ADOPTION OF MOBILE TECHNOLOGIES FOR CHINESE CONSUMERS

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ABSTRACT

When it comes to mobile communication technology, China is the largest market in the world. However, due to its rapidly changing economic environment causing disparities between geographical regions, it presents unique marketing problems. In order to attain a better understanding of China as a potentially highly valuable mobile communication technology market, we conducted a survey of 221 Chinese nationals and tested a proposed conceptual framework based on UTAUT with moderating variables. The results from SEM multi-group analysis indicate that gender and education level are significant moderating factors while internet usage experience does not register as significant. The results of this research suggest the necessity to take cultural background and disposition into consideration for the UTAUT.

Keywords: Mobile Technology, Adoption, UTAUT, Chinese Consumer.

1. Introduction

The Chinese mobile industry has grown with incredible speed with 282 million cell phone subscribers at the beginning of 2004. This means that more than 25% of the new customers across the world mobile communication market are coming from China (CellularOnline 2004). According to Yan (2003) when considering that the diffusion rate of Chinese Internet use with only 49.7 million subscribers in 2002, 206.6 million subscribers in the mobile communication market in same year directly underscores the priority status of mobile technology. This also suggests a higher acceptance rate of wireless internet than of wired Internet in China. In this China-specific situation, in which mobile technology seems to supersede wired Internet technology, it is foreseeable that mobile technology would be the best venue for introducing e-commerce technology.

Up until 2004, the Chinese mobile communication market was dominated by two large companies, China Mobile and China Unicom. However, as China joins the World Trade Organization (WTO), this duopoly mobile market will be open for foreign operators from 2007. There are some indications that the mobile communication market has started to warm up to foreign rivals while the two domestic companies are losing their dominance to the Chinese mobile users (CellularOnline 2006). With the expected increasing competition in the Chinese mobile communication market in the near future, there is a need for systematic research on Chinese consumers in the mobile market. Making profits or even surviving in this largest but extremely competitive market may depend on an accurate understanding of Chinese mobile users, especially given China's unique cultural disposition and economic dynamics. Therefore, it is valuable to fill the gap of international dimensions in the field of mobile technology researches and to investigate how Chinese consumers in the largest world market behave and react to this newly adopted but rapidly diffused mobile technology.

For investigating Chinese consumers' technology acceptance process, this research adopted the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) with finding how the theory can be useful to explain Chinese adoption of the mobile technologies. UTAUT has been considered the most prominent and unified model in the stream of Information technology adoption research with high robustness of the

instruments regarding the key constructs (Li and Kishore 2006). Most of the previous studies were based on and conducted in developed countries, mainly in the United States and European nations. The legitimacy of applying standardized research methodologies and results from these western nations to understand the rapidly evolving Chinese mobile technology market is questionable (Zhang and Prybutok 2005). As noted by researchers, there is a need to test the models of IT acceptance in different cultural settings such as China because culture has been recognized as a significant construct impacting IT acceptance (Straub and Brenner 1997). Particularly, regarding attitudes toward mobile technology, Harris et al. (2005) emphasized a critical role of cultural factors and found significantly different usage patterns on attitude formations to various mobile services including SMS from Hong Kong and United Kingdom users even two countries have similar mobile technology infrastructures. Individuals are socialized early in life into a national culture with a group of values which influence what information is processed (Hofstede 2001). In particular, the moderating effect of variables introduced in the original UTAUT, such as gender, education and Internet experience, are expected to differ from the results of western market research because the nature of these moderators seems to be inherent in cultural settings. Thus, this research applies the extended UTAUT to the context of researching Chinese consumers' mobile technology adoption and seeks to identify the characteristics of Chinese consumer mobile adoption behaviors. A specific interest of this research is to investigate the effects of culturally driven moderating variables such as gender, education, and past experience of the Internet. As such, this research can anticipate related problems concerned with the challenges of managing technology acceptance in China with providing great understanding of mobile technology acceptance patterns.

