Freemium Mobile Gaming: Exploring the Missing Link between Playing a 'Free' Mobile Game and Paying for its Premium Version

1. Introduction

Mobile gaming is a relatively new form of entertainment that has come into prominence over the last ten years (Ravoniarison & Benito, 2019). Although it was initially adopted by young, male consumers, more recently it has become increasingly popular with individuals from all socio-demographic segments of society. In 2019, the population of mobile gamers was split equally between men and women, with an average age of 36.3 years, up from 27.7 five years earlier (Kaplan, 2019). Due to its profound transformation, the mobile gaming industry is now deemed as the world's fastest-growing app category (Statista, 2019) and holds a 45% share in the global video games market (Wijman, 2019) with a third of the global population (2.4 billion) playing mobile games regularly (Cabras et al, 2017; Kaplan, 2019) bringing $68.5 billion in revenue (Wijman, 2019). When mobile games were first introduced to the market, most providers offered them to consumers on a pay-to-play basis, but most providers quickly adopted the "freemium" model (Ramirez, 2015), whereby mobile games are offered for free to consumers (free-to-play, F2P), who are then nudged towards in-app purchases in order to unlock extra features, continue playing the game beyond a specific level, or eliminate the presence of advertisements (Sifa et al., 2015). Remarkably, in 2019, free-to-play spending accounted for 80% of all digital games revenue, according to a Nielsen report (Superdata, 2020)

Due to their immense popularity and business appeal, mobile games have been the subject of substantial academic research across several scientific fields (Kumar et al., 2017; Merikivi, Tuunainen & Nguyen, 2017). Most of this research, however, does not distinguish between pay-to-play and freemium mobile games and only a few take into consideration the substantial differences between the two models (Balakrishnan & Griffiths, 2018). From a business perspective, there is a significant difference in the pricing strategy and revenue model of freemium games compared to pay-to-play (Koeder & Tanaka, 2017). Business executives need to continuously perform a balancing act between offering game features under the 'free' or 'premium' (i.e. pay) model. On one hand, the strategy of incorporating more free elements makes mobile games more attractive to users, alleviates consumers' fears of spending their money on the wrong game (Martin, 2011), and motivates them into adopting this type of

entertainment (Heier, 2016). On the other hand, providing fewer free elements entices users with opportunities to receive additional premium content, such as avatar cosmetic upgrades and power-ups to distinguish themselves from free players (Liu, Au & Choi, 2014; Chou & Kimsuwan, 2013).

The freemium model also offers significant changes in consumer experience. For instance, as mobile games are hedonic entertainment offerings, the absence of any initial cost for consumers significantly increases the intrinsic value of the games, a phenomenon called the *zero-price model* (Niemand, Mai & Kraus, 2019). This intrinsic value may be derived from the increased popularity of freemium games or their potential virality, which, among other things, allows gamers to participate in a socially and culturally influential activity (Rokošný, 2018). Furthermore, the freemium model enables customisation of experience based on consumers' available budget, time and effort, and is more likely to lead to increased revenue from in-app purchases due to gamer stickiness and addiction (Gainsbury et al., 2016). Finally, the freemium model has ethical implications for consumers. Instead of investing in interesting plot or graphics, many mobile designers use the freemium model to lure players and then create a compulsive addiction to the game using psychological traps (e.g. the sunk-cost fallacy) (Heimo et al., 2018).

In this paper, we attempt to examine mobile gaming adoption by consumers taking the unique characteristics of the freemium model into account. In doing so, we explore the economic, psychological, and emotional trade-offs associated with freemium games and attempt to answer why only 5% of freemium game consumers make in-app purchases (Appsflyer, 2016). Seeking to shed light on this relatively unexplored, but popular, consumer activity, our research aims are to: a) explore the factors that determine the adoption of freemium mobile gaming as a form of entertainment and b) identify the conditions under which the gap between intending to play freemium mobile games and making in-game purchases is created. Answering these has important theoretical contributions for both marketing and ICT scholars, as well as for industry leaders interested in increasing revenue and delivering mobile games that enhance consumer experience in a responsible way.

