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EXPLORING THE EMPIRICAL LINK BETWEEN GAME FEATURES, PLAYER MOTIVATION, AND GAME BEHAVIOR

Research in Progress

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Abstract

This research-in-progress paper aims to propose a framework for predicting use continuance and subsequent in-game purchases in the context of online, free-to-play (F2P) mobile games. Using previous games research, we first propose Perceived Enjoyment (PE) and Use Continuance (UC) as the key predictors of Purchase Intention (PI). However, in order to extend the extant literature and generate practical insights for game developers into how to enhance the level of PE and UC generated by their games, we further explore the relations between a set of technical game features and their impact on users' motivations for playing online F2P mobile games. Specifically, we look at three groups of features—connect, bonding, and share-in features—and test their effect on three key motivations underpinning perceived enjoyment in the context of digital game play, namely Achievement, Social, and Immersion motivations. Using data from a scenario-based questionnaire, our findings show that although all three motivations—Achievement, Social, and Immersion—result in greater enjoyment, and in turn, use continuance and purchase intention, only a single technical feature of the games—namely the share-in feature—triggers greater perceived immersion motivation. Implications for theory and practice are discussed.

Keywords: Digital games, mobile games, game features, motivations, perceived enjoyment, use continuance, purchase intention

1 Introduction

Interactive entertainment is the commonly used term to refer to video or digital games and differs from other domains of entertainment given the active role of the user in generating entertainment value. The interactive entertainment industry has burgeoned over the past decades and is now comparable in size to film or music (Dupuy Fromy, 2012). A distinctive feature of the interactive entertainment industry is the presence of multiple stages of technological innovation (Isaacson, 2014). One of the most recent examples of such an innovation stage is the proliferation of mobile games; mobile gamers now account for over one-third of the gaming population, a number that is expected to grow to over one-half by 2018 (Verna, 2014). Furthermore, mobile gaming is the fastest growing segment of the industry and forecasted to become the largest segment in terms of revenues by 2017 (Newzoo, 2016).

Online mobile games are unique in several ways. First, games are available on the Internet, allowing the player to directly interact with other gamers. As such, the fast growing adoption and use of mobile games could be partially attributed to network effects associated with the social nature of online game play (Liu, 2010; Shankar and Bayus, 2003). Second, novel revenue models have also emerged with the proliferation of online games. Rather than selling for a fixed price, online games are frequently offered using one of three revenue models: 1) subscription, such as with the game 'World of Warcraft'; 2) hybrid, i.e. combining an initial small fixed price for acquiring the game and a recurring subscription fee, e.g., the game 'Star Wars'; 3) freemium or free-to-play (F2P), which can be downloaded and played for free; however, within-game micro-transactions are possible to enrich the gaming experience. The freemium revenue model has become particularly common for mobile games (Anderson, 2010) and many popular games have shifted from hybrid or subscription models to freemium models in recent years. The F2P model has resulted in a tremendous surge in active game players (Laughlin, 2012).

Given the overall burgeoning of mobile games and specifically F2P games, this study focuses on mobile, F2P games and centers on the following research question: *What is the effect of different game features in online F2P mobile games on use continuance and in-game purchase intention?*

The remainder of this paper is organized as follows. First, findings from extant game research will be used to set the stage for proposing the theoretical framework underpinning this study. Then, we will present the methodology, research model, and research design. Finally, we discuss preliminary findings from second-generation statistical testing, outline future steps for this in-progress study, and present implications and limitations.

2 Theoretical Background

In this section, we outline the theoretical background for the core components of our theoretical framework, including gameplay motivations, technical game features that may foster increased gameplay motivations, as well as broader game, information systems, and consumer research literatures for understanding perceived enjoyment (PE), use continuance (UC), and in-game purchase intention (PI).

2.1 Gameplay Motivations: The Component Model

Understanding player motivation has been one of the most researched topics in game studies over the past decade. The Self-Determination Theory (SDT) proposed by Deci and Ryan (1985) established a framework for the study of human motivation, which was applied in the context of video games by Ryan *et al*. (2006). Specifically, autonomy (control over the game), competence (in-game performance) and relatedness (in-game relationships) were crucial motivations for gamers and increased their overall drive to play.

