2014

WHY DO I INVITE FRIENDS TO JOIN: AN EMPIRICAL STUDY OF MOBILE SOCIAL NETWORK GAME

Yi Ding  
National University of Singapore, yiding@comp.nus.edu.sg

Ya Zhou  
National University of Singapore, zhouya@comp.nus.edu.sg

Atreyi Kankanhalli  
National University of Singapore, atreyi@comp.nus.edu.sg

Follow this and additional works at: http://aisel.aisnet.org/pacis2014

Recommended Citation  
Ding, Yi; Zhou, Ya; and Kankanhalli, Atreyi, "WHY DO I INVITE FRIENDS TO JOIN: AN EMPIRICAL STUDY OF MOBILE SOCIAL NETWORK GAME" (2014). PACIS 2014 Proceedings. 137.  
http://aisel.aisnet.org/pacis2014/137

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2014 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
WHY DO I INVITE FRIENDS TO JOIN: AN EMPIRICAL STUDY OF MOBILE SOCIAL NETWORK GAME

Yi Ding, School of Computing, National University of Singapore, Singapore, 
yiding@comp.nus.edu.sg

Ya Zhou, School of Computing, National University of Singapore, Singapore, 
zhouya@comp.nus.edu.sg

Atreyi Kankanhalli, School of Computing, National University of Singapore, Singapore, 
atreyi@comp.nus.edu.sg

Abstract

With the prevalence of mobile devices and access to social networks, an increasing number of people are playing mobile social network games. This type of game differs from traditional online games with new capabilities of convenient mobile use and access to social networks. Despite the popularity of mobile social network games, there are limited studies in this field. Particularly, there is a lack of understandings of players’ motivations to play the game, and what would make them invite others to join the game. Our study addresses this gap by developing a model to explain what motivates players to join the game and under what circumstances they are willing to invite others to join the game. The model is tested by survey. Our results show that mobility motivates players to enter the game and have recreational play, while desire for advancement, relationship building and escapism motivate them to high engagement play. Meanwhile, high engagement play is positively related to players’ intention to invite their social network friends.

Keywords: mobile, social network game, motivation, referral
1 INTRODUCTION

With the development of social media, social network games (SNG) are gaining popularity. One of the popular social network games is Candy Crush based on Facebook. It is a match-three puzzle video game released in April, 2012 for Facebook, and in November, 2012 for smartphones. The game quickly surpassed all the other games and became the most popular game App on Facebook. According to a recent report, Candy Crush has reached around 93 million active players in January 2014 and gets ready to go public (Grubb 2014). A recent report about social gaming industry anticipates that the worldwide social gaming market size would reach 8.64 billion by the end of 2014 (GO-Gulf.com 2013). 50% of social networking users and 34% of total internet users will play social games by that time. Given the growing mobile technology, mobile social network game (MSNG) has become a trend (Park et al. 2013).

Most mobile social network games are primarily monetized through in-app purchases. When players exhaust their lives, or are advancing to new ‘episodes’, they must either purchase, or receive requests from social network friends. The strategy here is to expand the game market, which in turn generates more profit for the firm. It is crucial for game firms to obtain new players and expand game market. Bitfold, a research centre for online games, reveals that many social network games fail to attract and maintain players because they do not understand players’ motivations and behaviors (Turner 2011). It is important for game firms, especially game designers, to be aware of players’ motivations towards the game, which are helpful for targeted design improvement. Conventionally, there are studies addressing motivations of online game players (Yee 2006; Wan and Chiou 2006). They suggest that people are motivated to play games because of achievement sense, social visibility and immersion. However, there is a lack of literatures evaluating this issue in the context of mobile social network game.

Among existing players, some are willing to invite new friends to the game while others are not. The former type of players helps expand the game market which is desired by firms. However, in reality, firms usually do not differentiate players. Thus they are unable to allocate their marketing resources efficiently. Recognizing different players and their willingness to spread referral message provides implications for firms to take target marketing. However, there is a lack of studies into this issue. These two research gaps motivated us to answer: (1) what are the motivations of different types of players in mobile social network games; (2) What kind of players are willing to invite their friends to join the game?