In the following section we review the existing literature that led to the development of our research hypotheses and conceptual framework. Then we outline the primary research methods used to test the validity of our framework, followed by analysis of the collected data. In the

final section we present our main conclusions, along with a discussion on the theoretical contribution of our research and implications for academics and practitioners.

2. Literature Review

2.1 "Freemium" mobile games

In the last decade, new technologies in mobile phones and drastic changes in individuals' lifestyles have allowed the mobile gaming industry to flourish (Kumar et al., 2017). Initially targeting young and male audiences, mobile games have become a multibillion-dollar industry, offering opportunities for every smart-phone user to become a gamer (Ravoniarison & Benito, 2019). Compared to complicated, usually expensive, 'hardcore' video games, mobile games are usually characterised as 'casual' games (Merikivi, Tuunainen & Nguyen, 2017) designed for momentary entertainment. Therefore, not many users are interested in investing large sums of money to obtain them, especially given the fact that most mobile game users will quit a game less than a day after download (Johnson, 2014). In this setting, the "freemium" (an amalgamation of "free" and "premium") model has emerged as the dominant business model among smartphone apps (Kumar, 2014). The premise of this pricing strategy is that consumers get a version of the product for free and can chose to pay extra for two main reasons: a) to have access to a more advanced, ad-free version of the game; or b) for in-app purchases, usually for small amounts of money, that offer various in-game items and updates, such as enhancing their characters' appearance and ability. The benefit of the freemium model for consumers is that they can test the game with no financial risk and sample the product before making a decision to invest in the game (Deng et al., 2020). Developers benefit from brand building (Bawa & Shoemaker, 2004), increased intention to use the software (Lee & Tan, 2014), a greater number of downloads (Liu, Au & Choi, 2014), and acceleration of market diffusion (Jiang & Sarkar, 2010).

Freemium games offer a win-win approach for users and game publishers and have seen substantial popularity and commercial success, leading to a "gold rush" (Alha et al., 2016:1) of attempts to transform traditional 'pay to play' games into the freemium model. Mobile game developers may still make a profit with the free model, via in-game advertising. However, the main premise of the freemium model is to create more paying customers. Previous literature has explored how specific characteristics affect the likelihood of users paying. These include game features such as service quality (Hamari et al., 2017), elements of gambling (Koeder &

Tanaka, 2017), type of game (social versus solitary) (Ryan et al., 2016), as well as users' characteristics such as their vanity (Geng & Chen, 2019) and impatience (Evans, 2015).
However, while a plethora of studies have explored individual features that lead to users' willingness to pay, there is no empirical evidence to show how different characteristics may interact together. For example, one dilemma shared by freemium mobile game designers is how much of the 'good' aspects of a game to give for free and how aggressive the efforts to monetize should be. If monetization attempts are perceived as too aggressive, or if the pricing model is seen as unfair, players might feel alienated and abandon a game for others (Hamari et al, 2017). However, if too much of a game is given for free, users will have little reason to invest in paying for it. In an attempt to explore the process of monetizing freemium mobile gaming more holistically, we employ the theoretical lens of the Technology Acceptance Model (TAM) to examine how issues such as perceived ease of use, fun and convenience eventually lead to intention to pay for a mobile game. We also explore how user-specific and context-specific factors may play a role in in the decision to pay for a freemium mobile game.

2.2 Technology Acceptance Model

Since it was first introduced (Davis, 1989; Davis et al., 1989), the Technology Acceptance Model (TAM) has been used to explain the adoption of software innovation in numerous industries, such as hospitality (Kim, Lee & Law, 2008), agriculture (Flett et al., 2004), healthcare (Pai & Huang, 2011) and many others. The main idea behind the model is that purchase intention for an innovative technological product or service can be predicted based on two main variables: *Perceived Ease of Use*, which refers to *"the degree to which a person believes that using a particular system would be free of effort"* (Davis, 1989: 320) and *Perceived Usefulness*, namely *"the degree to which a person believes that using a particular system would enhance his or her job performance"* (Davis, 1989: 320). Both variables have been shown to have a positive direct influence on behavioral intention, as well a positive indirect influence through the improvement of users' attitudes towards the innovation (Mathieson, 1991). Later adaptations of TAM have incorporated various additional predicting factors, the most prominent of which concerns the influence from one's social environment (Venkatesh & Davis, 2000; Chen & Chen, 2011).

