The Gratification Driving User Attitude and Continuance Use of Mobile Payment Services in China

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Abstract: Purpose/Meaning: This study aims to investigate the impact of gratification on users' attitudes and continuance use of mobile payment services in China. Process/Method: Data was collected from conveniently sampled 200 users of mobile payment services in China. A questionnaire, which mainly contains five-point Likert scale questions, was used to collect the data. The study adopted the Uses and Gratification (U&G) theory and was analyzed with the Structural Equation Modelling. Result/Conclusion: The findings show that cognition gratification, convenience gratification and usefulness gratification can significantly impact users' attitudes towards mobile payment services. In addition, user attitudes can also significantly influence the continuance use intention of mobile payment services.

Keywords: Mobile payment, Gratification, User attitude, Continuance use, Technology acceptance behavior.

1 INTRODUCTION

Due to the ubiquitous characteristic of mobile devices, a variety of new financial services have created [6, 13]. For fintech services in developing economies, the mobile payment service market is often the fastest growing segment due to its convenient payment characteristics [15]. Mobile payment uses the mobile communication terminals and device to conduct bank transfer, payment, shopping and other transaction activities through the SMS (short message service), IVR (the interactive voice), WAP (wireless application protocol) and many other communication methods. As a new payment method, mobile payment has the advantages of convenience, security and reliability.

According to Chinese Ministry of Information Industry, there were 547 million mobile phone users in China in 2007, ranking first in the world. In China, the application scenarios of mobile payment are also constantly enriched, from daily bill payment to banking business, from public transportation to wealth management and shopping, all can be completed through mobile payment. Payment forms are also increasingly diversified, whether it is fingerprint payment or face-scanning payment, which makes consumption more convenient.

Although mobile payment services have become a hot topic in academia, there is little research on whether and how users' usage behaviors change after they first adopt mobile payments. [6, 25]. To fill the gaps in the previous literature, this study chose to adopt the use and

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gratification theory (U&G) [14] to identify various key factors that improve users' attitudes towards mobile payments and drive continuance use in China.

2 LITERATURE REVIEW

2.1 Use and Gratification Theory

Use and Gratification Theory is a way used to help understand how individual adopt and use technology [11], which is proposed on the basis of technology acceptance model, computer use model, incentive model, rational behavior and planned behavior theory. U&G theory states that individuals will obtain or seek gratification when they use their preferred media channels. The gratification is generally recognized as the potential benefits of using the medium when individuals choose a channel [20, 21]. When users are satisfied after using a particular medium, they have a positive attitude towards the medium and vice versa, which affects their willingness to choose that medium again in the future [18]. The literature suggests that user gratification categories include gratification from information acquisition and understanding of the surrounding environment (Cognition), gratification from pleasant experiences (Hedonic), gratification sought from enhanced trust, personal gratification Trust, connection with friends and family (Integration) [5, 12].

2.1.1 Cognitive

Cognitive gratification is defined as "the degree to which people believe that using a particular system can improve their performance" [8]. Venkatesh et al. (2012) also refer to it as performance expectation. There were already researchers found that cognitive gratification is related to product and event information, curiosity, consultation and knowledge acquisition [24]. There was a study find that there is a significant correlation between cognitive gratification and mobile payment technology, which is embodied in the positive impact of cognitive value on users' acceptance of mobile payment [25]. In addition, Chang et al. (2016) also found that users' attitudes towards mobile payments can be significantly impacted by utilitarian gratification.

2.1.2 Hedonic

Extant literature refers to hedonic gratification as the gratification of enhanced pleasure experiences. There is a strong correlation between hedonic gratification and stress release needs [31]. There were also studies found that hedonic gratification is related to the reduction of boredom and pleasure [30]. According to these studies, Ha et al. (2015) found that hedonic gratification played an important role in impacting Korean users' attitudes towards using social networking sites. Likewise, Azam (2015) stated that, in Saudi Arabia, hedonic gratification can directly influence students' attitudes towards website use. However, Ozturk et al. (2017) argued that mobile payments will only bring functional benefits to users, which is the reason that different studies disagree on hedonic gratification.

2.1.3 Convenience

Dewan and Chen (2005) believed that the innovative and high-tech nature of mobile payments may bring convenience to users. According to extant research, convenience has been

unanimously recognized as an important factor impacting users' attitude towards mobile payment [15, 28]. This view is also supported by a study by Ozturk et al. (2017) on user acceptance of mobile payment technologies. They believe that users who feel the convenience of using mobile payments are more willing to use this technology.

2.1.4 Ease of Use

Perceived ease of use refers to the degree to which a person thinks that using a technology can save effort [8]. After being widely implemented and validated, ease of use gratification emerged as an important factor in explaining the use of the technology [3, 16]. Furthermore, Mun et al. (2017) found that ease of use gratification is an important factor influencing mobile payment services for millennials. In 2013, Shaw also conducted a study of the use of mobile wallets by Canadian business school students. However, according to the study setting, ease of use gratification had no positive effect on intention to use a mobile wallet (Shaw, 2014).