Hence, this study differentiates social network game players according to their game play state. We also investigate their respective motivations and intentions to invite friends in the mobile context. The model was developed based on “Player Motivation Factor Model” and was tested using survey and partial least squares method. Our results show that the capability of mobility enables people for recreational play, while desires for advancement, relationship building and escapism motivate them to play in high engagement state. Accordingly, high engaged players are willing to invite their friends, while players for recreation are not. In the next section, we present theoretical background for this study.

2 CONCEPTUAL BACKGROUND

2.1 Mobile social network game

A social network game (SNG) is distributed primarily through social networks and accessible in social media (Kleinman, 2009). They may be equipped with the characteristics of asynchronous gameplay and community (Radoff 2011). More recently, social network games are implemented on other platforms, especially mobile devices which are called mobile social network game (Park et al. 2007). With the presence of mobile technologies, mobile social network games (MSNGs) are becoming popular. The majority of MSNGs provide services based mainly on two parts: enjoyable tasks and usefulness. Those based on enjoyable tasks like many other games provide players with fun
and entertainment (Ha et al. 2007; Shin and Shin 2011). In terms of usefulness of games, MSNGs effectively incorporate the context of SNS. Through use of these games by players, the players enhance their relationships with others and garner a sense of communication in virtual reality (Rau et al., 2008). This enables users to interact with each other through social networks via convenient mobile technology.

A number of studies have been done in the area of social network games. Usage of players’ social network background distinguishes SNGs as a unique subset of digital games. Shin and Shin (2010) proposed a theoretical framework of motivation-based decision-making process for SNGs acceptance, and found that distinct established constructs, i.e. perceived enjoyment and perceived security of SNGs, are valid. From a mass communication perspective, Woh and Lee (2013) studied motivations of users with different characteristics by observing how they play SNGs. Surprisingly, they found that more people were using social network games as a coping mechanism and to pass time rather than using it for social purposes. Chang (2012) studied interaction and user value as antecedents of satisfaction and flow experience; furthermore influences SNG continuance. He revealed that flow experience was an important mediator for SNG continuance. As for mobile social network games, this is such a new area that limited studies can be found. Among these, Park et al. (2013) investigated the determinants of player acceptance of mobile social network games. They extended technology acceptance model and revealed that attitudes and satisfaction can positively influence players’ intention to use. However, given the new context of mobility, little light is shed on its role to motivate people to play MSNG. Meanwhile, while substantial studies investigated the motivations of game playing, there are few studies looking into the players’ consequent behaviors (i.e. referral message) which may have implications for game companies. Our study is motivated mainly by these two research gaps.

Existing studies have divided online game behaviors into several states according to players’ engagement levels. For example, Charlton and Danforth (2005) introduced the concept of high engagement from computer usage (Charlton and Birkett, 1995) to online game playing, describing it as non-pathological high degree of playing. However, little light is shed on this non-pathological high engagement level as well as initial low engagement level of recreational game playing. These playing states reflect players’ attitudes and potentially predict their subsequent behaviors (O’Brien, 2010). In our research context, MSNG provides a suitable platform to explore characteristics of these players’ states due to the relatively simple game rules. We propose two different playing states of MSNG: recreational play and high engagement play. Recreational play denotes the entry level of mobile social network game play, in which state users devote limited time and efforts to the game. High engagement play indicates high degree of playing non-pathologically, where players spend more time in the game. In order to find out the respective motivations of the two states of MSNG play, we refer to “Player Motivation Factor Model”.

