

Analysis on Continuous Usage Intention of Chinese Mobile Games from the Perspective of Experiential Marketing and Network Externality

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Abstract

Mobile games have become one of the most important driving forces of the game industry. We focus on the continuous intention to use Chinese mobile games from the perspective of experiential marketing and network externalities. We integrate user experience, network externalities and flow theory into expectation confirmation model and explore the influencing factors of continuous usage intention of Chinese mobile game and propose a research model. Game experience, service experience, perceived enjoyment, social interaction, challenge, perceived number of users and perceived number of peers were employed as independent variables, while flow, perceived value and satisfaction as mediating variables and continuous intention as the dependent variable. After surveying 426 samples, the model is tested with structural equation model.

The results reveal that perceived enjoyment significantly positively influences perceived value, flow, satisfaction, and continuous intention. The greater the enjoyment of the game, the greater the satisfaction of the game and the greater the willingness to use it continuously. Game experience has a significant direct effect on continuous intention, which indicates that a better game experience can retain more users. Service experience and perceive number of peers positively influence satisfaction.

Another finding is that social interaction and perceived number of users positively influence perceived value and flow, which indicate that social attributes are critical roles for retaining users. Game challenge also positively influences flow. The proper level of challenge is more likely to cause users to enter the state of flow. Flow indirectly influences continuous usage intention through the satisfaction of the game, which indicates that satisfaction is driven by flow experience and further retaining users. Empirical results implied that mobile game companies need to focus on improving user experience, expectation satisfaction and extending network externalities to improve the continuous intention of using mobile game.

Keywords : Mobile Games, Continuous Intention, Expectation Confirmation Model, Value Theory, Network Externality, Experiential Marketing, Structural Equation Model(SEM)

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※ This paper reveals that it quotes some of Bo Lei's research results in his Ph.D. dissertation.

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1. Introduction

According to the analytical reports of the Chinese game industry in 2019, Chinese game market revenue reached 230.88 billion CNY and the growth rate of its revenue was 7.7%. Chinese mobile game was accounted for 68.5% of the whole game market, while Chinese mobile game market revenue reached 158.1 billion CNY, 24.15 billion more than 2018, and the growth rate of its revenue was 18% [GPC and IDC, 2019].

Due to fast characteristics of mobile game, easy to control version, mature industrial division and much lower access threshold than PC games, mobile games represent a major growth in the game industry. Chinese game companies have deployed diversified mobile strategies, including agent and operation of popular mobile games, transplant of existing PC games into mobile games, cross-border integration of entertainment and popular IP, the establishment of mobile E-sports, and game industry ecosystem etc. Several phenomenal games, such as Arena of Valor, Game for Peace, Onmyoji, Clash of Clans, which have long occupied the mobile game list, are all mobile games. Among them, the mobile game "Arena of Valor" independently developed by Tencent Games has more than 50 million active users. Mobile game gradually shows the characteristics of pan-entertainment and popularization.

The Matthew Effect [Rigney, 2010] and the trend of polarization in Chinese game industry are becoming more and more obvious. The market share of Tencent Games and NetEase Game are expanding year by year. In 2019, the revenue of Tencent and NetEase games accounted for 64% of the total mobile game market [IResearch, 2019]. But, many mobile game companies are faced with the

problem of finding new ways to develop further.

Although the market share of mobile game continues to grow, its growth rate is slowing down, and the growth of user scale also shows a weak trend. In 2019, the number of game users had reached 620 million in China, with the growth rate slowing down to 3.2%, which indicated that the scale of mobile game users had reached the bottleneck, the population dividend is gradually disappearing, and the previous incremental market is changing to the stock market [GPC and IDC, 2019].

As mobile game market improves and the competition increasingly fierce, the development of the industry needs more investment in mining stock users and operating the subdivided market. Especially for major mobile game providers, the value of retaining users is becoming ever more precious. Affected by user requirements revision and serious online game homogeneity, the mobile game market growth and sales revenue growth decline rapidly. By the lack of domestic high-quality mobile games, the satisfaction of mobile game players is generally low, and players' willingness to pay and retention is not high, the usage behavior is also more difficult to continue.

So we consider the following research question (RQ) : What factors affect the continuous intention of using mobile games in China?

Through literature reviews, we find that scholars mostly study user behavior of mobile games based on the existing mature models and introduce relevant theories to expand the research. In this study, we integrate expectation confirmation model of information system continuance, value theory and flow theory. We explore the influencing factor of continuous usage intention of mobile games from the perspective of experience marketing and network externalities and propose a re-

search model and some hypotheses. After analyzing 426 samples of the questionnaire survey, we aim to find the critical factor to promote the continuous usage intention of mobile games and to extend the life cycle of mobile games and provide some suggestions for the operation and development of mobile game companies.

This paper proceeds as follows. In Section 2, we review the relevant literature. In Section 3, we present a research model and hypotheses. In Section 4, the model is tested with structural equation modeling, and empirical results are discussed. Lastly in section 5, we provide conclusions based on our results and give some suggestions.

2. Literature Review and theory

2.1 Mobile Games

Mobile games are gaming applications that are played on small handheld computing devices (e.g. smartphones and tablets) that have wireless communication functionality [Merikivi et al., 2017]. Mobile games are where the players make a fictitious character using an online platform. In fact, people mainly play mobile games on smartphones in daily life. Mobile games are differentiated from other platform games such as console, PC and arcade games in terms of their portability, accessibility, networkability and simplicity [Jeong and Kim, 2009].

With the touch screen, positioning system, high visual and sound qualities affect and other functions developed by the smartphone, this series of breakthroughs has brought the new experience of mobile games to the players. According to the latest survey data of [PC and IDC, 2019], the rapid development of domestic mobile game market is mainly

driven by the development and update of smartphones. The share of mobile games had reached 79%. The proportional distribution of Chinese mobile game market segmentation has tended to be stable, and role-playing games have performed well in the overall market revenue and independent R&D market. In mobile game products, role-playing games have become the favorite of players due to their high generation and pilot experience. The number of role-playing games accounted for 54%; the next was strategy game, accounting for 14%; The card game, leisure, simulation, shooting and chess were gradually squeezed, accounting for no more than 10%. From the perspective of revenue distribution, role-playing games still occupied an absolute advantage, accounting for 45.5%; MOBA (Multiplayer Online Battle Arena) games were developing rapidly, accounting for 14.9%; Strategy games were second only to MOBA, accounting for 13.6%; the three accounts for more than 70% of the total revenue; Shooting games accounted for 8.6%, racing games accounted for 6.8%; leisure, card games and other games accounted for less than 5% [GPC and IDC, 2019].

The proportion of head mobile games accounts for more than half of the playing time among the mobile game users. In China, two of the biggest game companies are Tencent Game and NetEase Game. Tencent game occupies more than half of the playing time of mobile game users because it has some head mobile games such as Arena of Valor, Game for Peace and Joy Doudizhu. The mobile game contributes nearly 60% to Netease Game's revenue. Immortal Conquest, LifeAfter, Tom and Jerry, and Onmyoji are head mobile game of NetEase Game [AuroraMobile, 2020].