Given its popularity among academics, it comes as no surprise that TAM has been also used extensively to predict behavioural intention of mobile technology usage (Pagani, 2004; López-

Nicolás et al., 2008; Ooi & Tan, 2016; Verma & Sinha, 2018; Stal & Paliwoda-Pękosz, 2019), as well as to explain traditional online gaming adoption (Hsu & Lu, 2007; Ha, Yoon, & Choi, 2007). Regarding the latter, social norms and flow experience have been identified as the most crucial predictors of adoption (Hsu & Lu, 2007). Similar results have been reported from studies (albeit rather limited) exploring the adoption of mobile gaming. Specifically, factors related to user experience such as game features, enjoyment and network opportunities, have been found to determine the full adoption of mobile gaming by potential users (Wei & Lu, 2014). Although some of these factors resemble the variables used in TAM, to our knowledge, very few studies exist to directly apply the TAM model to the specific case of mobile games and none of them on freemium mobile games. The most comprehensive effort so far is perhaps Okazaki et al.'s (2008) study, where they modified TAM by replacing perceived usefulness with perceived convenience and perceived fun, as these two new variables resonated better with the core benefits of mobile gaming. In the development of the research hypotheses that form our study's conceptual framework, we follow a similar approach and also incorporate the distinction between *intention to play* and *intention to pay*, which we consider an important addition when researching freemium mobile games.

2.3 Research hypotheses

2.3.1 Perceived fun and perceived convenience

Perceived usefulness is one of the two main determinants of users' attitudes towards a specific technological innovation (Davis et al., 1989). However, according to the relevant literature, the original perceived-usefulness dimension of TAM is better suited for computer software due to non-ownership, compared to TBSS (Dabholkar & Bagozzi, 2002), which relates better to performance that represents customer satisfaction, comprising of service reliability and accuracy (Meuter et al., 2000). Mobile games are neither relevant to reliability nor ownership, rather they reflect "it fits my life" dimension, as they are mostly hedonic and definitely not utilitarian products (Liu & Li, 2011). Therefore, using perceived usefulness to predict users' attitudes becomes less relevant. To address this issue, Okazaki et al. (2008) replaced perceived usefulness with two new variables, namely "perceived convenience" and "perceived fun", which are both more relevant to the mobile gaming context and, at the same time, effectively capture the essence of perceived usefulness as a predictor.

Positive emotions, such as excitement, gratification, and pleasure are the most important motives for playing mobile games (Okazaki et al., 2008). People play games to fulfill their fantasies and desires, escape from reality, and distract themselves from unsatisfied life situations (Henning & Vorderer, 2001). All such positive emotions can be effectively encapsulated by the concept of *fun* and potential users' perceptions of it. At the same time, mobile game users also draw satisfaction and form attitudes based on the technical characteristics of games that increase their enjoyment of playing the game, such as design simplicity, technological functionality and usage practicality (Okazaki et al., 2008). These characteristics can be described conceptually by the notion of *perceived convenience*.

Attitude represents an emotional response to show the degree to which an individual likes or dislikes something (Ajzen & Fishbein, 1980) and is usually classified into two categories: attitude towards an object or attitude towards a behaviour (Fishbein & Ajzen, 1975). Attitude is also regarded as an overview evaluation of both positive and negative components given a stimulus (Priester & Petty, 1996). In this research we hypothesize that the perceived fun and the perceived convenience users experience during mobile gameplay stimulates attitude, that subsequently influences the antecedent of intention to play mobile games. This leads to the following hypotheses:

H1: *Perceived fun positively influences attitude towards freemium mobile games.*

H2: *Perceived convenience positively influences attitudes towards freemium mobile games.*