2.2 Player Motivation Factor Model

In the online gaming context, there are several mature studies addressing different motivations towards game playing. One of the most popular streams stems from the work of Wan and Chiou (2006). Wan and Chiou (2006) concluded that people playing online games derives from three types of needs: sense of achievement, social visibility, and feeling of immersion. Subsequently, Yee (2006) suggested the Player Motivation Factors Model which contains three groups of game playing motivations that are consistent with Wan and Chiou (2006)’s study. They are need for achievement, need for socialization, and need for immersion. Each group contains sub-dimensions as decomposition. The main sub-dimensions are players’ desire for advancement in need for achievement, desire of relationship building in need of socialization and desire of escapism in need for immersion. Some of these sub-dimensions have been tested in the empirical studies in the online game context (Xu et al. 2012). However, there is a lack of studies testing players’ motivations in the MSNG context. Besides the antecedents of MSNG playing (i.e. motivations), we refer to customer engagement theories to study the players’ consequent behaviors of the game playing.
2.3 Customer Engagement

The verb “to engage” has several different meanings according to the Oxford Dictionary (1996). Important meanings include to take part and to involve (Van Doorn et al. 2010). In the marketing area, a considerable amount of literature has addressed the importance of customer engagement. Customer engagement is defined as a customer’s behavioral manifestation toward a brand or a firm and it results from motivational drivers (Van Doorn et al., 2010). It is regarded as a state of connectedness between the customer and the firm, rather than merely liking (Calder and Malthouse 2008). Several researchers argue that customer engagement behaviors go beyond transactions. Kumar et al. (2010) concluded customer engagement value (CEV) as customer lifetime value, referral value, influencer value and knowledge value. Adapted to our MSNG context, we emphasize the former three values because there is limited knowledge interaction between MSNG players and the game companies. Customer lifetime value indicates value from customers’ purchase behavior. An analogy in MSNG is players’ continuous use of the game. Customer referral value is related to incentivized referral of new customers. Customer influencer value includes the customer’s behavior to influence other customers, increasing acquisition, retention, and share of wallet through word of mouth among existing customers as well as prospects. In this study, we examine the outcomes of players’ referral and influence on others which is designed by the MSNG function, i.e. invitation.

3 MODEL DEVELOPMENT

Figure 1. Research Model

3.1 Mobility and Recreational Play

In this study, mobility refers to convenience brought by a time- and place-independent computing environment (Mallat et al. 2009). Mobility is the unique feature of MSNG compared to traditional SNG. It enables users to get access to the SNG ubiquitously via wireless networks and mobile devices, such as smartphones and tablets. Researchers have found that mobility is positively related to the acceptance of various mobile services, like mobile learning (Huang et al, 2007), mobile ticketing (Mallat et al. 2009) and mobile payment (Schierz et al. 2010). Similarly, for mobile games, the convenience of mobility has been found to impact users’ hedonic perceptions and serve as a strong predictor for mobile game adoption (Liu and Li 2011). Ha et al. (2007) also emphasized that current mobile technology extends the mobility of previous games and thereby improves users’ adoption rate. As recreational play is an initial playing state close to acceptance. We hypothesize:

H1: Mobility in MSNG is positively related to recreational play.

3.2 Motivation and High Engagement Play

Player motivation factor model provides us with three perspectives of motivations which induce online game playing, i.e. desire for achievement, relationship, and immersion, which are also the most
common functional motivations in the game playing literature. Researchers found that the players who aim to build or maintain relationship, pursue advancement, or escape from the real world through playing games, are more likely to be highly engaged in the games (Billieux et al. 2013; Joe and Chiu 2009; Xu et al. 2011; Xu and Tan 2012).

