RMSEA = .06; TLI = .90. The chi-square difference 28.25 is statistically significant suggesting that the constraints of invariance on the structural parameters are unwarranted. Thus, the result presents evidence of moderation.

The SEM structural paths show that the constructs are positively related in both samples. The perceived usefulness – attitudes toward acceptance relationship is significantly stronger in the Korean sample ( $\beta = .71$ ,  $t = 5.7$ ) relative to the U.S. sample ( $\beta = .38$ ,  $t = 3.7$ ), while the attitudes toward acceptance – intentions to use relationship is slightly stronger in the U.S. ( $\beta = .65$ ,  $t = 6.3$ ) sample than in the Korean sample ( $\beta = .60$ ,  $t = 5.7$ ). There is no significant relationship between perceived ease of use – attitudes toward acceptance in both samples. The standardized path coefficients indicate that perceived ease of use is positively related to perceived usefulness ( $\beta = .43$ ,  $t = 4.6$ ) as well as social influence positive relationship with attitudes toward acceptance ( $\beta = .38$ ,  $t = 4.4$ ) in the U.S. sample. However, the relationship between social influence and attitudes toward acceptance and the relationship between perceived ease of use and perceived usefulness are not detected in the Korean sample. See Table 3. These results indicate that social influence is not a significant factor in measuring Koreans' attitudes toward adoption of SMS advertising.

T-tests are conducted to examine any differences in attitudes between American and Korean consumers. The results of  $t$ -tests indicate that significant differences of perceived usefulness ( $t(300) = 4.78$ ,  $p < .01$ ) and attitudes toward acceptance ( $t(300) = 3.84$ ,  $p < .01$ ) between Americans and Koreans. In addition to the research results, 61% of the U.S. respondents did not send any text messages in the last three days, whereas, only 3.8% of the Korean

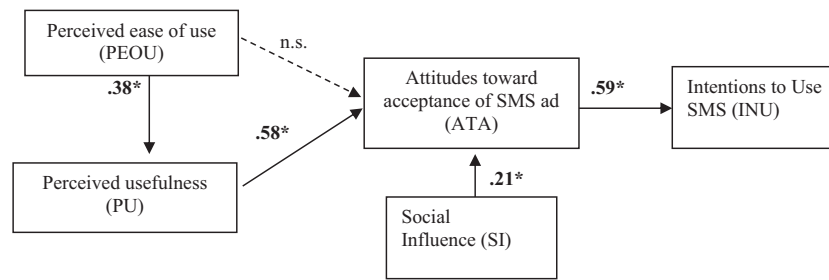


Fig. 2. The overall model of standardized coefficients.

respondents did not engage in such activity. Korean respondents embrace SMS technology more than their American counterparts.

## 7. Discussion and conclusion

The findings provide initial evidence to answer the two research questions. Acceptance of SMS technology and a nation's culture do influence young consumers' attitudes toward opting-in to SMS advertising. Overall, the results show that perceived ease of use is significantly related to perceived usefulness and positive attitude toward SMS ads is significantly related to perceived usefulness and social influence. In addition, attitude toward SMS ads is positively related to intention to use SMS ads.

Another important finding of this study is that Korean respondents' attitudes toward acceptance significantly differ from those of the U. S. respondents. For Korean consumers, perceived usefulness is the only key factor that influences their attitudes toward accepting SMS ads. Social influence and perceived ease of use have no effect on Koreans. However, social influence directly affects Americans' attitudes toward acceptance of SMS advertising and perceived usefulness mediates the effect of the perceived ease of use relationship on Americans' attitudes. These interesting relationships should be investigated further. The perceived usefulness, perceived ease of use and attitudes toward acceptance mean scores of the Korean sample are higher than those of their American counterparts. The results imply that young Koreans' perceptions toward the new ad medium seem more positive than their American counterparts. This tendency may ascribe to the intensity of SMS marketing implemented by Korean advertisers in recent years (Wortham, 2009).