An alternative model was proposed by Yee (2006), the Player Motivation Model, which was adapted from Bartle's (1996) Player Types Model. Yee (2006) found that three main components characterize

motivations to play games, namely: *Achievement* (advancement, mechanics, competition), *Social* (socializing, relationship, teamwork) and *Immersion* (discovery, customization, role-playing, escapism). Given that Yee's model, as opposed to Ryan's et al.'s (2006) model, was based on data gathered from online game players, it is a more appropriate underpinning for the present study. Hence, achievement, social and immersion components and their underlying dimensions will be a critical component of our research model.

2.2 Game Features and their Impact on Gameplay Motivations

Although motivations for playing games has been one of the most frequently studied topics in game research, a far less explored topic is that of the design and implementation of technical game features that may either trigger or satisfy specific gamer motivations. In what follows, we outline three sets of features that are likely to trigger the three sets of motivations.

2.2.1 Connect features and Achievement motivation

Existing research found that treachery actions by other players could undermine player motivation and therefore has proposed that the establishment of positive relationships with other users may increase gameplay motivations (Mortensen et al., 2015). Furthermore, in particular competitive players have been shown to exhibit the greatest desire to connect with other players, specifically experts, in order to learn and enhance their gameplay skills (Johnson and Patel, 2014). Specifically, these insights highlight that the ability to connect with other users may be particularly important in eliciting achievement-related motivations. Indeed, findings from a study on browser games (Prostak, 2012) found that users did not find achievements alone motivating without the ability for social interactivity. Hence, given that the ability to connect with others results in greater social comparison, challenge, and competitiveness, and in turn, greater Achievement motivation, we propose that: *H1: Connect features in an online F2P mobile game lead to a higher satisfaction of a gamer's Achievement motivation.*

2.2.2 Bonding features and Social Motivation

Beyond the ability to connect with others that is likely to instigate competition, some games center on bonding rather than merely interacting. Ryan et al. (2006) in a study of Massively Multiplayer Online (MMO) games found that continuous opportunities to interact with other players led to perceptions of relatedness and enjoyment. Cole and Griffiths (2007) further highlighted that Massively Multiplayer Online Role-Playing Games (MMORPGs) provide highly socially interactive environments, which allow users to build friendships and long-term relationships. Indeed, existing experimental research highlighted that shared social spaces in multi-user games not only create perceptions of friendships but also makes gamers more likely to collaborate rather than focus on competition (Rauterberg, 2003). Therefore, given that the ability for sustained interactions leads to the formation of friendships and long-term relationships, we propose that: *H2: Bonding features in an online F2P mobile game lead to a higher satisfaction of a gamer's Social motivation.*

2.2.3 Share-in features and Immersion motivation

A critical motivation for nearly half of all people who play online games is the opportunity for escapism (Hussain and Griffiths, 2009). Escapism is a critical component of the immersion part of Yee's model. Video games are a unique form of entertainment where—through the creation of virtual worlds—the ability to create avatars allows for an increased sense of identification and inclusion (Papale, 2014). Specifically, the ability to customize one's avatar and the unique opportunity for self-expression and creativity—as a function of the share-in features of online games—is specifically likely to result in perceptions of immersion (Papale, 2014) as follows: *H3: Share-in features in an*

online F2P mobile game lead to a higher satisfaction of a gamer's Immersion motivation.

2.3 Gameplay Outcomes

As aforementioned, specific technical features of games, including connect, bonding, and share-in features, are likely to trigger specific sets of motivations, namely Achievement, Social, and Immersion. However, these sets of motivations may in turn elicit not only increased enjoyment and game play, but also greater in-game purchases. Therefore, in what follows, we outline three dependent variables that are part of our research model.