2. Literature Review
2.1. Unified Theory of Acceptance and Use of Technology (UTAUT)
    Models for technology acceptance and adoption including the technology acceptance model (TAM) (Davis 1989), theory of reasoned action (TRA) (Fishbein and Ajzen 1975), and innovation diffusion theory (IDT) (Rogers 1995) have been established and tested extensively. More recently, through reviewing and empirically testing the technology acceptance models, Venkatash et al. (2003) proposed a unified model integrating acceptance determinants across several competing models. Referring to the UTAUT, Venkatash et al.'s model has been validated in empirical settings as having superior explanation power over past models. According to the UTAUT, intention to use the information technology (IT) can be determined by three antecedents: performance expectancy, effort expectancy and social influence and, as a consequence, intention to use is to exert influence on actual behavior toward IT adoption with facilitating conditions (Venkatesh et al. 2003). Specifically, performance expectancy measures how much people perceive a system, such as the Internet or mobile technology, is useful in achieving their goals in terms of job performance. The concept of performance expectancy, including perceived usefulness, has been considered the most powerful tool for explaining the intention to use the system regardless of the types of environments, be it mandatory or voluntarily. The other predictor which has been prevalently employed throughout technology adoption researches is effort expectancy, which explains how much people feel comfortable and find it easy to adopt and employ the system for their jobs. As far as the past experience in the Chinese mobile communication market, Yan (2003) pointed out that the Chinese seem to easily adopt basic and user friendly technology such as Short Message Service (SMS) rather than more advanced but less user friendly ones such as Wireless Application Protocol (WAP). With this point in mind, the Chinese are expected to attach more importance on effort expectancy than consumers from the other developed countries do.
    The last construct proposed as antecedents of the intention to use is social influence, i.e. the influence of others' opinions about a certain system adoption. The findings of the effect of social influence has been mixed through the investigations of several studies because the concept of social influence is likely to be complex while involving compliance related to social pressure such as subjective norms as well as identification related to self identity standing for social status gains (Venkatesh and Davis 2000). Given this, it has been noted that the effect of social influence depends on environmental characteristics such as mandatory or voluntary or in another perspective, individual base or organizational base (Hartwick and Barki 1994; Karahanna et al. 1999; Venkatesh and Davis 2000). More specifically, the compliance concept comes up in mandatory settings where other people's opinions weigh more to the inexperienced and conversely, the identification concept shows up in voluntarily settings where one is under social pressure to follow. According to Mao and Palvia's study conducted in Chinese cultural contexts (2006), the effect of the subjective norm with compliance concept was confirmed as significantly influential to intention to use the system under mandatory and inexperienced system environments. However, once the effect of the subjective norm is no longer able to be effective or if the nature of settings are changed into a voluntarily and experiential basis, the effect of self identity as status gain concept may dominate the influence to technology acceptance. From their empirical evidence, Mao and Palvia (2006) attested the enduring effect of self identity in technology acceptance models in post adopted and experienced technology accepted stages. Especially pertaining to the Chinese mobile

communication markets, a geographical and economic disparity exists despite the rapid overall acceptance rate (Zhang and Prybutok 2005). This disparity may be caused by relatively higher cost of cell phone calls rather than local calls as well as unbalanced infrastructures for using the wireless internet. Carlsson et al. (2006) tested the UTAUT pertaining to European mobile consumers and showed that performance expectancy and effort expectancy have significant power to explain intention to use mobile technology while social influence does not.. Different from the European markets, Chinese consumers are anticipated to tend to rely more on social influences given the diverse economic development in China where mobile phones are regarded as expensive (Zhang and Prybutok 2005) and mobile technology use is perceived as conspicuous consumption. Given the diverse economic and social conditions in China, it can be expected that social influence could be a significant facilitating factor forming positive attitude toward adopting mobile technology. Facilitating conditions refer to how people believe that technical infrastructures exist to help them to use the system when needed. As mentioned earlier, even though there is a certain disparity across geographies, big cities like Beijing, China, has been building its infrastructure for supporting mobile technology to a similar level to western countries (Tan and Ouyang 2004). Assuming this, the facilitating conditions can be adopted in the same fashion as it was employed for samples from the western countries. Although facilitating conditions were the only antecedent that was not significant in explaining behavioral intention in the original UTAUT by Venkatash et al. (2003), the later version of the UTAUT positioned behavioral intention as a direct response variable that, in turn, expects to exert influence on actual usage behavior. However, this research introduced the attitude toward mobile technology again based on the fact that China is in early adoption stage in terms of mobile communication technology and still utilized behavioral intention as a meaningful surrogate for behavior (Agarwal and Prasad 1999; Szajna 1996).