However, the relationship between attitudes toward acceptance and intention to use shows no significant difference among the two samples. The convergence hypothesis of modernization is a plausible explanation for this outcome (Segall, Dasen, Berry, & Poortinga, 1990). Korea, a modern economy, has converged on some common ground in youth values, more so than the modern Western values. In most cultures, individuals may exhibit both idiocentric (individualist) and allocentric (collectivist) behaviors depending on their personalities (Gregory, Munch, & Peterson, 2002). As De Mooij (2010) points out, affluence and the influence of Western media may shift a country's culture from collectivism to individualism. In recent times, the effects of economic growth and

the influx of Western media into Korea have developed more individualism in young Koreans (Park, Nelson, & Mcleod, 2004). Young Koreans may rely more on their attitudinal beliefs and personal experiences to evaluate the consequences of accepting SMS advertising.

The theoretical model for this study is formulated based on five fundamental determinants: perceived usefulness, perceived ease of use, and social influence to measure attitudes toward acceptance, as well as the relationship between attitudes toward acceptance and intention to use. Another important aspect of this research involves testing the cross-national validity of the acceptance of SMS advertising scales. Findings suggest that these scales are valid for use in cross-national research and are applicable for comparing the differences between countries. The results of this study support prior research (Bagozzi et al., 2000; Lee & Green, 1991) that technology acceptance model is a robust model that can be applied to studies in other countries. This study has provided some preliminary evidence concerning the criteria that young American and Korean consumers use in order to evaluate SMS advertising. This finding is important in designing the interactive mechanisms of opting in to SMS advertising and in designing related marketing plans that will lead consumers to accept SMS advertising. American and Korean respondents' positive attitudes toward SMS ads are predominantly influenced by their own perceptions in terms of perceived usefulness. The positive attitude may increase intention to use if consumers have control over the delivery of SMS ads via their mobile phones. In this instance, the salient attributes in the attitude model are the values of SMS advertising. Mobile marketers may provide better incentives to increase consumers' positive perceptions of SMS advertising, as well as offer effective control mechanisms to prompt consumers to use SMS as a tool to respond to mobile advertising.

The generalizability of results drawn from university students' responses is limited. Diversified and non-student samples may provide adequate data and variability to explore how attitudinal components influence the acceptance of SMS advertising. Absolute conclusions of applying the technology acceptance model (Davis, 1989) to study attitudes toward SMS ads are not affirmed based on one cross-sectional survey involving only two countries. Korean students tend to avoid extremes and prefer responding around the middle points of the 7-point scales (Lee & Green, 1991). This scale measurement may undermine equivalence across the two samples.

The novelty effect of SMS advertising might have distorted the comprehension of the medium. Therefore, consider the classifications of constructs based on Davis (1989) TAM as an initial organization. Replications of the study are necessary. The results of this study suggest that both American and Korean respondents' attitude structures toward SMS ads are formed primarily based on their cognitive beliefs. Future research, capitalizing on different sources of attitude formation, should incorporate salient cultural values into the belief scales that measure adoption intention. Measuring cultural sensitivity and cultural adaptation on scales rather than via the assumption based on established cultural indices is a stronger approach that helps increase the understanding of what affects consumers' adoption of SMS advertising across different countries.

Table 3  
Comparisons of standardized coefficients and t-values between constructs.

	Standardized coefficients				t-Values	
	USA		Korea		USA	Korea
PU ← PEOU	.43	$p < .001$	.16	n.s.	4.55	1.45
ATA ← PEOU	.15	n.s.	.13	n.s.	1.66	1.55
ATA ← PU	.38	$p < .001$	.71	$p < .001$	3.66	5.68
ATA ← SI	.38	$p < .001$	.14	n.s.	4.37	1.87
INU ← ATA	.65	$p < .001$	.60	$p < .001$	6.29	5.69

Research into acceptance of SMS ads may be exploratory further in the consumer needs area. Is accepting SMS ads a hedonic need or utilitarian need? Investigating the experiential and sensorial aspects of the interactive medium may provide mobile marketers with a better understanding of the relationships between consumers and the values they give to this type of consumption experience. Future researchers may also choose to replicate this study by using countries other than those under examination here or may perform a similar study in order to explore the relationship between culture and acceptance of other types of mobile marketing.