2.3.1 Perceived Enjoyment (PE)

Perceived enjoyment in the context of video games is best defined as "fun associated with playing the game" (Chou and Kimsuwan , 2013). Existing research has suggested that specifically the quantity and quality of the user network in a video game is a critical antecedent for perceived enjoyment (Marchand and Hennig-Thurau, 2013). With respect to the three sets of motivations presented above, all three appear to be drivers of perceived enjoyment. First, with respect to Achievement, existing literature has revealed that the experience of challenge increases perceived enjoyment (Holbrook et al., 1984; White, 1959; Klimmt et al., 2007). Specifically, an experimental study of the effect of perceived performance on game enjoyment found that higher perceived performance resulted in greater enjoyment (Klimmt et al., 2009a, 2009b). However, in case of very difficult games, players were found to be able to "strategically switch between different sources of fun", suggesting that other factors beyond achievement drive perceived enjoyment.

Furthermore, Griffiths et al. (2004) found that adolescent and adult gamers' enjoyment was greatest for games with social aspects. A follow-up study (Cole and Griffiths, 2007) found that a direct positive relationship exists between the ability for social interactions in online gaming and enjoyment. Therefore, beyond achievement, social interactions afforded in gameplay also affect perceived enjoyment.

Finally, using transportation theory, Green et al. (2004) show that immersion, the third component of Yee's model, can also lead to enjoyment. Transportation theory suggests that immersion in a narrative allows people to adapt their intentions and attitudes to a story and result in enjoyment (Przybylski, 2010). This position is supported by the direct link found between character identification and game enjoyment (Hefner et al., 2007). Yet, some recent research has highlighted that whereas character identification increases enjoyment, avatar/player similarities may actually undermine enjoyment (Trepte and Reinecke, 2010). Hence, it is worth exploring if specific game features are successful in triggering immersion and in turn enjoyment.

The above suggest that all three sets of motivations, Achievement, Social and Immersion, may increase perceptions of enjoyment. Hence, we propose that: *H4: The higher the perceived achievement, immersion, and social interactions, the higher the perceived enjoyment of an online F2P mobile game.*

2.3.2 Use Continuance (UC)

Since F2P games are free, revenues are dependent on in-game purchases, which in turn are contingent on player retention; i.e., the game needs to induce use continuance. Cyr et al. (2006) adapted the Technology Acceptance Model (TAM) with the hedonic concept of enjoyment in the context of mobile devices; they found that enjoyment was able to affect a user's loyalty intention towards a mobile device.

In the context of games, some preliminary evidence exists to suggest similar patterns, where perceived enjoyment drives not only on-going use (Shin, 2010), but also potentially increasing use (Wu and Liu,

2007) and gamer loyalty (Hsu and Lu, 2007). Hence, we propose that: *H5: The higher the perceived enjoyment, the higher the use continuance of an online F2P mobile game.*

2.3.3 Purchase Intention (PI)

Although use continuance is the first step towards gamer loyalty and, in turn, in-game purchases, the ultimate goal for developers of F2P games is purchase intention. In order to understand the link between gameplay motivations and purchase intention, we rely on effectance theory, which highlight that not only material factors—such as price—are critical predictors of PI, but psychological aspects are equally important, especially pleasure or enjoyment (Chou and Kimsuwan, 2013; Guo and Barnes, 2009; Prostak, 2010). Hence, finally we propose that: *H6: The higher the perceived enjoyment, the higher the purchase intention within an online F2P mobile game.*

2.4 Proposed Research Model

Our proposed research model regarding the relations between game features, player motivation, and three gameplay outcomes—perceived enjoyment, use continuance, and purchase intention—is shown in Figure 1 below.