2.2. The Moderators in UTAUT

Four moderators including age, gender, experience, and voluntaries of use moderate the relationship in UTAUT, as reflecting individual differences. UTAUT proposed that gender would moderate the effect of performance expectancy, effort expectancy, as well as social influence. In terms of gender role, UTAUT expected males to be more likely to rely on performance expectancy when determining to accept a technology with his highly task-oriented nature. On the other hand, female's technology acceptance may be determined mainly by effort expectancy rather than performance expectancy under cognitions related to gender roles. This moderating effect of gender has been replicated by several studies in the area of technology acceptance in a variety of technologies like web-based shopping (Slyke et al. 2002), e-mail (Gefen and Straub 1997), Internet banking (Lichtenstein and Williamson 2006), and so on.

Lu et al. (2003), who attempted to build a theoretical model for the wireless internet based TAM, still expected that gender differences may lead to significant invariance between relationships in the technology acceptance process. As such, according to gender scheme theory that UTAUT applied as theoretical basis for gender moderating effect, as a female has the tendency to have concerns about others' opinions and interaction with others, she may form her attitude toward mobile technology with more reliance on social influence than males do. Several recent empirical researches investigated the gender differences in IT acceptance and usage shows that the expected gap between genders are diminishing as the technologies are more widely diffused (Zhou et al. 2007). Specifically pertaining to mobile technology acceptance, Bigne et al. (2005) found that men and women did not show significantly different behaviors in shopping through the mobile technology for users in Spain with 86% of penetration rate. However, when considering that the infiltration rate of the mobile technologies in China is about 20%, the possible moderating effects due to gender still exist. Venkatesh and Morris (2000) emphasized the importance and robustness of subjective norm in technology acceptance model where the effect of subjective norm may decrease in time as experiences related to the system are accumulated. About the mixed results of social influence in technology acceptance modeling, Lee et al. (2006) tested the extended technology acceptance model which divided social influence into subjective norm and self-identity about "internally generated role expectation." Within the Internet experienced and Internet inexperienced group, research supported that inexperienced people tend to simultaneously depend on subjective norm as well as self-identity. However, experienced people are more likely to be explained only by self-identity. Venkatash and Davis (2000) also supported this negative moderating effect of experiences on the relationship between subjective norm and perceived usefulness as the same concept with performance expectancy in UTAUT; however, they found out that experience tends to increase the influence of subjective norm on intention to use the technology. Li and Kishore (2006) tested how UTAUT is robust with university students in Hong Kong and found out that performance expectancy, effort expectancy, and social influence are evaluated to be invariant between gender groups. Conversely, there is significant invariance only in effort expectancy across groups according to the level of general computing knowledge that can be accumulated from past experiences about IT. With regard to Chinese consumers, Mao and Palvia's work (2006) about invariance driven by experiences in general Information technology or knowledge suggests that with higher level of experience

people will rely on performance expectancy when forming their attitude toward a technology. In china, mobile technology users are mainly predominated by the educated young generation (Tan and Ouyang 2004). Based on results from previous researchers that effort expectancy seems to be more important to people in earlier stages of adoption, people with lower education levels are anticipated to be more sensitive to this effort expectancy factor because this technology presents a sort of barrier to them (Szajna 1996; Venkatesh and Morris 2000). Agarwal and Prasad (1999) identified that several individual differences including level of education and extent of prior experience have significant effects on TAM's beliefs. As presented in Figure 1, this research hypothesized that;

H_1: *Performance expectancy positively influences attitude toward using mobile technology. This relationship may be moderated by gender, education, and past experiences with the Internet.*

H2: Effort expectancy positively influences attitude toward using mobile technology. This relationship may be moderated by gender, education, and past experiences with the Internet.