2.1.5 Usefulness

Subsequent literature has demonstrated that usefulness gratification is an important factor affecting users' attitudes toward technology use [3, 35]. In China, perceived risk is a key factor for users to judge the usefulness of a technology. Based on high-speed communication technologies, mobile payment has supported smart devices to conduct real-time data collection and comparative analysis of personal biometric characteristics, including face and fingerprint. The trusted computing technologies create has enhanced users' trust to mobile payment, which also increase the usefulness of mobile payment technologies.

2.2 Attitude of Mobile Payment

Ajzen (2001) refers to attitude as a total score of mental state, which captures dimensions such as good and bad, beneficial and harmful, pleasant and unpleasant. There have been studies to explore how attitudes influence user' behavior. For example, Phonthanukititthaworn et al. (2015) discussed the impact of utilitarianism on attitudes towards mobile payment usage. Additionally, other studies suggested that actual usage behavior can be affected by the attitude whether it is positive or negative [7, 25]. Although there have been studies which confirmed the influence of attitude at first use on user acceptance in the field of mobile payments [10, 19, 29]. However, there are few studies examining the impact of attitudes on continuance use of mobile payments.

3 RESEARCH METHODS AND MATERIALS

The research about "The Gratification Driving User Attitude and Continuance Use of Mobile Payment Services" is a quantitative study using online questionnaires as a data collection tool and analyzed by statistical procedures.

3.1. Research Framework

According to the theoretical framework of previous research, we can construct the conceptual framework of this research through 7 variables, which are Cognitive Gratification (CG), Hedonic Gratification (HG), Convenience Gratification (CO), Ease of Use Gratification (EG),

Usefulness Gratification (UG), Attitude of Mobile Payment(AT) and Continuance Use(CU). And the framework is shown as Figure 1.

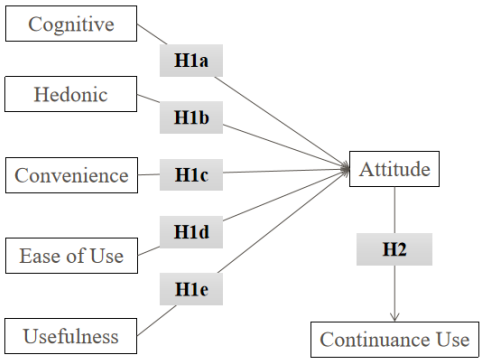

Figure 1: Conceptual framework

From the conceptual framework, the hypothesis of the variables are:

H1a: Cognitive Gratification is significantly impacting on user attitude of mobile payment in China

H1b: Hedonic Gratification is significantly impacting on user attitude of mobile payment in China

H1c: Convenience Gratification is significantly impacting on user attitude of mobile payment in China

H1d: Ease of Use Gratification is significantly impacting on user attitude of mobile payment in China

H1e: Usefulness Gratification is significantly impacting on user attitude of mobile payment in China

H2: User attitude of mobile payment is significantly impacting on Continuance Use of mobile payment in China

3.2. Research Methodology

3.2.1 Sample and Data Collection

In this study, the proposed data collection tool is to conduct a questionnaire survey through the online platform "Questionnaire Star". The questionnaires were distributed to the target population using the non-probability method of convenience sampling technique in this study.

The questionnaire used in this study was derived from a questionnaire adapted from Alhassan et al. (2020). Consists of 3 parts with 35 questions, of which 2 screening multiple-choice questions aim to identify target respondents, 3 demographic multiple-choice questions aim to collect demographic data on mobile payment users in China, and 30 five-point Likert scales The questions were designed to collect data on factors influencing user gratification, attitudes

towards mobile payments, and continued willingness. The Likert scale consists of 5 scales, 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is strongly agree, and 5 is strongly agree.

The target population of this study is the total users of mobile payment in China.

A widely used minimum sample size estimation method is the "10-times rule" method [26]. The "10-times rule" emphasizes that the minimum sample size of a study should exceed "10-times" the maximum number of internal or external model links that lead to any structure. Therefore, the minimum sample size required for this study is 50 respondents. A total of 212 questionnaires were distributed in this study, which met the minimum sample size requirements.

3.2.2 Method of Data Analysis

In this study, frequency and percentage descriptive statistical methods were used to analyze user demographic characteristics. Structural Equation Modelling was used to examine the significant effects between five gratification variables, Chinese mobile payment user attitudes and their Continuance Use. As a multivariate data analysis technique, SEM is widely adopted by IS research and is useful in studies with limited respondents and skewed data distribution.