The mobile game is a complex network service system, and it is inevitably affected by

numerous factors. Some scholars focus on the determinants of intention to play the game. Technology acceptance model (TAM) is usually adopted as the foundation model to study why people play mobile game [Davis, 1989], which consider perceived ease of use and usefulness as the determinant. Built on use & gratification and flow theory, Chen et al. [2018] researched the stickiness of location based service game : Pokémon Go through intrinsic motivation, network externalities, and serendipity. Merikivi et al. [2017] showed that continuous mobile game use was strongly driven by enjoyment, which in turn is primarily driven by the system's capacity of regeneration and visually attractive and easy-to-use interface. Hsiao and Tang [2016] explored a post-acceptance (continuous intention) model of mobile movie-themed game from the perspective of experiential marketing. Hsiao and Chen [2016] built a research model based on the value theory to identify the antecedents of loyalty and in-app purchase intention in the context of mobile games. Su et al. [2016] explored the different factors that affected the player loyalty of mobile game users through flow theory. Jung and Kim [2016] researched the relationship between user satisfaction and the motivation to play mobile games. Zhou [2013] identified the factors affecting user adoption of mobile games based on flow theory. From the above, there are few studies that focus on the continuous intention to use mobile game, especially from the perspectives of experiential marketing and network externalities.

2.2 Expectation Confirmation Model

Expectation Confirmation Theory (ECT) is from the field of marketing. It is mainly used to study consumers' expectation of user satis-

faction before purchase and the comparison of user satisfaction after purchase. Bhattacharjee [2001] is the first one to apply ECT in the research field of information systems, who continue to use it. He considered that the users continuance usage intention is influenced by perceived usefulness and customer satisfaction and customer satisfaction, perceived usefulness and expected to confirm the degree of influence, perceived usefulness is expected to confirm the degree of influence, and based on the above theory assumed that expectation confirmation model (ECM) of information system continuance [Bhattacharjee, 2001].

ECM has been applied to different contexts to explain factors affecting continuous usage intention of information system, such as mobile image-based apps [Chen and Fu, 2018], digital textbook [Joo et al., 2017; Hu and Zhang, 2016], social network games [Piguing and Ko, 2016], online games [Liao et al., 2016]. Mobile games can be regarded as a hedonic information system, and social network function is an important aspect of the mobile game. Therefore, we consider ECM-ISC as the basic framework of the theoretical model.

2.3 Value Theory

Perceived value is the consumers' overall assessment of the utility of a product based on perceptions of what is received and what is given [Lai, 2004]. In general, value was divided into utilitarian value and hedonic values [Pöyry et al., 2013]. Some scholars considered functional needs and nonfunctional needs (including social, emotional, and epistemic values) as motivation to obtain products or services in the context of information technology [Turel et al., 2010].

Chen and Fu [2018] integrated value theory

to expectation confirmation model. They propose three kinds of mobile value (Including hedonic, utilitarian, and sociability), which instead of perceived usefulness, to measure users' perceptions of image-based apps and explores how the three kinds of value impact user satisfaction and long-term behavioral intentions. Chang integrated interaction and value as the antecedents of user satisfaction and flow experience, and further affects the continuance intention of social network sites game. Yang et al. [2009] indicated that both utilitarian value and hedonic value are the key ways for enhancing the satisfaction of online game.

The perceived value of mobile game users can be split into utilitarian value and hedonic value. Utilitarian value refers to the degree to which users' relationship maintenance and development, information content release and acquisition, and other instrumental needs are satisfied by mobile games: Hedonic value refers to the degree to which users' emotional needs such as leisure and entertainment, mood relaxation and internal pleasure are satisfied by mobile games. We consider that utilitarian value and hedonic value obtained by using social online game are represented by social interaction and perceived enjoyment.

2.4 Experiential Marketing

Because the products and services of mobile game largely extent through the user's personal experience and direct relationship, therefore, marketing strategies can be improved from the perspective of user experience. Schmitt [1999] pointed out that the experience can be combined with products and services and become the core competitive advantage of business marketing. Schmitt

[1999] proposed five types of customer experience : sense, feel, think, act, and relate. Hsiao and Tang [2016] explored a post-acceptance model from the perspective of experiential marketing with five elements : Thematic attractiveness, perceived enjoyment, flow, act, and relate in the context of mobile movie-themed game. Huang and Hsieh [2011] identified experiential motives from three factors : sense of control, perceived entertainment, and challenge. Koo [2009] found that three experiential motives : enjoyment, escape, and social affiliation had a positive impact on the intention to play online games.

From the above, we can find that the user experience is a multi-field and complicated concept. But it's not difficult to find out what they have in common : Customer experience is the internal psychological feeling of consumers, which often come from the interaction between consumers and enterprises. We define user experience of mobile game -a comprehensive internet information system- as a series of psychological reactions, such as subjective cognition, feeling, and evaluation. They are formed in the process of communication and interaction between the user and the mobile game product and its service provider, such as downloading games, experiencing games, purchasing props and receiving services in the consumption situation provided by the game service provider. This paper mainly refers the classifications of user experience from Schmitt [1999] and Hsiao and Tang [2016], and combines with the opinions of many senior players of mobile games. We divide the user experience of mobile games into five dimensions : Game experience, service experience, perceived enjoyment, social interaction, and challenge. We summaries various classifications of consumer experience in <Table 1>.

〈Table 1〉 Studies on Experiential Marketing

Context	Key constructs	Authors
Mobile movie themed games	Thematic attractiveness, perceived enjoyment, flow, act, and relate.	Hsiao and Tang [2016]
Online game	Sense of control, perceived entertainment, and challenge.	Huang and Hsieh [2011]
Online game	Concentration, enjoyment, escape, epistemic curiosity, and social affiliation.	Koo [2009]
Experiential marketing	Sense, Feel, Think, Act, and Relate	Schmitt [1999]

2.5 Network Externalities

Network externalities describe how a person's use of a particular product or service changes according to the perceived number of other users of that product or service: the person's use increases if more other people are also using it [Wei and Lu, 2014]. Network externality will enhance the perceived utility of individuals, not only the economic value but also affect users' cognition and attitude towards commodities. Network externalities occur when the value of a network increases as the number of users of the network increases. The externality occurs because each user increases the value of the network not only for her but also for other users of the network [Song and Walden, 2007]. People are more likely to use a particular technology when they perceive that it is popular among others and especially when various people in their social group use it [Wei and Lu, 2014].

Chen et al. [2018] conceptualized network externalities into weak-tie influence (game's popularity) and strong-tie influence (peer and social influence). Lee et al. [2018] examined network externalities (including perceived number of users, and perceived number of friends) are factors that positively influence

the intention to use of mobile social network games. Wei and Lu [2014] considered network externalities of two dimensions : perceived number of peers and perceived number of users to examine what factors influence the intention to play mobile social game. Network externalities significantly affected perceived usefulness and satisfaction, further determining user loyalty [Zhou and Lu, 2011]. Total network size and the number of active members on the "buddy list" are significant network externality factors Chun and Hahn [2007]. From the above, we consider that network externalities are important influencing factors of continuous usage intention of mobile games. We summarize the previous studies on network externalities in 〈Table 2〉.