H_3: *Social influence positively influences attitude toward using mobile technology. This relationship may be moderated by gender, education, and past experiences with the Internet.*

H_4: *Facilitating conditions do not have significant influence on attitude toward using mobile technology.*

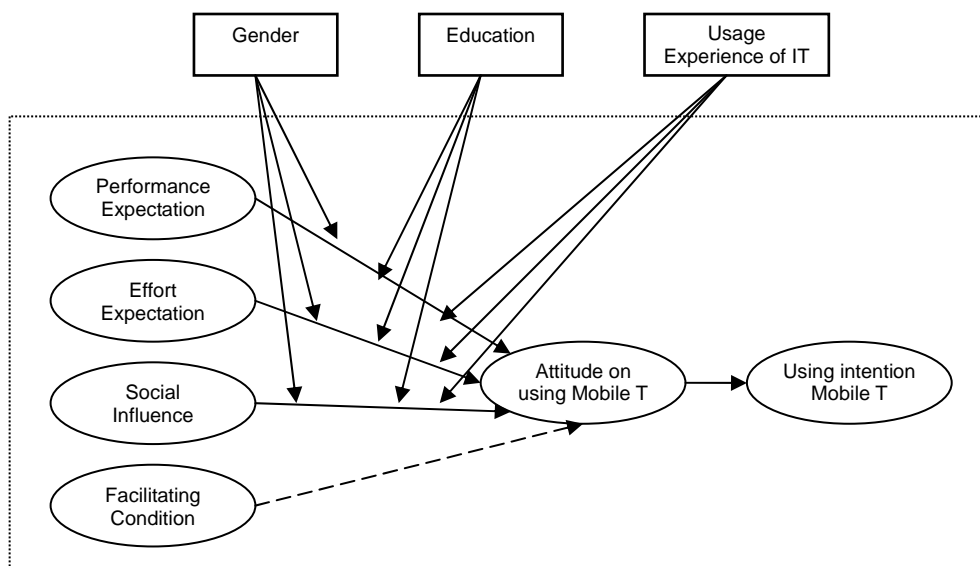*H5: Attitude toward using mobile technology influences intention to use mobile technology.*

Figure 1 Conceptual Framework

3. Method

3.1 Measurement and Data Collection

The measures in our framework were adopted from the original UTAUT work by Venkatash et al. (2003). The measurement items were based on a 7 point Likert scale from strongly disagree (= 1) to strongly agree (=7). Detailed information about measures was attached as Appendix A. A seven point Likert scale was employed for the attitude measure as well. The basic statistics for each measure and correlation between measures are represented in Table 1.

As recommended by researchers (Couper et al. 2001; Sills and Song 2002), the data were collected through the web from a Chinese online panel, which was bought from an online survey company. An email based self-administrated web survey can be used as an efficient and useful means to study consumer behaviors related to information technology such as the Internet and the mobile technology. As the target population was restricted to people owning any form of mobile communication technology, the use of this survey approach is therefore valid for the purpose of this study to examine consumers' technology acceptance process. Since the questionnaires had been developed by adopting the measurements from research written in English, this research went through back-translation processes following the recommendation by Brislin (1970). First of all, two graduate students who are fluent in both English and Chinese translated the English survey into a draft questionnaire in Chinese. Subsequently, two other graduate students who are bilingual translated the Chinese draft version back into English in order to validate its consistency with the original English version. After taking care of minor inconsistencies between the two English versions, the revised Chinese translated questionnaires were distributed to the targeted population through an e-mail invitation containing a link to the survey's web page. Totally, two hundred twenty one subjects participated in the online survey. In order to test for a substantial flaw which can be created when a survey

questionnaire is translated from English into Chinese, additional reliability analysis was conducted using Cronbach's alpha (α). Table 1 also shows the reliability coefficients, ranging from .68 to .87, above or around the accepted cutoff of .70 (Nunnally 1978).