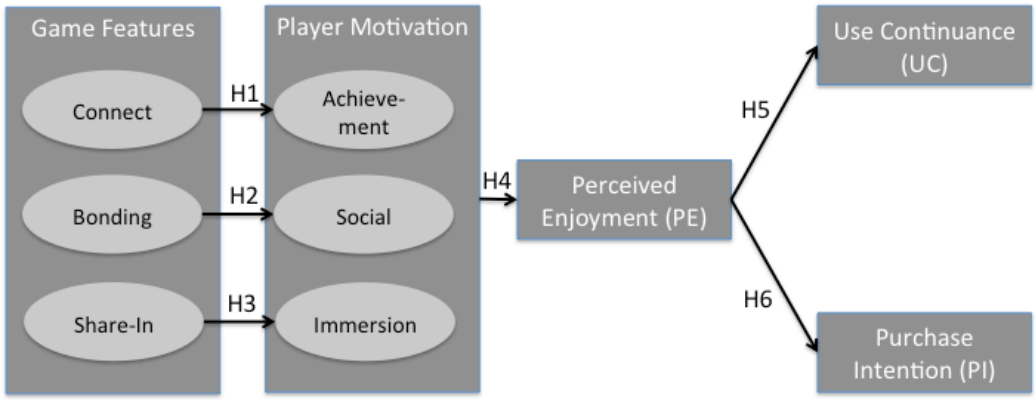

Figure 1. Proposed Research Model

3 Research Design

A three-group, scenario-based study was conducted via an online survey. Participants were randomly assigned to one of the three groups and presented with the following. Scenarios provided a general overview of the F2P smartphone and table game, and then varied only in the game features available in each of them; specifically, a scenario was adapted to include either the « connect », « bonding » or « share-in » features. Scenarios were developed based on a literature review and validated through a manipulation check involving five participants. These participants were presented with a short definition of « connect », « bonding » and « share-in » features and then with the three sets of features. For each set, they were asked to indicate if they perceived them as « connect », « bonding » or « share-in » features, or if it was unclear. The manipulation check was confirmed as 100% of the respondents were able to identify the « connect » and «share-in » sets of features as such, while 80% of them matched the « bonding » set of features to the corresponding definition. For the actual study, after participants had been presented with their randomly assigned scenario, they were asked to respond to questions pertaining to the research model constructs of gaming motivations, perceived enjoyment, use continuance and purchase intention.

3.1 Screening and Sampling

Participants were screened for current use of smartphone and/or tablets, as well as prior experience with mobile games, so as to ensure as an appropriate sample considering the study context (i.e., online F2P mobile games). Given that the study involved three groups, and that the most complex construct contained six questions, a minimum sample of 180 participants was required. After cleaning the 404 responses for incomplete submissions and outliers based on two standard deviations from the mean, 202 usable responses remained thereby satisfying the sampling size requirement. The study sample is described in Table 1.

Item	Answer (% of total)
Gender	Male (30.3); Female (69.7)
Age	<18 (10.1); 18-24 (58.1); 25-34 (27.3); >35 (4.5)
Origin	Europe (48.5; 33% from France); N.America (35.6; 31% from U.S.); S. America (2.5); Asia + Oceania (13.4)
Residence	Europe (48.7; 31.5% from France); N.America (38.1; 31.5% from U.S.); S. America (2.1); Asia + Oceania (10.6); Africa (0.5)
Game play	Smartphone (52.5); Tablet (8.4); Both (39.1)
Number of games	1 (21.5); 2 (30.8); 3 (21.5); 4 (7.7); 5 (12.3); 6+ (6.3; 3.9% had 10+)
Gaming frequency	Almost never (15.3); 1-3 days/mth (11.4); 1 day/wk (9.9); 2-5 days/wk (15.3) Daily or nearly daily (48.1)

Table 1. Demographics of the Sample

3.2 Measurement and Analysis

The online survey was made available in both English and French; the questionnaire was translated to French and then back-translated to English to ensure accuracy. A snowball, convenience sample was recruited, with an initially invited audience of graduate students in a private European Management School.

After the two screening questions described above, participants responded to six questions regarding demographics (i.e., gender, age, country of residence, country of origin, gaming frequency, number of games installed on their device). Then, measurement of study constructs was conducted through the use of previously validated scales, as follows: three gaming motivations in Achievement, Social, and Immersion (Yee, 2006), respectively measured through 5-point Likert scales (note: Yee, 2006, found that 5-points worked better than 7-points for uni-polar scales). Seven-point Likert scales were used for the remaining and previously validated scales of Perceived Enjoyment (PE – Davis et al. 1992; Hong and Tam, 2006), Use Continuance (UC – Davis, 1989) and Purchase Intention (PI – Chou and Kimsuwan, 2013; Pennington et al., 2003); anchors used were « Very unlikely » to « Very likely » for PE and UC, and « Strongly disagree » to « Strongly agree » for PU. Further empirical validation of these scales need to be conducted using confirmatory factor analysis in future iterations of this work. Data were cleaned and analyzed in SPSS through both regression and ANOVA analyses as a preliminary analysis to future analyses using structural equation modelling.