〈Table 2〉 Studies on Network Externalities

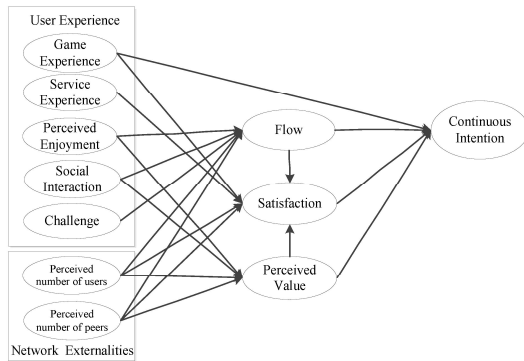
Context	Key constructs	Authors
Mobile game	Game's popularity and peer and social influence	Chen et al. [2018]
Mobile social network games	Perceived number of friends and perceived number of users	Lee et al. [2018]
Mobile social games	Perceived number of peers and perceived number of users	Wei and Lu[2014]
Mobile instant messaging	Network size and perceived complementarity.	Zhou and Lu[2011]
Network services	Total network size, total network size and network strength	Chun and Hahn [2007]
Peer-to-peer networks	Perceived size of network and perceived network externalities	Song and Walden [2007]

3. Research Model and Hypotheses

3.1 Research Model

We consider that mobile game providers can establish relationships with users from two dimensions : user experience, network externalities, and enhance continuous usage

intention through perceived value, satisfaction and flow experience. Based on information system continuance expectation confirmation model, we integrate user experience, network externalities and flow theory into expectation confirmation model. We propose a research model of continuous intention to use mobile game from the perspective of experiential marketing and network externalities. As shown in <Figure 1>.



<Figure 1> Research Model

3.2 Hypotheses Development

3.2.1 User experience

We consider user experience of five dimensions : Game experience, service experience, perceived enjoyment, social interaction and challenge.

Game experience reflects the distinct features of mobile game. Its concept resembles Schmitt's [1999] sense element. Yuan and Wu [2008] indicated that sense experience is a message that customers formed towards products or services by their sense. In this study, game experience refers to the feeling for product quality and system quality of mobile games. Product quality includes front-end interface interaction design, audio-visual quality, etc.; system quality includes media

mobility, operability, game skills, data transmission quality, etc. When players play a role in the games, along with the theme design, animation and sounds, the rich sensory environment can make the experience unforgettable [Hsiao and Tang, 2016].

Visual, acoustic, and aesthetic attractiveness of a gaming experience will enhance gamers' stickiness to the game, promote further playing [Hsiao and Tang, 2016]. Jung and Kim [2016] examined that system quality had a positive impact on user satisfaction. Delone and Mclean [2003] indicated that information quality and system quality positively affect satisfaction in the context of information system usage. Previous studies have highlighted the importance of visual and auditory attractiveness in online game, which can provide impressive and fun in game activities.

Game experience of mobile game, which differ from other studies of PC game, means that users are directly satisfied with the environment of mobility, and want to continue using the game. It was also empirically demonstrated that the higher the game experience in mobile game, the more significant the intention to use mobile game continuously. Mobile game companies and developers should focus on providing empirical elements of mobile games and provide continuous consumption services for users. Thus, we propose the following hypotheses :

- H1 : Game experience positively influences satisfaction.
- H2 : Game experience positively influences continuous intention to use mobile game.

Service experience reflected the operational level of game providers, which is part of Service Quality similar to Schmitt's [1999] sense element. Parasuraman et al. [1985]

defined service experience as a global judgment, or attitude, relating to the superiority of the service, and superiority is the gap which practical service higher than consumer expectation. In this study, Service experience refers to the feeling about customer service quality and version iteration of mobile games. Service quality includes the speed and quality of handling user problems; version iteration mainly refers to the game update of content, operation etc.

Wang et al. [2019] indicated that service quality positively affects user satisfaction with regard to mobile communication apps. Wang and Chen [2016] indicated service quality is a key determinant of customer satisfaction and continuance intention of mobile apps. Zhao et al. [2012] showed that three dimensions of service quality have a significant and positive effect on satisfaction in the context of mobile value-added services. When using mobile game, if user encounters problems, they expect the customer service to respond in time and solve the problems quickly. The better the service experience of using mobile game, the more satisfaction the gamer feels. Therefore, we propose the following hypothesis :

H3 : Service experience positively influences satisfaction.

Perceived enjoyment is adopted more often in game research. The concept of perceived enjoyment holds most of the essence of feel experience. The purpose of both concepts is to stimulate customers' internal pleasure and emotion towards a specific product or service. Immersed in the game experience, users can experience emotional pleasure and satisfaction in the process of the game. Past researches have shown that perceived enjoyment regards as a type of hedonic value. In

this study, perceived enjoyment refers to the pleasure and enjoyment that users feel in the process of using mobile games.

Chang [2013] examined that hedonic value (Perceived enjoyment) positively affects flow experience in the context of social network game. He also revealed that perceived enjoyment positively affects flow experience in the context of mobile games. Kim et al. [2007] found that enjoyment positively affects perceived value in the context of mobile internet. When mobile games can bring users a higher degree of enjoyment, users will more easily feel the value of mobile games, more easily and perceive more enjoyment, leading to higher satisfaction. Accordingly, we propose the following hypotheses:

H4 : Perceived enjoyment positively influences flow.

H5 : Perceived enjoyment positively influences perceived value.

Social interaction refers to an interpersonal action or a relationship between an individual and others [Wang and Chen, 2012]. Social interaction reflects the interaction of mobile game, and focuses on the social attribute of mobile games. Its goal is to show users some other ways to do things, different lifestyles, and new interactions [Hsiao and Tang, 2016]. Through social interaction, players can communicate with others, exchange experiences, improve game skills and develop a relationship with other players and games. In this study, social interaction is defined as the interaction between two or more users communicating and affecting each other in mobile game.

Previous studies reported that if the platform of online games is considered a social place, then it assists players to make social relationships [Huang and Hsieh, 2011]. Alzah-

rani et al. [2017] examined that social interaction significantly affects flow experience of online game. Zhang et al. [2017] examined that social interaction significantly influences perceived values in the context of WeChat. Su et al. [2016] which explored that social interaction positively influenced flow experience in mobile games. Chen et al. [2016] found social interaction significantly influences the hedonic value of social network games. Liu [2016] revealed that social interaction significantly affects flow experience of online games. Players develop social relationships with their virtual identity in the game world [Liu and Chang, 2016]. Online social networking technologies changed the trend of digital games to social network-based online games [Park et al., 2014]. They also revealed that social interaction is positively related to the flow experience toward continuously using social network games. Thus, we propose the following hypotheses :

- H6 : Social interaction positively influences flow.
- H7 : Social interaction positively influences perceived value.

Challenge was described as “a sense that one’s capabilities are being stretched” [Bridges and Florsheim, 2008]. Challenge reference to Schmitt’s [1999] think elements, which focus on the intelligence of consumer, and provide cognitive and problem-solving experience, and creatively attract customers. An appropriate level of challenge can keep players in the game and retain their state of flow [Hoffman and Novak, 2009]. In the context of digital game, challenge referred to the attributes that create positive challenges similar to those faced in playing sports [Merikivi et al., 2017]. In this study, Challenge refers to the

extent of difficulty degree of mobile game.