3.2.1 Relationship

Relationship refers to the desire to find and give support, and interact with others (Xu et al. 2012). Most junior M-SNG players gain the game information from the respective social networks (e.g. Candy Crush from Facebook). This type of reference leads them to enter the M-SNG and obtain recreation from the game. Moreover, with increasing time spent on the game, players accumulate relationships and the social ties between players might be strengthened. In traditional game media, like Massively Multiplayer Online Game in the Internet, length of playing time has been found to be strongly associated with the motivation of relationship building (Billieux et al., 2013). Moreover, continual needs for relationship can also deepen game addiction (Xu et al., 2011). This is also supported by extant studies which indicated that maintaining social relationship and socializing through game playing is an important motivation to keep players staying in the game (Joe and Chiu 2009). Thus we hypothesize that

H2: Desire for relationship building in MSNG is positively related to high engagement play.

3.2.2 Advancement

Advancement indicates the desire to gain progress, power, accumulation and status (Xu et al. 2012). Game players with strong desire for advancement are likely to spend more time and efforts on the focal game. Advancement is unlikely to be obtained without repeat attempts and practice. Previous work also revealed that the virtual power-status is one factor keeping people involved in game playing (Joe and Chiu 2009). Moreover, in tradition game media, an addictive usage pattern has been found to be mainly influenced by advancement (Billieux et al, 2013). In the context of M-SNG, the effect may be enhanced because of the public view of game rank within the social network. Thus, players motivated by advancement are considered to be in high engagement play.

H3: Desire for advancement in MSNG is positively related to high engagement play.

3.2.3 Escapism

Escapism refers to the need to avoid thinking about real life problems through immersion in the game (Xu et al. 2012). Pre-existing depression and mood disorders are common among users who develop problematic usage of online games (Yee 2006). Adolescents may escape from the real life problems through online game playing day and night. Previous research demonstrated that escapism emerges as the best predictor of game addiction (Yee 2006). Thus, escapism is considered to motivate people to be highly involved in the game.

H4: Desire for escapism is positively related to high engagement play.

3.3 High Engagement Play and Invitation

High engagement play indicates a high degree of MSNG usage but no pathological consequences on players’ life (Charlton and Danforth 2007). Customer engagement value model provides an explanation of various behavioral outcomes when people are engaged with the firm (Van Doorn et al. 2010). In our research context, high engagement play captures players’ engagement levels of the game. It measures user’s hedonic and immersing experience as well as time consumed in the game. This process helps build emotional bond between customers and the game (Kumar et al., 2010). This high engaged state may lead to certain behaviors. According to Kumar et al. (2010)’s customer engagement value (CEV) model, when players are high engaged in the game, they are more likely to influence their friends with referrals (referral value and influencer value). These kinds of behaviors may not be common for those players who just enter the game because they are not enough involved
in the game (Kumar et al., 2010). For a mobile social network game company, this kind of player’s recommendations would increase new player acquisition and expand their market share. We posit:

H5: High engagement play is positively related to players’ invitation behavior.

4 METHOD

Our model was tested by survey and partial linear square method in the MSNG context of Candy Crush. Candy Crush is a variation of match-three games. Each level has a game board filled with differently coloured candies, and might contain obstacles. They must be completed in a given number of moves (or on a time limit). Candy Crush is primarily monetized through in-app purchase (through either a credit card or Facebook Credits). Players begin with five ‘lives’, lost whenever a level is failed. They can either send requests to their Facebook friends for more lives, wait for replenishment or purchase lives. At certain points to new ‘episodes’, players must either purchase or receive ‘tickets’ from friends (Thomas 2013). The game was released by the developer King in April, 2012 for Facebook, and in November, 2012 for smartphones.

The survey in this study (see Appendix) was developed after adapting existing constructs to mobile social network game context. Items of recreational play, high engagement play (Chesney 2008), advancement, relationship and escapism (Xu et al. 2012) were developed from existing literature and adapted to this research. As no direct items were found for mobility and invitation, we developed items for these two constructs referring to their definition in existing literatures (Mallat et al. 2009). A seven-point Likert scale (1=strongly disagree; 7=strongly agree) was adopted for the measurement. Since there were new items introduced, we conducted a two-round item sorting process to develop the final questionnaire (Moore and Benbasat 1991). In the second round, average Cohen’s Kappa 0.91 indicated a well-developed questionnaire.