4 RESULTS AND DISCUSSION

The purpose of this study is to investigate the factors that influence the attitude and continued usage of mobile payment users in China. Data was collected through an online questionnaire, and 200 respondents were finally obtained after deducting respondents who were incomplete and did not meet the screening requirements. The results were as follows:

4.1 Demographic Profile Summary

The demographic profiles of the participants are showed in Table 1. The collected data shows that all respondents have used mobile payment services, among which WeChat Pay (N=158) and Alipay (N=42) are the main ones. In China, the vast majority of users choose to use WeChat Pay or Alipay, which are operated by Tencent and Alibaba respectively. All users with a smartphone can register and use it on the corresponding platform.

Table 1: Demographic characteristics of respondents

Demographic	Characteristics	No.	(%)
Gender	Male	78	39.0%
	Female	122	61.0%
Age	Below 18 years	2	1.0%
	18-26 years	107	53.5%
	27-35 years	48	24.0%
	More than 36 years	43	21.5%
Most Used Mobile Payment Platform	Wechat Pay	152	79.0%
	Ali Pay	42	21.0%

As can be seen in Table 1, taking into account a total of 194 respondents, the Chinese mobile payment users described by the results are 39.0% male (78 respondents) and 61.0% female (122 respondents). 18-26 years old dominated, accounting for 53.5% (107 respondents), followed by 24.0% (48 respondents) between 27-35 years old, 21.5% (43 respondents) over 36 years old, and 1.0% (2 respondents) below 18 years old.

4.2 Reliability Test

This study conducted a pilot test before the formal launch of the questionnaire. In the pilot test, a questionnaire survey was conducted among 30 mobile payment users to investigate the internal shortcomings, validity and reliability of the questionnaire.

Indicator reliability is described as the degree to which "a variable or set of variables is consistent in what it is intended to measure" [33]. A pilot test was performed to check indicator loadings of each variable. However, not all indicators have significant loads (more than 0.7) on their corresponding latent variables. As a result, they are removed from the model. The results of pilot test showed that HG4 and UG1 made a bad influence about the reliability of variables whose indicator loadings were 0.681 and 0.662. This may mean that these questions are not suitable for Chinese mobile payment users. After delete these questions, the results of the model are shown as Figure 2.

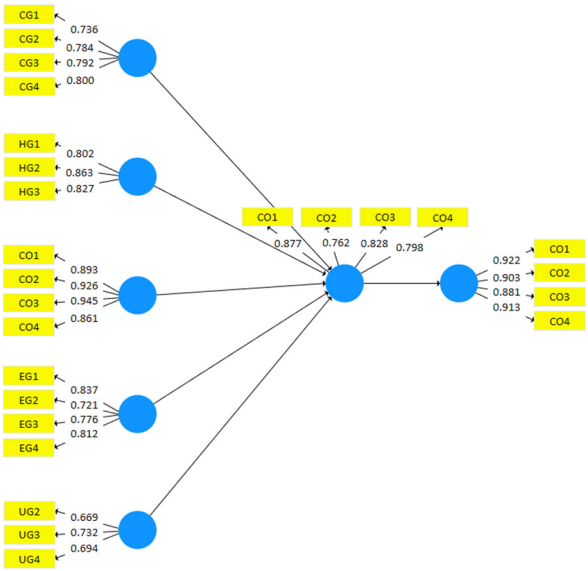

Figure 2: Indicator loading after factor analysis

4.3 Structural Model Assessment

4.3.1 Assessment for Multicollinearity

This study first examined the Multicollinearity. From Table 2, all factors have a VIF value below 5, which indicates that this study has no problem about Multicollinearity.

Table 2: Multicollinearity statistics (inner VIF)

	AT	CU	CG	HG	CO	EG	UG
AT		1.827					
CU							
CG	2.788						
HG	1.308						
CO	3.678						
EG	2.465						
UG	1.908						

4.3.2 Assessment for Path Coefficient

To evaluate the significance of the path coefficient, this study run a bootstrapping algorithm. As 5000 subsamples at 0.1 and 95% confidence interval, the findings are shown in Table 3.

Table 3: Direct relationship for hypotheses testing

Hypothesis	Relationship	Std beta	Std error	|t-value|	Inference	5% CILL	95% CIUL
H1a	CG->AT	0.371	0.067	4.569	Accepted	0.176	0.378
H1b	HG->AT	-0.006	0.09	0.193	Rejected	-0.198	0.103
H1c	CO->AT	0.42	0.079	5.817**	Accepted	0.395	0.798
H1d	EG->AT	0.073	0.078	0.207	Rejected	-0.033	0.188
H1e	UG->AT	0.124	0.042	2.84**	Accepted	0.04	0.23
H2	AT->UG	0.819	0.041	19.389**	Accepted	0.696	0.767

4.3.3 Assessment for Goodness of Fit

To assess the goodness of fit, this study choose the GOF test. In the test, R^2 determination coefficient (R^2) can measures the explanatory power of the model, which makes it a widely used criteria. In IS research, R^2 values of 0.670 and above can be considers as substantial respectively. So the finding in Table 4 shows that the R^2 of the model is substantial.