2.3.2 Perceived ease of use

The influence of ease of use on consumers' attitude towards using a specific technology is well established in the literature (Davis et al., 1989). When individuals consider a technology to be accessible and compatible with their skills and experience, they are more likely to develop favourable opinions about it and are more likely to adopt it (Venkatesh & Davis, 2000). Although this relationship seems self-evident, previous studies of video games have reported inconsistent results (Wang & Goh, 2017). Brumer and Kumar (2005), for example, did not find this relationship significant in the context of mobile internet usage. At the same time, many authors have proposed that apart from the direct influence of ease of use on attitudes, an additional indirect impact exists via the improvement of perceived usefulness (Marangunić & Granić, 2015; Scherer, Siddiq & Tondeur, 2019). By contrast, in the context of mobile gaming, Chen et al. (2017) found the direct influence on attitudes significant and the indirect

one not significant. The case is even stronger for freemium games, where if, for example, enjoyment of the game is purposefully degraded by artificial 'gaps' in order to sell more virtual products, players might feel alienated (Hamari et al., 2017). In order to shed light on these inconsistent results, in this study we explore the influence ease of use has on attitudes both directly and indirectly, based on the improvement of consumers' perceptions of both the utilitarian and hedonic aspects of mobile gaming, i.e. fun and convenience respectively. On this basis, we formulate the following research hypotheses:

H3: *Perceived ease of use positively influences attitudes towards freemium mobile games.*

H4: *Perceived ease of use positively influences perceived fun in freemium mobile games.*

H5: *Perceived ease of use positively influences perceived convenience in freemium mobile games.*

2.3.2 Intention to play

The relationship between attitudes and behavioural intention is one of the most established in the literature (Bagozzi, 1981; Dabholkar & Bagozzi, 2002; Bruner & Kumar, 2005). In the context of mobile gaming, it has been shown that in order for an individual to adopt this type of entertainment, a positive attitude towards it is a prerequisite (Liu & Li, 2011). Nevertheless, as the gaming market has continued to evolve, consumers' game purchasing preferences and behaviours have changed. Initially, games were mostly designed for computers or consoles, and a tangible copy or a license needed to be purchased in order for someone to be able to play the game. This is known as the traditional pay-to-play model (Alomari, Soomro & Shaalan, 2016). For such games, the relationship between attitudes and purchase intention is self-evident and straightforward (Chen et al., 2017). Hence, we hypothesize:

H6: *Attitudes towards mobile games positively influences consumers' intention to play freemium mobile games.*

Due to the competitive nature of the mobile gaming market, many times users refrain from purchasing newly launched games, even if their attitude towards them are positive (Martin, 2011). In fact, this is one of the main reasons why the freemium model was conceived, as an alternative to the pay-to-play model. The freemium model, albeit effective in motivating more potential users to start playing mobile games, makes the relationship between attitudes towards

mobile gaming and actual purchase intention more complicated. This is because for freemium mobile games there are two interrelated, but distinct, behavioural intentions: the intention to play such games, and the intention to pay for continuing to play them (Souza & Freitas, 2017).

Although mobile game developers may make a profit with the free model as well as the pay model (e.g. via in-game advertising), the main premise of the freemium model is to draw in more paying customers and, therefore, increase income. Hence, the link between users' willingness to try a 'free' mobile game and their willingness to pay for it is crucial. This is of particular importance given the extremely low conversion rate from playing to paying customers. According to a market research firm (reported in Johnson, 2014), only 2.2% of all mobile game users pay for optional items. Marketing scholars have suggested that giving free samples to consumers may have both positive and negative effects: trying something for free can lead to purchases by consumers who would not normally buy the product (expansion effect), or may lead to sales earlier than before (acceleration effect); however free samples can also reduce the volume of paid purchases (cannibalization effect) (Bawa & Shoemaker, 2004). We argue that in the context of mobile gaming, the cannibalization effect should be less of a concern to developers and that the intention to play a freemium game will positively affect intention to pay for it. This is due to the large number of freemium games available, all with a relatively low degree of heterogeneity, which suggests that a freemium game will more likely cannibalize the free substitutes and not the paid version of the game (Liu, Au & Choi, 2014). Hence, we posit:

H7: *Intention to pay for freemium mobile games is positively influenced by users' intention to play.*