Positive challenges differ from negative challenges, which are associated with problems, such as difficulties in the navigation or slow download time [Koufaris, 2002]. The positive challenge is frequently recognized as among the most important predictors of flow and users’ enjoyment in various information technology settings, particularly in hedonic environments [Merikivi et al., 2017]. Huang et al. [2017] indicated that challenge positively affects flow of online games. They also examined that challenge was a significant factor of continuance intention through perceived enjoyment in the context of mobile games. Su et al. [2016] explored that challenge positively influenced flow experience and further influence the player loyalty of mobile game. Liu and Shiue [2014] found that challenge had a positive influence on flow experience in Facebook game. Hoffman and Novak [2009] suggested that challenge can retain flow state in mobile game. Mobile game usually poses a series of challenges to overcome or achieve the goals that users need to accomplish before the next level of the game. The users may lose interest in the game if the challenge is seen as too simple. However, if it is too difficult, users might become frustrated and anxious. Therefore, the positive subjective challenge is the key to maintain user interest and participation. We propose the following hypothesis :

- H8 : Challenge positively influences flow.

3.2.2 Network Externalities

Network externalities are important motivation factors of mobile games. The more players play the game, the more connection form between players. When users perceive that more friends and others play the same mobile

game, they can interact more readily with friends or strangers at any time and fulfill their entertainment needs, which in turn further improve users' continuous intention [Wei and Lu, 2014]. In other words, people use the product or service more when there are others who are doing the same and when more people use it in their social group [Kraut et al., 1998]. For instance, when the number of www.Taobao.com users reaches a critical mass, the platform generates more benefits. It also attracts more commodity retailers to provide more cost performance products, which in turn bring more customers.

This study focuses on mobile game, in which the number of players is the key to a successful game. We conceptualize network externalities into perceived number of users and perceived number of peers. Perceived number of users is due to game popularity and perceived number of peers is originated from friends and social influence in real life. In this study, we define perceived number of users as users' perception of the number or scale of users reached by mobile games and perceived number of peers refers to the number of friends or family members playing mobile games.

Chen et al. [2018] examined that network externalities have a positive influence on Use & gratification and further affect stickiness but no obvious effects on flow. Zhang et al. [2017] confirmed that direct network externalities (including network size and number of peers) had a positively effect on perceived values and then influenced continuance intention of WeChat. Zhou [2015] suggested that referent network size, which reflects direct externality, was positively related to perceived usefulness and flow. He also found that network externalities influence the intention to play mobile social game. Chiu et al. [2013] found that perceived network size had a posi-

tive effect on a member's identification (emotional and value), which in turn had positive effects on the loyalty of social network sites. Zhao and Lu [2012] indicated that perceived network size had a significant effect on perceived interactivity and further positively affected users' satisfaction and continuance intention of Micro-blogging service. Mäntymäki and Salo [2011] revealed that perceived network externalities exert a significant effect on usefulness but do not have a direct effect on the continuous usage of social virtual worlds. Zhou and Lu [2011] examined that network externalities significantly affected perceived usefulness and satisfaction, further affected user loyalty to mobile instant messaging. They also examined that both perceived number of members and perceived number of peers had a positive effect on continued intention to use social network service through perceived benefit. Lin and Bhattacharjee [2008] found that network externalities positively influenced perceived value. Given the influences of the number of peers on social value, users are more likely to link their offline social network and create an alternative way to contact, rather than to make new friends [Boyd and Ellison, 2007]. Therefore, we propose the following hypotheses:

- H9-1 : Perceived number of users positively influences flow.
- H9-2 : Perceived number of users positively influences perceived value.
- H9-3 : Perceived number of users positively influences satisfaction.
- H10-1 : Perceived number of peers positively influences flow.
- H10-2 : Perceived number of peers positively influences perceived value.
- H10-3 : Perceived number of peers positively influences satisfaction.

3.2.3 Flow

The flow was defined by Csikszentmihalyi (1989) as a special holistic experience when people fully engaged in certain activities. When individuals are in the flow state, they are completely focused on their activity and was unable to recognize changes in their surroundings. Specifically, they lost their self-consciousness, concentrating only on their on-going activity. They also conceptualized online flow as a cognitive experiencing state. To evoke a flow experience, the design will recognize that it depends on how users perceive the levels of skill, challenge, attention, and interaction (Hsiao and Tang, 2016). Flow has been applied in various games contexts such as mobile games (Chen et al., 2018; Hsiao and Tang, 2016; Su et al., 2016; Zhou, 2013), online game (Liao et al., 2019; Huang et al., 2017), social network game (Chang, 2013). When using mobile game, players need to be highly concentrated and often fall into the flow experience state. In this study, we define flow as a holistic experience that users feel fully participate in mobile game.

Many studies have suggested that flow experience has an impact on user satisfaction and continuous use intention in various contexts. Liao et al. (2019) verified that flow positively influences online game loyalty. They also indicated that flow had a positively effect on online game loyalty. Wang et al. (2015) shown that flow experience had significant correlations with college students' continuance intention of leisure internet usage. Kim and Jang (2014) conducted user flow had a significantly positive effect on user satisfaction and continuance intention of social network game. Hsu et al. (2014) found that flow positively influenced satisfaction and continuance intention of social network websites.

Chang (2013) examined flow experience has a positive effect on continuance intention to use social network game. Chang and Zhu (2012) found that flow experience had an influence on users' satisfaction but not on continuance intention of social networking sites. Zhou and Lu (2011) showed that flow experience significantly influence satisfaction, further affecting user loyalty to mobile instant messaging. Choi and Kim (2004) found that user's flow state had a tendency to impact consumer loyalty. Accordingly, we propose the following hypotheses :

H11 : Flow positively influences satisfaction.

H12 : Flow positively influences continuous intention to use mobile game.

3.2.4 Perceived Value and Satisfaction

Because the products and users of mobile games have strong flexibility and interactivity, users generally use them out of personal willingness during their spare time and leisure time. The value of mobile games is more about having hedonic experience, killing time, expanding social circle, enhancing social identity, and providing channels for emotional expression, which are not only "perceived usefulness" but also generalized and driven. It is difficult to explain the user behavior of this kind of product with expectation confirmation model. Therefore, we introduce value theory to replace perceived usefulness with perceived value and express perceived value of two aspects of hedonic value (perceived enjoyment) and social value (social interaction). In this study, perceived value refers to the judgment or comparison between the benefit and costs of using mobile game. The benefit includes hedonic value and utilitarian value, and the costs include the money,

time and energy spent.

Chen and Fu [2018] indicated that perceived value (hedonic, utilitarian and sociability) positively affected user satisfaction and behavioral intention of image-based social apps. Zhang et al. [2017] confirmed that social value and hedonic value positively influenced continuance intention of WeChat usage. Hsiao et al. [2016] indicated perceived value positively influenced satisfaction and continuance intention of mobile social apps. Hsiao and Chen [2016] revealed that perceived values had a direct influence on the loyalty of mobile games. Hong found that hedonic and epistemic values could predict an individual's continuance intention to play educational games. Chang [2013] suggested that perceived hedonic value and utilitarian value had a positive effect on satisfaction toward continuously using social network game. Yang et al. [2009] indicated that both utilitarian value and hedonic value were the key ways for enhancing the satisfaction of online game. Lai [2004] found that perceived value is positively correlated to customer satisfaction.