This study makes an important contribution toward identifying differences in the determinants of consumers' attitudes toward acceptance of SMS ads. In this study, the invariance of parameters was tested and the results support appropriate validity and reliability, and an overall structural model fit. The findings also show that perceived usefulness is an important construct for explaining consumers' attitudes toward adopting SMS ads. Propositions presented in this study provide mobile marketers with insight into employing SMS technology as an advertising medium.

## References

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Bagozzi, R., Wong, N., Abe, S., & Bergami, M. (2000). Cultural and situational contingencies and the theory of reasoned action: Application to fast food restaurant consumption. *Journal of Consumer Psychology*, 9(2), 97–106.
- Barnes, S. (2002). Wireless digital advertising: Nature and implications. *International Journal of Advertising*, 21(3), 399–420.
- Barwise, P., & Strong, C. (2002). Permission-based mobile advertising. *Journal of Interactive Marketing*, 16, 14–24.
- Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner, & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137–164). Beverly Hills, CA: Sage.
- Bruno, A. (2006). Ads do mobile 2006. Retrieved February 15, 2009 from <http://www.allbusiness.com>
- Bryne, B.M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. (2nd ed.). New York, NY: Routledge.
- Castells, M., Fernandez-Ardevol, M., Qiu, J. L., & Sey, A. (2004, October). The mobile communication Society: A cross cultural analysis of available evidence on the social use of wireless communication technology. *A report presented at the International Workshop on Wireless Communication Policies and Prospects: A global perspective*. Los Angeles, California: The University of Southern California.
- Cuneo, A. (2006). *Not into mobile search? Just wait a couple years*. Advertising Age (Retrieved 28 August, 2009 from [http://www.adage.com/print?article\\_id=11529](http://www.adage.com/print?article_id=11529)).
- Davis, F. D. (1989, September). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 318–339.
- De Mooij, M. (2010). *Global marketing and advertising: Cultural paradoxes*. Thousand Oaks, CA: Sage.
- Dekimpe, M., Parker, P., & Sarvary, M. (2000). Globalization: Modeling technology adopting timing across countries. *Technological Forecasting and Social Change*, 63, 25–42.
- Dickinger, A., & Kleijnen, M. (2008). Coupons going wireless: Determinants of consumer intentions to redeem mobile coupons. *Journal of Interactive Marketing*, 22(3), 23–39.
- Douglas, S. P., & Craig, S. (1983). *International Marketing Research*. Englewood Cliffs: Prentice Hall.
- Ducliffe, R. (1995). How consumers assess the value of advertising. *Journal of Current Issues and Research in Advertising*, 17(1), 1–18.
- eMarketer (2012). US on track to become top mobile ad market. Retrieved 2 August, 2012 from <http://www.emarketer.com/Atricle.aspx?R=1009232>
- Gatignon, H., & Robertson, T. (1985, March). A prepositional inventory for new diffusion research. *Journal of Consumer Research*, 11, 849–867.
- Gefen, D. G., Arahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51–91.
- Grant, I., & O'Donohoe, S. (2007). Why young consumers are not open to mobile communications. *International Journal of Advertising*, 26(2), 223–246.
- Gregory, G. D., Munch, J. M., & Peterson, M. (2002). Attitude functions in consumer research: Comparing value-attitude relations in individualist and collectivist cultures. *Journal of Business Research*, 55, 933–942.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Hofstede, G. (1997). *Cultures and organizations: Software of the mind*. London: McGrawHill.
- Hong, S., & Tam, K. (2006). Understanding the adoption of multipurpose information appliances: The case of mobile data services. *Information Systems Research*, 17, 162–179.