The survey was distributed through both online and offline channels. The recipients of offline survey were from a large public university in Singapore and those of online survey mainly consist of university students and white collars in China. All the recipients have the experience of Candy Crush play on mobiles. Young people were selected because they are the targeted customers of the game (Michael 2013). We got 152 responses in total. Among these responses, 27 are invalid with missing values and obvious outliers. We dropped these responses before we analyze the data. The valid 125 responses constitute of 57 males and 68 females. 43 of them are from Singapore, 77 are from China, while another 5 are from other countries. Most of these recipients are young aging from 20 to 23 (91 in total). 10 of them are younger than 20 years old; 20 of them fall into the age range of 24 to 27, and other 4 are older than 27.

5 RESULTS AND DISCUSSION

Before testing the hypotheses, we conducted exploratory factor analysis (EFA) in the form of principal component analysis (PCA) and confirmatory factor analysis (CFA) to test the measurement model. Meanwhile, we also assessed the measurement invariance for responses from different survey channels and find respondents from the two channels interpreting the questionnaire in the same way ($\Delta \chi^2=25.5$, $\Delta \text{dof}=23$ and p-value=$0.32>0.05$). SmartPLS 2.0 was employed for hypotheses testing and Stata 12.0 was used to detect multicollinearity.

5.1 Measurement model

Based on the results of EFA, we dropped one item which had the cross-loading problem (i.e. rec3 for recreational play). The first component in PCA extracts 33.94% variance, indicating there is no common method bias in this study. Then we conducted CFA and found the factor solution to be reasonable. Table 1 shows the result of CFA. As can be seen, AVE of all constructs are larger than 0.5, composite factor reliability (CFR) and Cronbach’s alpha of all constructs are larger than 0.7. Because all criteria are satisfied (Fornell and Larcker 1981; Nunnally 1978), convergent validity of the items is confirmed.
As for the discriminant validity, correlations between constructs (except between escapism & high engagement play and relationship & invitation) are below 0.6 and are less than the root AVE of corresponding constructs (Fornell and Larcker 1981). To further confirm the discriminant validity, we constrained the correlation of each pair of constructs to 1 and performed chi-square difference tests (MacKenzie et al. 2011). The result shows differences between all pairs are significant (greater than 3). This indicates all pairs of the constructs cannot be substituted by a single construct and thus they are proven to meet discriminant validity criteria.

Before hypotheses testing, we conducted multicollinearity test. Latent variable scores (derived from SmartPLS 2.0) were used as input in Stata 12.0 to calculate variance inflation factor (VIF). As in Table 2 we can see that all VIF in two models are less than 5, representing no multicollinearity issue in this study (O'brien 2007).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Recreational Play</th>
<th>High Engagement Play</th>
<th>Mobility</th>
<th>Advancement</th>
<th>Relationship</th>
<th>Escapism</th>
<th>Invitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advancement</td>
<td>1.45</td>
<td>0.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td>1.31</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escapism</td>
<td>1.30</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*diagonal elements represent the square root of the average variance extracted for the respective construct

**Table 1. CFA result and construct correlation**

<table>
<thead>
<tr>
<th>DV: Recreational play</th>
<th>DV: Invitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advancement</td>
<td>1.24</td>
</tr>
<tr>
<td>Relationship</td>
<td>1.20</td>
</tr>
<tr>
<td>Escapism</td>
<td>1.04</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.12</td>
</tr>
</tbody>
</table>