Satisfaction as users' effect on (feelings about) prior information system use [Bhattacharjee, 2001]. According to marketing, customer satisfaction is a type of psychological state, that is, customers' attitude towards products and services. Generally, after customers purchase a product or service, they will perceive its price and quality, and judge whether the expectation is confirmed. If the demand is met, customer satisfaction will be achieved. For mobile game, the continuous usage intention is similar to customer loyalty in the marketing field. If users are very satisfied with a mobile game, it is likely to prompt users to play again to form loyalty. In this study, satisfaction refers to an overall evaluation of the game after playing mobile games.

Sun et al. [2017] found that satisfaction is a major factor of continued use intention of social media. Joo et al. [2017] found that satisfaction had a direct and positive influence on continuance intention to use digital textbooks. Piguig and Ko [2016] examined that satisfaction positively influenced the continuance intention in social network game. Hu and Zhang [2016] suggested that satisfaction directly influenced continuance intention of mobile book-reading app. Kim and Jang [2014] found that satisfaction had significantly a positive effect on continuance intention in social network game. Bhattacharjee [2011] indicated user's satisfaction positively influenced on continuance intention of online banking. Accordingly, we propose the following hypotheses :

H13 : Perceived value positively influences satisfaction.

H14 : Perceived value positively influences continuous intention to use mobile game.

H15 : Satisfaction positively influences continuous intention to use mobile game.

4. Empirical Results

4.1 Data collection and Sample

We collected data through a questionnaire survey. The survey object is the users who have used mobile games and are relatively familiar with mobile games. We sent out questionnaires online through the Sojump website. In total, there were 526 respondents to the survey and in 426 valid samples (rate is 80.9%) through the validation of the collected samples.

The online questionnaire consisted of three parts. First, we presented the research pur-

pose statement and measurement items. Second, individual demographic information was described in four aspects : gender, age, education, and monthly income. As shown in (Table 3). The last part included usage statistics from five dimensions, such as Game platform, Number of games played, Mobile games spent time, Frequency of playing, Game type of most playing. Overall, male and female respondents account for 53.6% and 46.4% respectively. 48.6% of respondents are less than 24 years old.

(Table 3) Demographics Characteristics of Sample

	Category	Frequency	Percentage
Gender	Male	230	54.0%
	Female	196	46.0%
Age	< 18	39	9.2%
	18~24	168	39.4%
	25~34	110	25.8%
	35~44	86	20.2%
	> 45	23	5.4%
Education	High school	60	14.1%
	Junior College or University:	251	58.9%
	Master or above.	115	27.0%
Monthly Income (CNY)	< 5000:	218	51.2%
	5001~10000:	161	37.8%
	10001~15000:	25	5.9%
	> 15000.	22	5.1%

4.2 Measurement

Following the previous literature, we adopted measurement items from validated instruments : seven independent variables (User experience : game experience, service experience, perceived enjoyment, social interaction and flow experience; Network externalities : perceived number of users and perceived number of peers); three intermediate variables (perceived value, flow, and satisfaction); and one dependent variable (continuous intention). First, four items of game experience are referred from Merikivi et al.

(2017) and Delone and Mclean (2003). Four items of service experience modified from Cristobal et al. (2007) and Wang and Chen (2016). Four items of perceived enjoyment modified from (Merikivi et al., 2017) and (Hsiao a Tang, 2016). Four items of social interaction modified from (Chang, 2013). Four items for challenge modified from Merikivi et al. (2017) and Koufaris, (2002). Measurement items on network externalities (perceived number of users and perceived number of peers) were modified from Wei and Lu (2014) and Chen et al. (2018). The three items of flow were modified from Csikszentmihalyi (1989) and Chen et al. (2018). Moreover, the four items of perceived value were modified from Kim et al. (2007) and Wang et al. (2013), and five items of satisfaction were modified from Bhattacharjee (2001) and Chang (2013). Last, four items of continuous intention were referred from Bhattacharjee (2001) and Merikivi et al. (2017). All survey questions were measured on a five-point Likert-type scale, from 'strongly disagree', 'disagree', 'normal', 'agree', 'strongly agree' and the scores were 1 to 5. (Detailed items of each measurement variables are given in Appendix.)

4.3 Measurement Assessment

After building SEM, we imported sample data for calculation, and the results showed that the model can be successfully identified and estimated. The following are results of the model fit test : $\chi^2 = 1678.416$ (df = 703, P = 0.000), CMIN/df = 2.388, GFI = 0.831, AGFI = 0.803, CFI = 0.927, TLI = 0.918, IFI = 0.927, NFI = 0.881, RMR = 0.044, RMSEA = 0.057. Generally, GFI, AGFI, CFI, TLI, IFI and NFI are above 0.8~0.9, RMR and RMSEA are below 0.05, which closer to 0, the better the result. The results showed that the pre-

set model and hypotheses are basically reasonable.

The reliability test is an important method to ensure the quality of the questionnaire. In this paper, SPSS22.0 was used to test the reliability of the questionnaire. As shown in <Table 4>, the Cronbach's α coefficient of variables are among .779 and .919, greater than 0.7, which indicate that the reliability of the scale was good.

Convergent validity is used to test the correlation between internal measurement items of variables. In SEM, the important indexes to evaluate the convergent validity of variables were composite reliability (CR) and average variance extracted (AVE). The results of the confirmation factor analysis were shown in <Table 4>, every factor loading (from the results of AMOS22.0) of measurement items is greater than 0.6, which meets the standard of convergent validity. CR values are among .786 and .919, AVE values are among .554 and .746. Each Composite Reliability values are greater than 0.7, and each AVE values are greater than 0.5. It is shown that the validity of the questionnaire is high.

Generally, if the correlation coefficient of variables is less than the square root of the AVE value, we can say that discriminant validity is achieved. In this study, the correlation coefficient of independent variables are shown in <Table 5>, and are less than the square root of AVE value, which can be said that discriminant validity is achieved.

We also checked multicollinearity among independent variables. The variance inflation factors (VIFs) of all independent variables were acceptable and between 1.645 and 2.465. This indicated that all of the independent variables were distinct, and multicollinearity was not a problem. Overall, the assess-

<Table 4> Reliability and Results of Confirmation Factor Analysis

Variables	Items	Factor loading	CR	AVE	Cronbach's α
GEE	GEE1	.819	.907	.711	.905
	GEE2	.810			
	GEE3	.864			
	GEE4	.877			
SEE	SEE1	.795	.903	.699	.900
	SEE2	.878			
	SEE3	.836			
	SEE4	.833			
PE	PE1	.847	.919	.739	.919
	PE2	.866			
	PE3	.871			
	PE4	.855			
SI	SI1	.915	.903	.702	.902
	SI2	.869			
	SI3	.803			
	SI4	.754			
CHA	CHA1	.693	.832	.560	.822
	CHA2	.897			
	CHA3	.801			
	CHA4	.559			
PNOU	PNOU1	.857	.898	.746	.896
	PNOU2	.893			
	PNOU3	.841			
PNOP	PNOP1	.807	.840	.638	.837
	PNOP2	.726			
	PNOP3	.848			
FW	FW1	.782	.786	.554	.779
	FW2	.816			
	FW3	.62			
PV	PV1	.862	.814	.596	.806
	PV2	.781			
	PV3	.66			
SAT	SAT1	.771	.889	.669	.887
	SAT2	.760			
	SAT3	.865			
	SAT4	.869			
CI	CI1	.808	.913	.727	.908
	CI2	.678			
	CI3	.953			
	CI4	.941			

Note : GEE(Game experience), SEE(Service experience), PE(Perceived enjoyment), SI(Social interaction), CHA(challenge), PNOU(perceived number of users), PNOP(Perceived number of peers, FW(Flow), PV(Perceived value), SAT(Satisfaction), CI(continuous intention).

ment indicated that our instrument had appropriate convergent and discriminant validity for the data sets.