Although the relationship between the two intentions has intuitive appeal, in order for users to fully adopt the freemium model and pay for games, an intention to play is not sufficient. As recent research has demonstrated, there is an additional factor that needs to be taken into consideration, relating to users' perceptions of the economic value of the game (Hamari, Hanner & Koivisto, 2020). Perceived economic value embodies the perceived affordability of users' willingness to devote time and money by assuming a justifiable financial expenditure through traditional cost-benefit evaluation (Mathwick et al., 2001). Even for free games, users still download and play them using mobile data that may sometimes be costly - a sacrifice they may be willing to make only if they have a positive attitude towards the game. However, when users are nudged to pay to continue to play a game or to unlock new features, their perception

of the value received by buying the game will also be a major determinant (Hamari, Hanner & Koivisto, 2020). Park and Lee (2011) found that perceived good value of an in-game item was based on its enjoyment, competency, status and monetary value, and led to increased purchase intention of that item.

On this basis, we hypothesize:

H8: *Intention to pay for freemium mobile games is positively influenced by users' perceived economic value.*

Finally, research on online and mobile gaming has indicated that individuals with a tendency to get stuck – or, in extreme cases, even addicted to gaming - are more likely to pay for premium features in order to continue to play (Gainsbury et al., 2016). As Soroush, Hancock, and Bohns (2014) report, gamers (in this case, of Candy Crush Saga) with low self-control, tended to feel the need to continue playing the game and, therefore, spent more on in-game purchases than other players. In fact, they sometimes paid for premium features (e.g. extra lives), even though they could wait for a few minutes to get these features for free. Recent research has described this tendency under the notion of loyalty towards mobile games, and this has been shown to be a significant predictor of in-game purchase intention (Balakrishnan & Griffiths, 2018). On this basis, we formulate the following hypothesis:

H9: *Intention to pay for freemium mobile games is positively influenced by users' loyalty towards mobile games.*

Insert Figure 1

3. Methodology

3.1 Sampling and Data Collection

In order to test the validity of our conceptual framework, we followed a deductive approach and conducted a primary quantitative study using a structured questionnaire. To test our hypotheses across different cultures and increase the generalizability of our findings, we surveyed potential users of freemium mobile games in the UK and Singapore. We selected those two countries because they have a similar level of adoption of ICTs but have different cultural and social values. We aimed to collect more than 300 responses for two reasons: a) to

enable the credible use of Structural Equation Modelling (SEM) in the statistical analysis of the data, and b) to increase the validity of the results, as suggested in previous studies (Fan, Thompson & Wang, 1999). We used a convenience sampling method, with a sampling frame comprising approximately 800 participants active in social media groups related to gaming. To collect our data, we contacted all users via email with a request to participate in the study. Out of the 800 participants, 252 agreed to participate and completed the questionnaire. A second participation request was sent two weeks later to the non-responders and an additional 53 responses were collected. Therefore, our final sample consisted of 295 participants (145 in the UK and 150 in Singapore), a response rate of 36.9%. We compared all variables between the two countries and no statistical differences were found. Similarly, no differences were found between early (first wave) and late (second wave) respondents, indicating that there is no evidence of non-response bias.

3.2 Operationalization of Variables

In our survey we used previously developed and validated scales to capture all constructs of our conceptual framework. Specifically, to measure *perceived fun, perceived convenience* and *perceived economic value* we adapted three 4-item scales developed by Mathwick et al. *(2001),* while a 4-item scale developed by Dholakia and Baggozi (2002) was employed to measure *perceived ease of use.* For the measurement of *attitude towards mobile games* and *play intention* we used 3-item scales adapted by Huang et al. (2003), whereas we used a 2-item scale adapted by Hsiao and Chen (2016) to assess *pay intention*. Finally, an adaptation of the two-item scale from Balakrishnan and Griffiths (2018) was used to measure *loyalty towards mobile games*. All scales were Likert type, with the anchors Strongly Disagree (1) to Strongly Agree (5).