**Table 2. Result of VIF**

5.2 Hypotheses testing

We used SmartPLS 2.0 to test our hypotheses. The results (Table 3) show that all hypotheses are supported. As can be seen, mobility is significantly positively related to recreational play (H1 is supported), while relationship, advancement and escapism have significantly positive association with high engagement play (H2, H3 and H4 are supported). Consistent with our expectation, players in high engagement play are driven to invite their friends to join them (H5 is supported).
Path | Coefficient | T-value | Hypotheses | R square |
---|---|---|---|---|
Mobility -> recreation (H1) | 0.39** | 4.83 | Supported | 0.15 |
Relationship -> high engagement (H2) | 0.19** | 2.33 | Supported | |
Advancement -> high engagement (H3) | 0.22** | 2.50 | Supported | |
Escapism -> high engagement (H4) | 0.51** | 6.53 | Supported | 0.56 |
High engagement -> invitation (H5) | 0.43** | 4.98 | Supported | |
Age -> invitation | -0.12 | 0.72 | - | |
Gender -> invitation | -0.16* | 1.75 | - | |
Nationality -> invitation | 0.38** | 3.91 | - | 0.33

* p<0.05, ** p<0.01.

Table 3. Result of hypotheses testing

The results indicate that the capability of mobility enables recreational play. Mobility provides a recreational resource for players without time and space restrictions. Compared with conventional games, MSNG with the feature of mobility provides users an easier way to pass time for entertainment. On the other hand, consistent with prior studies (Xu et al. 2011; Billieux et al. 2013), our findings also suggest that desires for advancement, relationship building and escapism drive players to be highly engaged in mobile social network game. Similar to traditional games, many MSNG players pay attention to the advancing mechanisms. For example, Candy Crush contains episodes which include 30 levels. There are incremental difficulties when players are levelling up. This attracts players to be more engaged as revealed in the results. Moreover, MSNG serves as a platform for players to build relationships due to their embedded social nature. Most of these MSNG provide natural opportunities for players to communicate, such as sharing game ranks among social network friends. In addition, the findings show that players, who consider MSNG as a way to escape from the real world, seem to be more engaged in the game than those pursuing advancement and relationships. These findings imply that even though the context of mobile social network game is unique in some aspects, some traditional factors that are strongly related to game addiction, like relationship, advancement and escapism, are still applicable in the analysis of excessive game play.

Players in high engagement state show significant intention to send invitations. This is consistent with marketing literature findings that highly engaged players are motivated to send recommendations to their friends (Van Doorn et al. 2010). The reason behind this may be that the more time and effort one devotes in the game, the tighter emotional bond built between the game and the player. People tend to share good things with friends (Gable et al. 2004), thus it is natural for players to share the MSNG play with their friends.

Interestingly, our findings suggest that compared to Singaporeans, Chinese players are more likely to send invitation for M-SNG. This may be because Chinese have long tradition in the emphasis of relationship building and maintaining as resources, and tend to take advantage of all available channels to keep connected with friends (Chang & Holt 1991). In addition to the difference generated by nationality, our findings also indicate that males are more willing to send invitations than females. Gender culture studies give a possible explanation that communication among males emphasizes on doing the same thing, like playing game together, while females tend to maintain relationships by sharing emotions (Wright 1982; Winstead 1986).
5.3 Post-hoc test

<table>
<thead>
<tr>
<th>Path</th>
<th>Coefficient</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility -&gt; recreation (H1)</td>
<td>0.37**</td>
<td>3.41</td>
</tr>
<tr>
<td>Mobility -&gt; high engagement</td>
<td>0.04</td>
<td>0.46</td>
</tr>
<tr>
<td>Relationship -&gt; recreation</td>
<td>0.09</td>
<td>0.83</td>
</tr>
<tr>
<td>Relationship -&gt; high engagement (H2)</td>
<td>0.18**</td>
<td>2.02</td>
</tr>
<tr>
<td>Advancement -&gt; recreation</td>
<td>0.04</td>
<td>0.29</td>
</tr>
<tr>
<td>Advancement -&gt; high engagement (H3)</td>
<td>0.22**</td>
<td>2.64</td>
</tr>
<tr>
<td>Escapism -&gt; recreation</td>
<td>-0.06</td>
<td>0.48</td>
</tr>
<tr>
<td>Escapism -&gt; high engagement (H4)</td>
<td>0.51**</td>
<td>6.07</td>
</tr>
<tr>
<td>Recreation -&gt; invitation</td>
<td>-0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>High engagement -&gt; invitation (H5)</td>
<td>0.43**</td>
<td>5.27</td>
</tr>
<tr>
<td>Age -&gt; invitation</td>
<td>-0.12</td>
<td>0.74</td>
</tr>
<tr>
<td>Gender -&gt; invitation</td>
<td>-0.16**</td>
<td>1.91</td>
</tr>
<tr>
<td>Nationality -&gt; invitation</td>
<td>0.38**</td>
<td>3.93</td>
</tr>
</tbody>
</table>