〈Table 5〉 The Correlation Coefficient and Discriminant Validity

Variables	1	2	3	4	5	6	7
1. GEE	.711(.843)						
2. SEE	.612**	.699(.836)					
3. PE	.662**	.621**	.739(.860)				
4. SI	.457**	.460**	.561**	.702(.838)			
5. CHA	.665**	.546**	.641**	.582**	.560(.748)		
6. PNOU	.753**	.567**	.626**	.413**	.580**	.746(.864)	
7. PNOP	.593**	.593**	.693**	.582**	.685**	.549**	.638(.799)
Composite Reliability	.907	.903	.919	.903	.832	.898	.840

Note) () the square root of AVE.

〈Table 6〉 Results of Hypotheses Test

Hypothesis	Standardized Coefficients	S.E.	C.R.	p-value	Supported or Not supported
H1 : GEE → SAT	.116	.054	1.731	.084	Not Supported
H2 : GEE → CI	.308	.074	4.952	***	Supported
H3 : SEE → SAT	.161	.048	3.334	.002	Supported
H4 : PE → FW	.515	.065	7.335	***	Supported
H5 : PE → PV	.818	.066	13.269	***	Supported
H6 : SI → FW	.187	.040	3.508	***	Supported
H7 : SI → PV	.076	.036	1.803	.071	Not Supported
H8 : CHA → FW	.137	.071	2.040	.041	Supported
H9-1 : PNOU → FW	.118	.045	2.121	.034	Supported
H9-2 : PNOU → PV	.089	.041	2.008	.045	Supported
H9-3 : PNOU → SAT	-.012	.048	-.190	.849	Not supported
H10-1 : PNOP → FW	.010	.059	.137	.891	Not supported
H10-2 : PNOP → PV	.002	.052	.036	.971	Not supported
H10-3 :PNOP → SAT	.151	.046	2.485	.013	Supported
H11 : FW → SAT	.244	.067	3.334	***	Supported
H12 : FW → CI	-.094	.113	-1.124	.261	Not supported
H13 : PV → SAT	.292	.059	3.901	***	Supported
H14 : PV → CI	.257	.100	2.996	.003	Supported
H15 : SAT → CI	.254	.113	3.325	***	Supported

*p < 0.05; **p < 0.01; ***p < 0.001.

4.5 Hypotheses Test Results

Hypotheses test is carried out on the research model to analyze the impact intensity and significance of each path for the influencing factors of the continuous intention of using the mobile game. The results are shown in 〈Table 6〉.

H1 is not supported. The standardized coefficient between game experience and satisfaction is .116, significant level $p = .081$, which indicates that game experience has no positive effect on satisfaction.

H2 is supported. The standardized coefficient between game experience and continuous intention is .308, significant level $p < .001$.

which indicates that game experience significantly has a positive effect on continuous intention of using mobile games. This shows that a better game experience can enhance users' satisfaction and directly retain users.

H3 is supported. The standardized coefficient between service experience and satisfaction is .161, significant level $p < .01$, which indicates that service experience has a positive effect on satisfaction, and it shows that the better service experience provided by game operators, the higher user satisfaction.

H4 is supported. The standardized coefficient between perceived enjoyment and flow is .515, significant level $p < .001$, which indicates that perceived enjoyment has a positive effect on flow.

H5 is supported. The standardized coefficient between perceived enjoyment and perceived value is .818, significant level $p < .001$, which indicates that perceived enjoyment has a positive effect on perceived value. This shows that the more perceived enjoyment of mobile games, the more perceived benefit. It reflects that mobile games are an entertainment-oriented information system.

H6 is supported. The standardized coefficient between social interaction and flow is .187, significant level $p < .001$, which indicates that social interaction has a positive effect on flow.

H7 is not supported. The standardized coefficient between social interaction and perceived value is .076, significant level $p = .071$, which indicates that social interaction has no positive effect on perceived value.

H8 is supported. The standardized coefficient between challenge and flow is .137, significant level $p < .05$, which indicates that the challenge has a positive effect on flow.

H9-1 is supported. The standardized coefficient between perceived number of users and

flow is .118, significant level $p < .05$, which indicates that perceived number of users has a positive effect on flow, and the more users of the game, the more benefit they get from mobile games, and further affect continuous usage intention. H9-2 is supported. The standardized coefficient between perceived number of users and perceived value is .089, significant level $p < .05$, which indicates that perceived number of users has a positive effect on perceived value, and the more users of the game, the more benefit they get from mobile games, and further affect continuous usage intention. H9-3 is not supported. The standardized coefficient between perceived number of users and satisfaction is $-.012$, significant level $p = .849$, which indicates that perceived number of users has no positive effect on satisfaction.

H10-1 is not supported. The standardized coefficient between perceived number of peers and flow is .010, significant level $p = .891$, which indicates that perceived number of has no positive effect on flow. H10-2 is not supported. The standardized coefficient between perceived number of peers and perceived value is .002, significant level $p = .971$, which indicates that perceived number of has no positive effect on perceived value. H10-3 is supported. The standardized coefficient between perceived number of peers and satisfaction is .151, significant level $p < .05$, which indicates that perceived number of peers will positively affect satisfaction. It shows that the more peers play the same game, user get more satisfaction from the game, and further affects continuous intention

H11 is supported. The standardized coefficient between flow and satisfaction is 0.244, significant level $p < 0.001$, which indicates that flow has a positive effect on satisfaction. In this paper, flow refers to a holistic expe-

rience that users feel fully participate in mobile games, the stronger the flow experience brought by mobile games, the higher satisfaction.

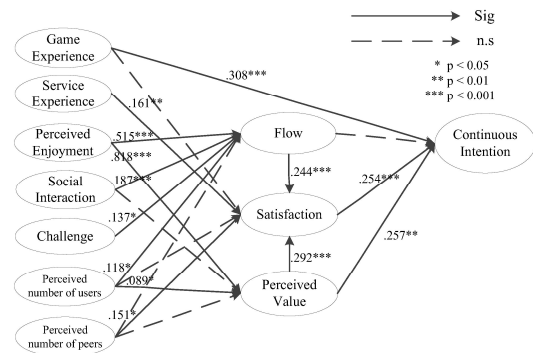
H12 is not supported. The standardized coefficient between flow and continuous intention is $-.094$, significant level $p = .261$, it indicates that flow experience has no positive effect on continuous intention. It is similar with the result of Chen et al. [2018], which revealed that flow had no positive effect on stickiness of location based service mobile game. But it's not consistent with the result of Hsiao and Tang [2016], which found flow significantly affected loyalty in the context of mobile movie-themed game.