Table 1 Means, Standard Deviation, and Construct Inter-Correlations

Variable Name / No. items	Mean	Standard Deviation	PE	EE	SI	FC	ATT	UI	Cronbach' alpha
PE/4	5.6790	.92802	1						.78
EE/4	5.2533	.93654	.387**	1					.81
SI/4	5.7892	.92565	.247**	.265**	1				.80
FC/4	4.3882	.80552	.108	.223**	.149*	1			.68
ATT/6	5.4900	1.00951	.346**	.309**	.362**	.138*	1		.87
UI/2	5.9788	1.09926	.174**	.280**	.463**	.197**	.336**	1	.70

PE: Performance Expectation EE: Effort Expectation SI: Social Influence FC: Facilitating Condition
ATT: Attitude on using Mobile UI: Using Intention of Mobile
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

3.2. Sample Characteristics

As shown from the basic analysis about usage patterns of mobile devices in Table 2, Chinese users tend to be new adopters of mobile technology who have possessed mobile devices for less than 1 year. This group accounts for about 58% of the sampled population. The mobile technology most in use in China was cell phone, which can be expected from the reviews of the Chinese mobile market. Chinese users in the mobile communications market predominantly use their mobile phones for sending SMS messages rather than adopting the other available complicated application technologies (Zhang and Prybutok 2005). The results show that Chinese mobile users tend to appropriate mobile device all over the place. An interesting observation is that the Chinese market accepted mobile devices instead of the Internet for the purposes of surfing the web, sending email, and text messaging as well. Chinese consumers have difficulties in using mobile technology representatively because of its prohibitive price, complicated technology, and lack of wireless internet accessibility. These baseline analysis results are consistent with the reports about Chinese mobile users that were examined by other researchers.

Table 2 Usage Patterns of Mobile Technology

Length of using Mobile	%	N	Types of Mobile	%	n
Less than 1 year	58.4	129	PDA	2.6	7
1 to 2 years	1.4	3	Wireless notebook	9.5	25
3 to 5 years	33.9	75	Portable GPS	5.1	14
6 to 8 years	4.1	9	Auto navigator	1.8	5
More than 8 years	2.3	5	Cell phone	67.2	184
			Others	13.9	38

Usual Places to use Mobile	%	N	Preferred occasion of Mobile	%	n
At home	28.3	302	Hotels	67.1	257
At work	15.5	166	Restaurants	49.1	188
During travel	17.3	185	Resorts	72.3	277
During daily commutes	29.6	316	Airports	36.0	138
Meetings away from the office	4.7	50	Airplanes	25.1	96
Only when away from hard wired-devices like desktop computer	4.7	50	Automobiles	44.1	169
			Recreation Facilities	50.9	195
			Outdoor Leisure Areas	65.5	251
			Business Areas	41.5	159
			Commuter train and subway	52.0	199

Factors Preventing from using Mobile			Usage Purpose of Mobile	%	n
Too expensive	38.4	336	Gaming	19.9	282
Unreliable	5.9	52	Voice and Instant Messaging	25.3	358
No product you like	4.3	38	Checking e-mail	12.6	178
No one else using the technology	4.0	35	Web surfing	10.9	154
Don't understand the technology	15.8	138	Directions/Maps	1.4	20
Lack of wireless service areas	16.5	144	Word Processing	13.4	190
Inconvenient	7.0	61	Calendar/Organizer	16.5	234
Others	8.1	71	Other	0	0

4. Results

4.1. UTAUT on the Mobile Technology

Hypotheses testing followed a two-step process. The first step included testing of the core attitudinal model, followed by the test of moderating effects using structural equation modeling (SEM) with AMOS 6.0 statistical packages. With regard to goodness of fit index, this research used several indexes simultaneously in order to assure model fit appropriateness. As shown in Table 3, the $\chi2/df$ value of 1.809 indicates a satisfactory level as it is below the recommended 3.0 (Bollen and Long 1993). Other representative indexes such as GFI and CFI were 0.913 and 0.915 respectively, which is above the generally accepted level of 0.9 (Hayduk 1987). At 0.061, the RMSEA is below the recommended cut-off level of 0.08 (Browne and Cudeck 1993). These accepted multiple fit indices allowed researchers to consider the results of the structural model analysis as an excellent fit of the proposed model to the data. Pertaining to the core attitudinal model, the relationship between antecedents such as performance expectation, effort expectation, social influence, facilitation conditions, and attitude toward using mobile devices are shown as consistent with the original model and support the hypotheses proposed in the proposed model. The model results are presented in Table 4. Specifically, the influences of performance expectation ($\beta = 0.320$; t-value = 3.456) and effort expectation on attitude toward using mobile device were significant and positive as hypothesized ($\beta = 0.196$; t-value = 2.931). Also as hypothesized, the effect of facilitation conditions on attitude toward mobile device usage is not supported statistically ($\beta = 0.086$; t-value = 0.834). However, social influence exhibits a significant influence on the attitude toward mobile technology ($\beta = 0.399$; t-value = 3.801) and is relatively strong when comparing to the other independent variables' effects. The relationship between attitude and behavior intention toward mobile technology was supported ($\beta = 0.442$; t-value = 3.463) at a 0.01 significance level.