Unidimensionality and the discriminant and convergent validity of all scales were tested using confirmatory factor analysis (CFA). The results of the analyses (Table 1) indicate that all scales were unidimensional and valid (Byrne, 2012). Moreover, all scales were found to be internally consistent (reliable), as reflected by the relevant values of the Cronbach's alpha coefficients and composite reliability coefficients (CR), which were all above 0.7 (Nunnally, 1978; Fornell & Larcker, 1981). After the tests, the data were aggregated into a single measurement for each scale, by calculating the arithmetic mean of the items on each scale. Acknowledging that our data come from a single source, we then tested for high levels of common method variance

(Podsakoff et al., 2003). In doing so, we calculated all partial correlations with a conceptually irrelevant measurement (CSR scepticism), included in the questionnaire as a control variable. The results indicate that there were no significant differences between the partial correlations and the correlations without the control variable (Table 2). Therefore, we were able to safely assume that common method variance, and consequently common method bias, was not significant.

Insert Table 1

Insert Table 2

4. Results and Findings

In order to test the validity of our conceptual framework -that contains all research hypotheses- we employed Structural Equation Modelling (SEM) with the use of EQS 6.2. As shown in Table 3, the results indicate a good fit of the data with the hypothesised model (X^2=1570.05, df=290, CFI=0.91, TLI=0.90, RMSEA=0.09). Furthermore, almost all beta coefficients in the regression models were found significant apart from one. Specifically, ease of use was found to have a positive impact on perceived fan (t=18.77, p<0.05) and perceived convenience (t=8.98, p<0.05). Hypotheses H4 and H5 are hence confirmed. Regarding the antecedents of users' attitude towards freemium mobile games, the latter was found to be influenced significantly by convenience (t=4.53, p<0.05) and ease of use (t=3.98, p<0.05) but not from perceived fan (p>0.05). Therefore, hypotheses H2 and H3 are confirmed whereas H1 cannot be confirmed, although a significant positive relationship between fan and attitude is indicated by the relevant correlation coefficient. Users' attitude was found to have a significant impact of intentions to play a freemium mobile game (t=10.35, p<0.05), confirming thus H6. Finally, intention to pay was found to be significantly influenced by users' intention to play (t=6.16, p<0.05), users' loyalty towards playing games (t=7.69, p<0.05) and their perceived economic value from playing (t=4.94, p<0.05).

Insert Table 3

5. Discussion

Our study's contribution to current research is twofold. Firstly, its findings reveal the factors determining the adoption of freemium mobile games. Using technology acceptance as a theoretical lens, we conclude that intention to play such games is the direct outcome of consumers' attitudes toward playing them, which, in turn, is determined by three variables

derived from a modified TAM, namely perceived ease of use, perceived fun and perceived convenience (Davis et al., 1989; Okazaki et al., 2008). As gaming - and mobile gaming in particular - is a mostly hedonic activity (Liu & Li, 2011), when people believe they will be excited and entertained while playing, they will form better attitudes towards playing, hence it will be more likely for them to start doing so. At the same time, however, our results indicate that mobile gaming becomes more attractive as a form of entertainment when it is easily accessible and if it offers convenience to its potential users. It comes as no surprise that the most successful freemium mobile games (e.g. Candy Crush Saga, Brawl Stars) are easy to download, their gameplay is simple to learn, and they are designed to be played in all places and contexts, even extreme ones (e.g. standing in a crowd on the subway). To our knowledge, this study is the first to employ a revised TAM in the context of freemium mobile games in order to offer insight into the reasons why people adopt this entertainment activity.

The second major contribution of our study relates to the identification of factors that close the gaps between users' intention to play and their intention to make in-play purchases. Our findings suggest that apart from the expected relationship between the two (Souza & Freitas, 2017), two additional factors contribute to users' intention to pay for specific features of a game. The first is the potential economic value users perceive they will gain from a purchase. Expanding on arguments in previous research (Hamari, Hanner & Koivisto, 2020), we conclude that users may start playing a game even if they are not very excited to do so, but they will only pay for it if they believe they are actually receiving value for their money. At the same time, a second variable that acts as a bridge to gap the intention to play/ intention to pay gap is players' loyalty to playing a mobile game once they start it (Balakrishnan & Griffiths, 2018). This tendency, which can be both an individual characteristic or may be developed ad hoc based on specific circumstances, significantly increases the likelihood of in-play purchases. This is because as users become attached or even addicted to a mobile game, they want to continue playing it or unveil new features and levels, even to the point where they are ready to make small or even big financial sacrifices (Soroush, Hancock & Bohns, 2014). We argue, therefore, that the aforementioned triptych of factors (intention to play, perceived economic value and loyalty towards mobile games) offers a comprehensive explanation as to why users choose to pay for a mobile game they have already started playing.