H13 is supported. The standardized coefficient between perceived value and satisfaction is $.292$, significant level $p < .001$, which indicates that perceived value significantly has a positive effect on satisfaction. The larger the gap between the perceived benefit and the cost of using mobile games, the higher the user satisfaction.

H14 is supported. The standardized coefficient between perceived value and continuous intention is $.257$, significant level $p < .01$, which indicates that perceived value has a positive effect on continuous intention. It shows that perceived benefit can not only indirectly affect continuous intention through user satisfaction, but also directly affect continuous intention of using mobile games.

H15 is supported. The standardized coefficient between satisfaction and continuous intention is $.254$, significant level $p < .001$, which indicates that satisfaction has a significantly positive effect on continuous intention. In this paper, satisfaction refers to an overall evaluation of the games after playing mobile games. The more satisfied users are with the use of mobile games, the stronger

willingness to continue using the game. It is consistent with the satisfaction to continuous usage intention in expectation confirmation model of information system continuance. As shown in (Figure 2).



(Figure 2) Results of Hypotheses Test

5. Conclusion

5.1 Theoretic Implications

We integrate user experience, network externalities and flow theory into expectation confirmation model and explore the influencing factors of continuous usage intention of mobile games in China from the perspective of marketing and propose a research model. We adopted game experience, service experience, perceived enjoyment, social interaction, challenge, perceived number of users and peers as independent variables. Flow, perceived value and satisfaction were mediating variables, as continuous intention was the dependent variable. We developed 19 hypotheses after collecting 426 valid sample data through a questionnaire survey. SPSS 22.0 software was used to conduct descriptive statistical analysis and reliability test. Then AMOS 22.0 was used to make confirmatory factor analysis, and a structural equation model to test these hypotheses. We find that four hypo-

theses are not supported, other 15 hypotheses have passed the empirical test to verify and explain the research model. The following are research implications :

- (1) We verify that expectation confirmation model of information system continuance is suitable in the context of mobile games. We introduce value theory to replace perceived usefulness of ECM with perceived value, which refers to the judgment or comparison between the benefit and costs in the context of mobile games. Perceived value is not just directly affect continuous intention but also has a significant positive impact on satisfaction, further indirectly affect continuous intention. Satisfaction positively influences continuous intention of using mobile games. It indicates that the evaluation of users' satisfaction with mobile games mainly depends on whether the mobile games can meet users' entertainment needs or interest. Also, the game process and subjective evaluation can be some of the dependent factors. The users will continue to use mobile games more actively, only if they are satisfied.
- (2) We verify that user experiences are the critical influencing factors on the continuous intention of using mobile games. In this study, we classify user experience into five dimensions : Game experience, service experience, perceived enjoyment, social interaction and challenge. These five dimensions are closely related to each other and have overall relevance. The game experience is the foundation to appealing games, which includes interactive interface design, style, sound, game functionality, plot background design and innovation, etc. and affect continuous intention. Excellent game operators and good

service experience are important factors to improve satisfaction, affect continuous usage intention and promote the sustainable development of the game. Perceived enjoyment indirectly affects user satisfaction through perceived value and flow, and perceived enjoyment has the strongest impact on perceived value. This conveys that the value of mobile games is a more hedonic experience, and the mobile game is an entertainment-oriented information system. Social interaction has a direct impact on flow. It shows that playing mobile games with friends can bring a significant flow experience. Also, users can mainly focus on cooperating with others to make mobile game more enjoyable and continue to stay committed. Although it can bring some adherence to the mobile game, it is still limited by the function of game products. Challenge positively influences flow, as it shows that appropriate challenges can improve game skills, thus further enhancing the user's sense of flow, thus retaining the user. Flow has an indirect impact on the continuous usage intention through satisfaction. The first step is to make users satisfied, which benefits from the realization of users' flow experience in activities.

- (3) We verify that network externalities are important influence factors on the continuous intention of using mobile game. In this study, network externalities are the direct network externalities, which are divided into perceived number of users and perceived number of peers. Perceived number of users has a positive influence on perceived value and flow, but it is not strong. It demonstrates that higher popularity means higher rate of users, which can take players more perceived benefits.

The user scale is one of the important factors affecting the sustainability in development of mobile games. It is different from the result of Chen et al. [2018], who found that weak influence tie (game's popularity) had no obvious effects on flow. Perceived number of peers has a direct positive impact on user satisfaction. This means mobile games have become the common interests and hobbies of many groups, and the behavior of players is significantly affected and restricted by their friends around them. The higher the rate of peer users, the more users are retained.

5.2 Practical Implications

According to the conclusion of empirical research, we suggest the following marketing strategies to improve the continuous intention of using mobile game by improving user experience and expectation satisfaction and extending network externalities.

- (1) Mobile game companies should improve the game experience as much as possible. A better game experience can directly retain users and extend the game life cycle. The design of mobile game should meet user's operating habits on mobile devices. As mobile games are most often used for entertainment in fragmented time, game developers should design game levels with a fast rhythm, short time consumption and high-performance perception. It is better to add the function of a network archive that can be suspended at any time to adapt to the fragmented media usage habits of modern people.

It is necessary to find out the differentiated position of mobile games, and design

the interactive interface, audio, role, and content of the game according to the core target user attributes and aesthetic preferences. For example, the game Onmyoji of NetEase focuses on the two dimensions groups who like Japanese "harmony" culture. Through the high-quality dubbing of famous brands, the exquisite and classical realistic backgrounds, the q-version character design, the complete world outlook, and the details of the mainline and branch line stories, the book has gained a lot of praise, which is worth learning from.

Game companies should ensure the integrity and fluency of game functions and avoid bugs. Mobile game developers should ensure the stability of the game engine and architecture, test repeatedly before the version iteration, and reduce bugs and fit it in time, to ensure the integrity of game functions. Mobile game developers should be continuously and appropriately adjust and update the numerical attributes in the game according to the user's game situation. On one hand, to ensure that the game has a certain challenge, on the other hand, when users are facing a long-term game challenge bottleneck period, proper adjustment of attributes can help users overcome the difficulties. This can make the game difficult and numerical system more reasonable, and give users some encouragement.

- (2) Mobile game companies should focus on exciting points of mobile game to take more enjoyment experience. On one hand, users should be constantly set with exciting points similar to or higher than their game level, so that users can sense the challenge and keep exciting. No matter whether the users succeed or fail in the challenge, they will stimulate a sense of immersion in the game : On the other

hand, giving a certain amount of information and setting certain tests in the story of the level can make users pay close attention to the world outlook and details of the game, which will also help to stimulate users' continuous interest in the game and create a good enjoyment experience. Setting up reward mechanisms such as award activity tasks, props, coupons and gold coins to users when recalling inactive users, which can stimulate users' activity and stickiness, reduce the user churns, and promote continuous intention by improving users' expectation satisfaction.

- (3) Mobile game companies should improve service quality and strengthen the construction of the social network of mobile game. Game operators should set up a feedback portal to guide users to give feedback regularly. Professional customer service should be trained to improve the response and processing speed of customer service for user needs or problems. Establish membership mechanism, provide different services such as exclusive props and discounts to meet personalized needs. Good service quality can effectively improve customer satisfaction and retain users.