4.2. Moderators

In order to investigate moderating effects, the current study followed the steps for examination of moderators as suggested by Dabholkar and Bagozzi (2002). The total sample was divided into high and low groups according to the median of individual trait factors including gender, education, and past experiences with the Internet (Yi and Jeon 2003). To see if moderating effects were present, this study followed Jöreskog and Sörboms directions (1993). Two tests for each high and low group were conducted for each variable, based on four corresponding models A B, C, and D differing according to the constraint levels that were grouped for each variable. Under Dabholkar and Bagozzi's recommendation (2002), the four models associated with multi-analysis using SEM are to be constrained in terms of error variances explained by latent variables and path coefficients between latent variables. Model A was constrained to be the same across the two models for both high and low groups in error variances and path coefficients. Model B only had path coefficients constrained and model D only error variances. With regard to model C, all path coefficients and error variances were constrained to be free across the two groups. Assuming that the pair of models for error variances such as A and D (B and C) is not significantly different, if the $\chi2$ differences between the other pairs of models such as A and B (C and D) are significant, then it can be considered that there are significant moderating effects across the low and high groups (Baron and Kenny 1986). According to Table 3, the result of $\chi2$ difference comparisons between pairs of given models provided evidence that there is significant difference between model A and model B in education for both high and low groups ($\Delta\chi2/\Delta df = 8.903$, p=0.064) as well as between model C and D in gender groups ($\Delta\chi2/\Delta df = 10.115$, p=0.039), suggesting significant moderating effects of education and gender. However, the moderating effect of past internet experiences could not be supported with insignificant differences in $\chi2$ over the change of degree of freedom ($\Delta\chi2/\Delta df = 1.536$, p=0.820). As hypothesized in the original model of UTAUT and this study, Table 4 indicates that male users tend to be influenced by performance expectation when forming their attitude toward mobile technology usage ($\beta_{Male} = 0.674$, t-value= 4.074; $\beta_{Female} = 0.006$, t-value= 0.052), while social influence was the most important factor shaping attitude towards using mobile device ($\beta_{Male} = 0.266$, t-value= 2.272; $\beta_{Female} = 0.323$, t-value= 2.310)). Additionally, the effect of effort

expectancy had relatively higher strength in the female group (β_{Male} = 0.195, t-value= 2.196; β_{Female} = 0.210, t-value= 2.146). With regard to education moderating effect, all of the antecedents including performance expectation, effort expectation, and social influence show stronger effects on explaining attitude toward using mobile technology in the low education group. In terms of the high education group, the influence of effort expectation appeared to be relatively weaker in the high education group ($\beta_{High\ education}$ = 0.181, t-value= 1.791; $\beta_{Low\ education}$ = 0.208, t-value= 2.401).

Table 3. Structural Equations Results for Moderating Effect Models

Basic Model		χ^2	df	RMSEA	GFI	CFI	$\chi^2/_{df}$	P[a]
		157.344	87	0.061	0.913	0.915	1.809	0.000
Moderating Variable	**Model**	χ^2	df	RMSEA	GFI	CFI	$\Delta\chi^2/_{\Delta df}$	P[a]
Gender	C	295.919	174	0.057	0.856	0.860	10.115	0.039
	D	306.034	178	0.058	0.851	0.853		
Education Level	A	321.359	185	0.047	0.849	0.851	8.903	0.064
	B	311.943	181	0.047	0.853	0.857		
Internet Experience	A	294.208	187	0.051	0855	0.877	1.536	0.820
	B	292.672	183	0.052	0.856	0.874		

a. Probability that the two models tested are significantly different.