4 Preliminary Findings

To explore our initial hypotheses regarding the effects of the game features on specific sets of motivations, we used one-way analyses of variance. Our exploratory results show that: connect vis-à-vis bonding has a significantly greater impact on Achievement motivation (mean difference = .356, p = .010), however, there is no significant difference with a share-in feature (mean difference = .142, p =

.692), offering partial evidence in support of H1. Furthermore, bonding vis-à-vis connect and share-in features has a significantly greater impact on Social motivation (mean differences = .746 and .628; p =.000), providing full support of H2. Finally, share-in features vis-à-vis both connect and bonding features has a significantly greater impact on Immersion motivation (mean differences = .681 and .730; p = .000), offering strong evidence in support of H3.

To explore the impact of motivations on perceived enjoyment, a multiple linear regression model was ran and revealed that all three sets of motivations; achievement, social, and immersion, significantly affect perceived enjoyment (B = .379, .318; .504; and p = .003; .001, .000); offering strong evidence in support of H4. Finally, to explore the impact of perceived enjoyment on use continuance and purchase intention, we ran a linear regression model, which revealed that PE significantly predicts both use continuance (B=.753; p = .000; adjusted R2 = .569) and purchase intention (B=.539; p = .000; adjusted R2 = .263).

5 Discussion

This research-in-progress paper set out to extend existing research on the impact of user motivations on enjoyment and use continuance, by further exploring the impacts of a set of game features—connect, bonding, and share-in—as triggers for gameplay motivations as well as the impact of perceived enjoyment on in-game purchase intention, specifically important in the face of the proliferation of online F2P mobile games. Findings provided initial strong evidence in support of all hypotheses, with the exception of hypothesis 1 (partially supported), highlighting that game features can be designed and developed to trigger certain types of motivations; specifically so that connecting with other users leads to greater achievement motivation, bonding leads to greater social motivation, and share-in results in greater immersion experiences. Furthermore, we found that all three sets of motivation significantly predict perceived enjoyment, which in turn positively affects gamer loyalty—i.e., use continuance—as well as in-game purchase intent. Future iterations of this study will use a structural equation modelling approach for a more accurate and holistic assessment of our proposed research model.

From a theoretical perspective, the present study helps to extend existing game research that has largely focused on the relationship between motivations and perceived enjoyment, by showing that specific game features can be designed and developed in order to elicit specific sets of motivations. Hence, this study contributes to a fairly unexplored area of ludology, namely features of online F2P mobile games and their impacts on gamer motivation. From a practical perspective, showing that specific game features elicit specific motivations, which in turn drive enjoyment, gamer loyalty, and purchase intention for micro-transactions within the game can help game companies allocate their design and development resources in the most productive fashion. Our findings showed that the Immersion motivation is the strongest predictor of perceived enjoyment; hence, designing the share-in features as part of a F2P game is the most critical antecedent to gamer loyalty and purchase intention.

Although we highlight the critical importance of the share-in features, future research could provide a more in-depth exploration of various share-in features (e.g., avatar customization) to see which ones perform best in isolation or whether an additive effect exist. Also, since previous studies have shown that certain type of avatar features enhance immersion while others undermine immersion, future research should explore if immersion has a linear or an inverted parabolic effect on perceived enjoyment (Trepte and Reinecke, 2010). For instance, the recent surge in popularity of Pokémon Go has also highlighted dangers of too much immersion—e.g., near robberies and kidnaps (Yahoo News, 2016), which could discourage a user to continue playing a game. Lastly, we looked at perceived enjoyment as a mediator in the relationship between motivations, on the one hand, and use continuance and purchase intention, on the other hand; future research should also explore a direct effect of gamer loyalty (i.e., use continuance) on purchase intention, as it would seem logical to assume that more loyal game players of a particular F2P game are more likely to complete in-game purchases.

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