The system of making friends, chatting and adding groups in the game has the problems of simple function and difficult operation, which lead to the players' indifference to the social relationship groups in the game. Therefore, mobile game developers should improve the system process of making friends and adding groups in the game, optimizing the relevant operation experience of chatting and adding groups, building interaction forms among users such as team task, mutually

helping and friending PK, and setting up incentive interaction mechanism to encourage users to actively interact with other users in the game. Developers and operators can introduce a social relationship chain in the game. The real social relationship is also the reflection of the real interpersonal relationship. Playing games with friends or participating in the ranking of friends' games will enhance the sense of honor and disgrace of users, and make users more immersed in the game.

- (4) Mobile game companies should extend network externalities through various marketing strategies. Such as word of mouth effect, multi-channel, Intellectual Property development. Game life cycles are growing shorter, in different stages of products, different marketing approaches can be adopted, and multi-directional interaction and contact with target users can be established. Through online and offline advertising, or film and television, game operators can reasonably choose advertising media and delivery forms according to different target groups, game types and brand tonality. Through topical marketing and excellent game quality, word-of-mouth communication can be formed. By creating topics on various social media platforms, the popularity and scope of discussion can be aroused, ultimately enhancing the network externality, attracting new active users, and retaining loyal followers.

Mobile game companies should establish multi-channel to access target users. Mobile game companies can cooperate with multiple app stores, game distribution platforms and mobile communication operators based on the personalized algorithm of "thousands of people and thousands of faces". According to

different user preferences, they can set up personalized recommendation areas or even traffic-free download areas, and give priority to display and provide the types of games that users are interested in, to reach the maximum extent by spreading channels reach the target group and expand the user group.

Mobile game companies should deeply develop mobile game Intellectual Property (IP). Recently, most of the mobile game independently developed in China come from the development of IP. For instance, most roles of Arena of Valor are well-known roles that come from history, traditional cultures, popular movies, and famous Chinese IP. Popular Strategy Games : Three Kingdoms strategic Edition and Immortal Conquest are the development of the Three Kingdoms history. The development of IP is the important mobile game innovation and the key point to go abroad from Chinese independent R&D mobile game.

5.3 Limitation and Further Research

Due to the limitations of time, energy, research scope, and other aspects, there are still some limitations and deficiencies. Some problems involved in the analysis have not been discussed in depth. It hopes that further improvement can be made in the future.

(1) Consider more types of mobile games. We mainly choose the samples of Arena of Valor (MOBA, multiplayer online battle arena) and Game for Peach (MMORPG, multiplayer online role-playing game) in this study, and we did not consider the different classification of mobile games such as mini-world and other lightweight mobile games. Therefore, further study can subdivide different types of mobile games, and study the continuous inten-

tion of different types of mobile game.

(2) Add controlled variables. We did not add controlled variables in this study, and the attributes of the survey sample are not strictly controlled. In further study, we can add some control variables to see whether there is some relationship among variables, which make the model more convincing.

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〈Appendix〉 Measurement Items

Measures items	Source
<p>Game experience (GEE)</p> <p>GE1: The screen and music design of the mobile game are attractive.</p> <p>GE2: The mobile game has clear goal and appropriate task, which can obtain a strong sense of achievement.</p> <p>GE3: The mobile game content is rich, high playability and surprising.</p> <p>GE4: The mobile game is innovative.</p>	<p>Merikivi et al. (2017); Delone and Mclean (2003)</p>
<p>Service experience (SEE)</p> <p>SQ1: I think when the users have some problems, the staff of this mobile game will show the ability of solving the problems.</p> <p>SQ2: Excellent staff of this mobile game will perform their services at right time.</p> <p>SQ3: It is easy to connect the staff when I need help.</p> <p>SQ4: A reliable and trust worth solution can be offered when user needs help.</p>	<p>Cristobal et al. (2007); Wang and Chen (2016)</p>
<p>Perceived enjoyment (PE)</p> <p>PE1: The mobile game I most often play is enjoyable.</p> <p>PE2: The mobile game I most often play is fun.</p> <p>PE3: The mobile game I most often play is entertaining.</p> <p>PE4: The mobile game I most often play is pleasant.</p>	<p>Merikivi et al. (2017); Hsiao and Tang (2016)</p>
<p>Social interaction (SI)</p> <p>SI1: Playing mobile games enables me to make friends</p> <p>SI2: I enjoy meeting the friends I made while playing mobile game.</p> <p>SI3: Communicating with others is useful for playing mobile game.</p> <p>SI4: Cooperating with others makes mobile game more enjoyable.</p>	<p>Chang (2013)</p>
<p>Challenge (CHA)</p> <p>CHA1: Playing the mobile game challenges me.</p> <p>CHA2: Playing the mobile game provides a good test of my playing skills.</p> <p>CHA3: Playing the mobile game challenges me to perform the best of my ability.</p> <p>CHA4: Playing the mobile game makes me think.</p>	<p>Merikivi et al. (2017); Koufaris (2002)</p>
<p>Perceived number of users (PNOU)</p> <p>PNOU1: I notice that a good number of people play the mobile game.</p> <p>PNOU2: I notice that most people play the mobile game.</p> <p>PNOU3: I notice that there will be many more people playing the mobile games in the future.</p>	<p>Wei and Lu (2014)</p>
<p>Perceived number of peers (PNOP)</p> <p>PNOP1: Some of my friends/family enjoys playing the mobile game.</p> <p>PNOP2: Most of my friends/family plays the mobile game.</p> <p>PNOP3: My friends/family there and I have discussions about the mobile game.</p>	<p>Wei and Lu (2014)</p>
<p>Flow (FW)</p> <p>FW1: I think I lose the sense of time and feel that time flies while playing the mobile game.</p> <p>FW2: I fell curious while playing the mobile game.</p> <p>FW3: I think I will focus exclusively while playing the mobile game.</p>	<p>Csikszentmihalyi (1989); Chen et al. (2018)</p>
<p>Perceive value (PV)</p> <p>PV1: Compared to the fee I need to pay, the use of mobile game offers value for money.</p> <p>PV2: Compared to the effort I need to put in, the use of mobile game is beneficial to me.</p> <p>PV3: Compared to the time I need to spend, the use of mobile game is worthwhile to me.</p>	<p>Kim et al. (2007); Wang et al. (2013)</p>
<p>Satisfaction (SAT)</p> <p>SAT1: I am satisfied with using the mobile game.</p> <p>SAT2: I am contented with using the mobile game.</p> <p>SAT3: My decision to using the mobile game is a wise one.</p> <p>SAT4: I thing using the mobile game is a good idea.</p>	<p>Bhattacharjee (2001) Chang (2013)</p>
<p>Continuous intention (CI)</p> <p>CI1: I intend to continue playing the mobile game.</p> <p>CI2: Compared to other games, I will continue to play the mobile game in the future.</p> <p>CI3: I will play the mobile game frequently in the future.</p> <p>CI4: I will recommend the mobile game to relatives and friends.</p>	<p>Bhattacharjee (2001) Merikivi et al. (2017)</p>

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