Table 4. Structural Equations Results for Hypotheses

	Basic Model		**Moderating Model**							
			Gender				**Education**			
			Male		**Female**		**High**		**Low**	
	Estimates	**t-val.**	**Estimates**	**t-val.**	**Estimates**	**t-val.**	**Estimates**	**t-val.**	**Estimates**	**t-val.**
PE → ATT	0.320***	3.456	0.674***	4.074	0.006	0.052	0.164	1.476	0.502***	3.336
EE → ATT	0.196***	2.931	0.195**	2.196	0.210**	2.146	0.181*	1.791	0.208**	2.401
SI → ATT	0.399***	3.801	0.266**	2.272	0.323**	2.310	0.301**	2.147	0.429***	3.350
FC → ATT	0.086	0.834	0.197	0.898	0.174	1.263	0.172	1.174	0.135	0.790
ATT → UI	0.442***	3.463	0.428***	2.658	0.375**	2.375	0.430***	2.690	0.429***	2.901

PE: Performance Expectation EE: Effort Expectation SI: Social Influence FC: Facilitating Condition ATT: Attitude on using Mobile UI: Using Intention of Mobile
*** $p<0.01$ ** $p<0.5$ * $p<0.1$

5. Discussion

As the country possessing the largest number of mobile communication technology users and containing the most new adopters, China is anticipated to experience tough competition between global purveyors of mobile technology and services and their existent major domestic firms (China Economic Review 2006). As the largest and most promising emerging market for mobile communication technology, it is undeniable that China is an incredibly important market and deserves focused research attention especially in terms of consumer behavior. The potential of this market is evident even though the current Chinese mobile technology makes up the largest percentage of the world market; its penetration rate still remains only at 20.8%. When considering the fact that the penetration rate of the 20-40 age group appears near 100% in the US (Wireless World Forum 2006), the relatively low penetration rate of Chinese mobile communication technology market indicates that China has to be considered as at the beginning stage of mobile technology adoption. Under these circumstances, it is essential to investigate what motivates Chinese mobile device users to accept mobile communication technology and which specific users' individual trait factors influences these choices. With these information needs, this study's researchers decided to adopt the UTAUT introduced by Venkatash et al. (2003) while focusing on the moderating effect of users' personal factors: gender, education, and past internet experiences.

As expected from a review of the available literature, the basic model analysis showed a main effect of social

influence in explaining Chinese users' attitude toward mobile technology adoption. This result is consistent with the results from Mao and Palvia's work (2006) about Chinese consumers in which they confirmed the overpowering role of subjective norm in explaining intention rather than attitude. Even though they are still at the beginning stage of mobile technology adoption, the Chinese mobile users shape their attitudes more with performance expectation rather than effort expectation. Contrary to what was hypothesized, it is noted that the moderating effect of past experiences related to the Internet appears to be insignificant. However, these insignificant results with regard to moderating effect of past IT experiences can be easily understood in the context of China's present situation in which the diffusion rate for mobile technology is even faster than for the Internet as the representative mode of information technology. Given mobile technology's dominant diffusion, Chinese mobile technology users may not come from the identical population as the internet user population and, therefore, it is possible that they may not necessarily be familiar with Internet technology. With the exception of the insignificant moderating effect of past internet experience, gender and education demonstrated significant moderating effects on the relationships between the main antecedents and the attitude toward utilizing mobile technology devices. The moderating effect of gender was shown to be similar to the past results as reviewed in the earlier section. For example, males are more inclined to rely on performance expectancy rather than effort expectancy, whereas females respond oppositely. Females also have a tendency to put more importance on the role of social influence than males do when shaping their attitude toward mobile technology. Impressively, the UTAUT appears to be able to explain well the low education group's attitude forming process, while the UTAUT failed to explain successfully the high education group. Specifically, the results indicate that the high education group members mainly shape their attitude toward mobile technology with social influence. The insignificant role of performance expectancy, which was originally widely accepted as one of the most meaningful factors determining consumers' technology adoption especially for highly educated or highly skilled consumers, can be understood by looking at the stage at which the Chinese mobile technology industry actually has currently achieved. Because China is in a beginning stage (Yan 2003), the functions mostly utilized by Chinese mobile technology adopters are restricted to the simplest ones such as sending messages or limited surfing of the Internet. This is also due to the fact that the functions that Chinese mobile technology markets provide have been limited to comparatively simple ones like SMS rather than more complicated technology like WAP. When explaining this from the high education group's perspectives, as they tend to expect higher level of technologies to utilize with mobile devices, they do not really count on the performance expectancy of the mobile technology that they currently use when shaping their attitudes toward it. These invariant results again point to the need to extend and develop the UTAUT in order to explain consumers' new technology acceptance process while introducing other personal traits and cultural backgrounds into the model.