Our study has important implications for mobile game developers and distributors. Firstly, it provides specific criteria for them to use when deciding between various distribution and pricing models (e.g. Freemium, pay-to-play, free-to-play with advertisements). Although most

business models may be suitable for providers targeting potential players who tend to prefer fun games that are easy to access and play, the freemium model seems to be preferable for users who also tend to get more fixated with playing and who consider small monetary sacrifices worth making, in order to continue to play, or in order to increase their convenience and fun. In addition, our results offer a blueprint on how mobile game providers can adopt a freemium strategy in order to increase their loyal customer base. As previous studies have shown, freemium pricing is a very effective method of customer retention in the mobile apps industry (Ross, 2018). Our results confirm this conclusion as they indicate that people who are willing to make in-app purchases have not only already developed positive attitudes and playing intentions but are also more likely to stick with playing for longer and have better perceptions on the value for money they receive from their purchases. Therefore, providers who are interested in creating loyal players may find it easier to do so through a freemium strategy. Finally, our study has important implications for policymakers. One longstanding criticism of the freemium model has been the phenomenon of whale-hunting, whereby marketers target the small group of people with addictive traits who end up paying for most of a game's revenue. Our suggestion in this paper is to focus on the convenience and fun aspects of a game and adopt a pricing strategy that makes economic sense to the most players, rather than the few. However, there are increasing calls being made for the market to be more strictly regulated, to avoid the irresponsible business practices of targeting younger adults and people with strong tendencies to become addicted to gaming.

6. Limitations and Suggestions for Future Research

The present research is not without limitations, all of which offer directions for future researchers. The first relates to this study's narrowly focused scope, namely to identify those factors that determine consumers' adoption of freemium mobile games as an entertainment activity, as well as to recognize the variables that close the gap between players' intention to play such games and their intention to make in-game purchases. Future research should go beyond users' intentions to explore the factors that influence their actual behaviour (playing, making purchases) using, for instance, the Motivation-Opportunity-Ability (MOA) framework as a theoretical lens (Siemsen, Roth & Balasubramanian, 2008). Additional antecedents and moderators could also be investigated in future studies, both to examine potential users' intention to play (e.g. social desirability, familiarity with mobile technologies) and their intention to pay (e.g. purchase power, perceived escapism).

Notwithstanding the credibility of our study, it does have some methodological limitations. Firstly, our study is cross-sectional, which accounts for why variables such as behavioural intentions and actual behaviour could not be measured simultaneously in a reliable way. Future researchers may like to consider using experimental designs and/or longitudinal studies to address this. Moreover, the findings of this research are bound to the specific cultural and national contexts of where the research was undertaken. Although our mix of a European and a South-East Asian context improves the generalizability of our findings, it would be useful to test our model in countries with different characteristics (socio-cultural factors, digital gaming habits, internet adoption etc).

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Figure 1: *Conceptual Framework*