* p<0.05, ** p<0.01.

Table 4. Result of post hoc testing

As can be seen from table 4, we conducted a full model testing of all the possible relationships within the model. The result shows that apart from those we hypothesized, the rest of the relationships are not supported by the data. This provides a further validation for our model.

6 IMPLICATIONS AND LIMITATIONS

6.1 Theoretical contributions

Our study provides several theoretical contributions. First of all, it contributes to existing literature of mobile games by empirically demonstrating the role of mobility as an enabler for players to enter the game. The transformation of games into mobile world dramatically changes the way of playing. The recent research focus of mobile social network game is mainly about game adoption (Park et al. 2007) and players’ experience and perception (Engl and Nacke 2013; Liu and Li 2011). Our study extends the literature by shedding light on the role of mobility to involve potential users in recreational play.

Second, by testing important factors of player motivation factor model (Yee 2006) in the new context of M-SNG, we validate that in the mobile context, results from previous studies on game playing motivations are still applicable. For example, desire for relationship building, advancement and escapism which have been proven to be strongly related to intensive play (Billieux et al., 2013; Joe and Chiu 2009), still work in this new context. In this sense, this study bridges the gap between research on traditional game media and that in mobile context.

Third, we differentiate two types of MSNG play, i.e. recreational play and high engagement play. Corresponding motivations of these two types of play are revealed through this study. Previous studies generally regard game playing as a unique state to investigate its motivations, or simply distinguish extreme state with pathological damages (e.g. game addiction) (Billieux et al. 2013; Griffiths et al 2012; Xu et al., 2011). This study extends the current social network game research by introducing the two types of game play measuring different levels of usage.

In addition to antecedents of different game play types, we also explore the consequences of game playing of players’ referral behaviors. According to customer engagement value theories (Kumar et al. 2010; Van Doorn et al. 2010), when customers are highly engaged in and build emotional bond with a certain firm, they are more likely to recommend it to their friends. Our findings confirm the application of this idea in game playing, and show that players in high engagement are willing to invite their social network friends while players with recreational play are not.
6.2 Practical implication

This study also provides several practical implications. For game firms, especially game designers, our results suggest that mobility acts as an enabler for recreational play, while needs of advancement, relationship building and escapism motivate players to be more engaged. This encourages current social network games to step into the mobile field, which is helpful for new player acquisition. Meanwhile, if MSNG want to retain players, attractive advancing mechanisms and more socializing functions (e.g. ranking among social network friends) will be of value.

For firm’s marketing strategies, our study suggests to allocate more marketing resources on people with high engagement play. This type of players is shown to be willing to invite their social network friends to join in the game, which expands the game market. Accordingly, in order to get players to be highly engaged in the game, game designers should think more carefully about advancing mechanism and socializing function.

6.3 Limitations and future work

The findings from this study need to be interpreted in light of its limitations, which may also point to potential future research directions. First, our sample size is limited. In order to gain better external validity of our findings, further research can validate the model by using larger sample as well as diversifying respondents.

Second, even though our results show that there are country and gender differences in players’ invitation behaviors as predicted by literature (Chang & Holt 1991; Wright 1982; Winstead 1986), we do not examine the underlying mechanisms which result in these differences, especially in the context of game playing. Further research can address this problem through cross-cultural analysis and make it clear why people from different countries, and why females and males have different MSNG invitation patterns.