- Kim, G. S., Park, S. B., & Oh, J. S. (2008). An examination of factors influencing consumer adoption of short message service (SMS). *Psychology and Marketing*, 25(8), 769–786.
- Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research*, 13, 205–222.
- Lee, C., & Green, R. T. (1991). Cross-cultural examination of the Fishbein behavioral intentions model. *Journal of International Business Studies*, 22(2), 289–305.
- Lee, H. H., & Hill, J. T. (2013). Utilitarian and hedonic perceptions of short message service mobile marketing. *International Journal of Mobile Communications*, 11(6), 597–616.
- Lopez, T. B., Babin, B. J., & Chung, C. (2009). Perceptions of ethical work climate and person-organization fit among retail employees in Japan and the US: A cross-cultural scale validation. *Journal of Business Research*, 62, 594–600.
- Lu, Y., Deng, Z., & Wang, B. (2010). Exploring factors affecting Chinese consumers' usage of short message service for personal communication. *20(2)*, 183–208.
- Mathieson, K. (1991). Predicting use intentions: Comparing the technology acceptance model with the theory planned behavior. *Information Systems Research*, 2, 173–191.
- Mowen, J., & Minor, M. (2001). *Consumer behavior: A framework*. Upper Saddle River, NJ: Prentice-Hall.
- Muk, A., & Babin, B. J. (2006). US consumers' adoption-nonadoption of mobile SMS advertising. *International Journal of Mobile Marketing*, 1(1), 21–29.
- Nysveen, H., Pedersen, P., & Thorbjornsen, H. (2005). Intentions to use mobile services, antecedents and cross-service comparisons. *Journal of the Academy of Marketing Science*, 33(3), 330–346.
- Okazaki, S., & Taylor, C. (2008). What is SMS advertising and why so multinationals adopt it? Answers from an empirical study in European markets. *Journal of Business Research*, 61, 4–12.
- Park, H. J., Nelson, M. R., & Mcleod, D. M. (2004). Beyond polarized cultural values: A new approach to the study of South Korean and US newspaper advertisements. *Advances in Consumer Research*, 31, 495–502.
- Peters, C., Amato, C. H., & Hollenbeck, C. R. (2007). An exploratory investigation of consumers' perceptions of wireless advertising. *Journal of Advertising*, 36(4), 129–145.
- Reedy, S. (2009, July/August). Mobile coupon go mainstream. *Telephony*, 30.
- Segall, M., Dasen, P., Berry, J., & Poortinga, Y. (1990). *Human behavior in global perspective: An introduction to cross-cultural psychology*. Elmsford, N.Y.: Pergamon.
- Steenkamp, J.-B. E. M., Hofstede, F. T., & Wedel, M. (1999). A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness. *Journal of Marketing*, 63(2), 155–169.
- Straub, D. (1994). The effect of culture on IT diffusion: E-mail and fax in Japan and the U.S. *Information Systems Research*, 5(1), 23–47.
- Sultan, F., & Rohm, A. (2008). How to market to generation M(obile). *MIT Sloan Management Review*, 49(4), 35–41.
- Trappey, R. J., & Woodside, A. G. (2005). Consumer responses to interactive advertising campaigns coupling short-message-service direct marketing and TV commercials. *Journal of Advertising Research*, 45(4), 382–401.
- Veiga, J., Floyd, S., & Dechant, K. (2001). Towards modeling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology*, 16, 145–158.
- Wortham, J. (2009, August 29). Coupons you don't clip, sent to your cellphone. *The New York Times* (Retrieved August 29, 2009 from <http://www.nytimes.com/2009/08/09/technology/29coupon.html>).
- Yaveroglu, I. S., & Donthu, J. (2002). Cultural influences on the diffusion of products. *Journal of International Consumer Marketing*, 14(4), 49–64.
- Yunos, M. H., Gao, J. Z., & Shim, S. (2003). Wireless advertising's challenges and opportunities. *Computer*, 36(5), 30–37.
- Zhang, J., & Mao, E. (2008). Understanding the acceptance of mobile SMS advertising among young Chinese consumers. *Psychology and Marketing*, 25(8), 787–805.