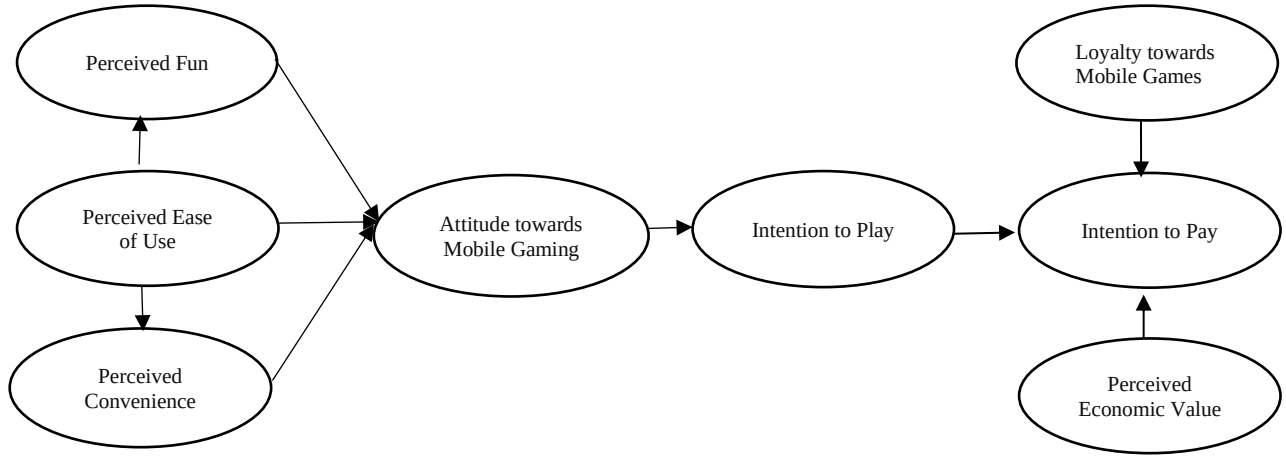

Table 1: *Descriptive statistics, validity and reliability*

Constructs	*Mean*	*St Dev*	*Skewness*	*Kurtosis*	*AVE*	*Max Correlation²*	*CR*	*Cronbach a*
Ease of Use	3.81	1.18	-0.04	-0.91	0.77	0.72	0.94	0.92
Perceived Fan	3.93	1.15	0.09	-1.06	0.77	0.72	0.93	0.93
Perceived Convenience	3.81	1.06	0.02	-0.80	0.76	0.30	0.92	0.92
Attitude	4.45	1.17	-0.23	-0.14	0.83	0.48	0.94	0.92
Intention to Play	3.85	1.25	-0.16	-0.55	0.86	0.31	0.95	0.95
Perceived Economic Value	3.55	1.38	0.57	0.02	0.89	0.25	0.97	0.97
Loyalty	3.52	1.33	0.12	-0.32	0.87	0.23	0.93	0.93
Intention to Pay	3.15	1.40	0.07	-0.85	0.88	0.30	0.93	0.95

Table 2: *Correlations and partial correlations*

Control Variable:

CSR Scepticism

	Ease of Use	Perceived Fan	Perceived Convenience	Attitude	Intention to Play	Perceived Economic Value	Loyalty	Intention to Pay
Ease of Use	1	0.84	0.49	0.67	0.24	0.27	0.10	0.32
Perceived Fan	0.85**	1	0.55	0.66	0.26	0.27	0.15	0.29
Perceived Convenience	0.49**	0.55**	1	0.54	0.32	0.26	0.26	0.28
Attitude	0.69**	0.66**	0.54**	1	0.55	0.50	0.37	0.47
Intention to Play	0.25**	0.27**	0.32**	0.56**	1	0.57	0.48	0.54
Perceived Economic Value	0.28**	0.27**	0.26**	0.50**	0.57**	1	0.40	0.50
Loyalty	0.11	0.15*	0.26**	0.37**	0.48**	0.41**	1	0.56
Intention to Pay	0.32**	0.30**	0.29**	0.47**	0.55**	0.50**	0.56**	1

** *Significant at 0.01 level*

* *Significant at 0.05 level*

Table 3: *Fit indices and regression weights for the path model*

X^2=1570.05, df=290 CFI=0.91, TLI=0.90 RMSEA=0.09

	Standardised Beta	*SE*	*T*
Ease of Use→ Perceived Fan	0.93	*0.05*	*18.77**
Ease of Use→ Perceived Convenience	0.53	0.06	8.98*
Ease of Use→ Attitude	0.66	0.16	3.98*
Perceived Fan→ Attitude	-0.06	0.15	-0.41
Perceived Convenience→Attitude	0.24	0.06	4.53*
Attitude→ Intention to Play	0.57	0.16	10.35*
Intention to Play→Intention to Pay	0.32	0.06	6.16*
Perceived Economic Value→Intention to Pay	0.25	0.05	4.94*
Loyalty→Intention to Pay	0.43	0.05	7.69*

* *Significant at 0.05 level*