Lastly, most players generally stay in state of recreational play or high engagement play since MSNG is relatively simple. However, as the results also indicate that traditional motivations of game addiction keep playing a significant role in high engagement play of MSNG, addictive use may still exist among these MSNG players. By further diversifying players’ types or conducting longitude studies, more play patterns could be examined in the context of MSNG.

7 CONCLUSION

This study builds and validates a model for motivation of two game playing types: recreational play and high engagement play. Our findings suggest that some motivations for traditional game media are still applicable for the MSNG. Furthermore, we introduced mobility as a motivation of recreational play in the context of MSNG. In addition to antecedents of game playing, we also explore the outcome of game playing. Our results indicate most players with high engagement play are more likely to invite friends to join them, and imply that possible actions targeting motivations can be taken to promote MSNG play. Given the tremendous growth of this industry, more research on this topic is warranted.
References


Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. Journal of marketing research, 382-388.


### Appendix: Constructs and Items of the Research Model (1- strongly disagree; 7- strongly agree)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
<th>Item</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>To what extent people desire the convenience of this game</td>
<td>mob1: I play M-SNG because it is easy to access at any time</td>
<td>Mallat et al. (2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mob2: I play M-SNG because it is easy to access wherever I am</td>
<td></td>
</tr>
<tr>
<td>Advancement</td>
<td>To what extent people desire to gain progress, power, accumulation and status</td>
<td>adv1: It is important for me to level up my game level of M-SNG as fast as possible</td>
<td>Xu et al. (2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>adv2: It is important for me to become powerful in mobile social network game</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>adv3: It is important for me to rank high on the mobile social network game</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>adv4: It is important for me to be well-known in the mobile social network game</td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td>To what extent people desire to find and give support and interact with others</td>
<td>rel1: I often have interesting conversations with other M-SNG players</td>
<td>Xu et al. (2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rel2: I usually talk to my friends who also play M-SNG through social networks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>rel3: My friends who also play M-SNG usually offer me support when I have a problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>rel4: I have a lot of interaction with my friends who also play M-SNG with me</td>
<td></td>
</tr>
<tr>
<td>Escapism</td>
<td>To what extent people desire to avoid thinking about real life problems through immersion in the game</td>
<td>esc1: I usually play M-SNG so I can avoid thinking about some of real-life problems or worries.</td>
<td>Xu et al. (2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>esc2: I usually play M-SNG in order to relax from the day's work or study stress.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>esc3: I often use M-SNG playing to escape from the real world problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>esc4: I often use M-SNG playing to release my depression.</td>
<td></td>
</tr>
<tr>
<td>Recreational Play</td>
<td>Light game usage when the purpose of playing is just for entertainment</td>
<td>rec1: Playing M-SNG is a good way of passing the time</td>
<td>Thomas Chesney (2008)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rec2: I play M-SNG only when I have some spare time</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>rec3: I could stay a long time not playing M-SNG</td>
<td></td>
</tr>
<tr>
<td>High Engagement Play</td>
<td>A high degree of game usage but no pathological consequences on players’ life</td>
<td>high1: I often think about M-SNG when I am not playing</td>
<td>Charlton &amp; Danforth (2007)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high2: I feel happy at the thought of playing M-SNG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>high3: I have found myself playing M-SNG for a longer time to get the same enjoyment</td>
<td></td>
</tr>
<tr>
<td>Invitation</td>
<td>The degree to which players are willing to invite their social network friends to join in</td>
<td>inv1: I would like to invite my friends on social network to play M-SNG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>inv2: I have sent invitations to invite my friends on social network to play M-SNG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>inv3: I feel happy when I send invitations of M-SNG to my friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>inv4: I feel motivated to invite my friends when I am playing M-SNG</td>
<td></td>
</tr>
</tbody>
</table>