Table 4: R-squared

Dependent constructs	R^2	R^2 adjusted
AT	.785	.774
CU	.856	.832

4.3.4 Assessment for Structural Effect Size

By analyzing Cohen's f^2, this study assessed the effect size of each path in the model. The f^2 values of 0.350 and above can show a large effect. And f^2 values between 0.150 and 0.350 can show a medium effect. After assessment, the findings are in Table 5.

Table 5: f-square

Constructs	AT	CU
AT		0.835
CU		
CG	0.312	
HG	0.002	
CO	0.498	
EG	0.063	
UG	0.202	

5 CONCLUSIONS

5.1 Conclusion and Discussion

In this study, we investigated the gratification that drives attitudes and continuance use of mobile payment services in China, which is hardly mentioned by extant studies on consumer behavior studies in developing countries however, especially China. This study fills this gap and others indicated by this study by empirically applying U&G theory by collecting raw data on 200 individuals using mobile payment services. The results suggested that cognitive gratification, convenience gratification and usefulness gratification significantly impact users' attitudes towards mobile payments. Furthermore, the findings show that Hedonic gratification and ease of use gratification did not impact user attitudes towards mobile payments. Similar to this study, the results of other studies have also revealed a positive effect of cognitive gratification on users' attitude towards mobile payment [6, 25]. However, there are other study in another developing countries reporting opposite results [1].

The results also suggest that Hedonic gratification can not significantly impact attitudes towards using mobile payments in China. As the results show, enjoyment users receive from mobile payment services may be not enough to change their attitudes. Other studies have also concluded that non-functional benefits have no significant effect in determining mobile payment user gratification [6, 25]. There are also studies that suggest that this hedonic non-functional benefit will trigger the user's intrinsic desire to choose to use or not to use mobile payment services [1]. Different cultures may have created this difference, and in some cultures mobile payments exist only as a convenience. At the same time, users' perceptions of mobile payment services themselves may have deepened this difference, and users could not find non-functional benefits in some functional services.

This study found that convenience gratification significantly affects Chinese users' attitudes towards mobile payment services. This shows that users who use mobile payment services gain convenience from using mobile payment services, which also positively affects individuals' attitudes towards mobile payment services. As demonstrated by the cognitive gratification already supported in this work, mature market environment, mature user habits, and mature product design, at the same time, encourage users to use mobile payment more. Among them, the long-term upgraded product design of Chinese service providers makes it

easy for users to feel the convenience gratification brought by mobile payment. This finding is consistent with studies by Ozturk et al. (2017) and Yonghee et al. (2016), who found that convenience gratification significantly affects user attitudes toward mobile payments. However, differences in culture, literacy levels, legislative and technological infrastructure may be important factors for the replication of the findings compared to studies in other developing countries [1, 22].

The hypothesis that the ease of use gratification of mobile payment services impacts user attitudes is rejected. This finding suggests that, in China, the ease of use of a mobile payment service does not affect whether users use it. Previous research argues that if users have access to information and knowledge about a mobile payment service as previously reported, they tend to find it easy to use [1]. Moreover, Mun et al. (2017) and Chuang et al. (2016) found that ease of use is a key factor affecting users' attitudes towards using mobile payment services. However, in China, perhaps due to the high popularity of research on mobile payment services, users are not confused about how to use it, so a conclusion that is contrary to the previous research has emerged. This also raises the question of whether the key factors affecting users' attitudes towards the mobile payment industry will be different at different stages of the development of the mobile payment industry.

This study showed that there is a positive correlation between usefulness gratification and mobile payment attitudes. Chinese users clearly recognize that mobile payment services can bring them better financial transactions, which has a positive impact on their mobile payment attitudes, leading them to continue using mobile payment services. Moreover, after years of technological development, mobile payment has created a series of trusted software stacks to provide users with full security. Such a trusted environment also helps to enhance users' continuance use by gaining their trust

To practice, the results can guide mobile payment service companies to improve their service capabilities by offering them users' experience. Further, these findings will help to formulate relevant policies or rules for government, telecom and mobile payment companies to improve user gratification and loyalty. Based on the survey results, we recommend that mobile payment service providers enhance these desirable characteristics in the product design process in order to increase user' continuance use.

5.2 Limitation and Future Research

However, this research was carried out on the basis of developing country China, its findings are difficult to generalize it to developed countries. At the same time, the developed mobile payment market in China also brings limitations to this study. Future research can further investigate the key factors impacting users' continuance use of mobile payment services from the perspective of U&G theory by exploring the moderating role of culture and industry development stages.

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