6. Implications and Limitations

Academically, in spite of increasing amount of general empirical researches in mobile technology, only a few researches have been explored in the field of the mobile technology with considering cultural factors (Okazaki 2005). From this standpoint, this research attempts to extend the understanding of individual differences when applying the UTAUT as the representative and powerful technology acceptance model to the Chinese users, and to understand the new IT acceptance process in relation to the mobile communication technology. This research on the Chinese mobile communication technology market has yielded different results from research on the western markets, especially when it comes to the main effects of social influence and insignificant moderating effects of past experience with the Internet. From a practical perspective, while the entire global economy is keeping its eyes on China as the world's fastest growing economy, the current study may provide a better understanding of Chinese consumers' mobile technology acceptance. The results presented in this research are expected to provide practical insights for businesses confronting difficulties in mobile technology diffusion in the Chinese market. It is important to realize that gender and education can significantly impact the Chinese mobile adoption attitude and diffusion rate. These findings, therefore, provide a valuable baseline for organizations to build efficient segmentation strategies based on the meaningful individual moderating factors such as gender and education, which is fitting in the Chinese cultural and economic context.

Even though this research partially validated the need to extending the technology acceptance model, this research is limited in terms of bringing other culturally driven factors specifically relevant to the Chinese consumer market beyond the individual factors that were suggested in the original UTAUT. Future research can, however, build upon the findings of this research and bring additional dimensions and culturally meaningful factors to the test ground of technology acceptance model. As this research was executed concerning commonly available mobile technologies including text messaging, emailing, voice mail, and data based services; it failed to differentiate consumer adoption of complicated mobile technologies like WAP from general and simple ones. Future researchers can develop research studies concerned with differentiating consumer adoption across levels of complicatedness of

mobile technologies.

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Appendix A

Measure	Researchers	Items
Performance Expectation		I would find mobile technologies useful in my travel. Using the mobile technologies enable me to accomplish travel tasks more quickly. Using the mobile technologies increases my productivity in travel. If I use mobile technologies, I will increase my chances of getting better travel.
Effort Expectation		My interaction with mobile technologies would be clear and understandable. It would be easy for me to become skillful at using mobile technologies for travel. I would find mobile technologies easy to use for travel. Learning to operate the mobile system is easy for my travel.
Social Influence	**Venkatesh et al. (2003)**	People who influence my behavior think that I should use the mobile device for travel. People who are important to me think that I should use the mobile device for travel. The senior management of this business has been helpful in the use of the mobile device for travel. In general, the organization has supported the use of the mobile device for travel.
Facilitating Conditions		I have the resources necessary to use the mobile device for travel. I have the knowledge necessary to use the mobile device for travel. The mobile device for travel is not compatible with other mobile device for travels I use. A specific person (or group) is available for assistance with mobile device for travel difficulties.
Attitude on using mobile		Travel with Mobile Device is: Bad/Good, Inferior/Superior, Unpleasant/Pleasant, Boring/Interesting, Poor/Excellent, Not Worthwhile/Worthwhile
Using intention	**Venkatesh et al. (2003)**	I intend to use the mobile device for travel in the next <n> months. I predict I would use the mobile device for travel in the next <n> months.
Usage experience of IT		How long have you been using the Internet? How many hours, in total, do you personally surf / browse the Internet for work or personal reasons in an average week?