

The Effect of Use, Overuse, and Appeal of Mobile Game App on Add-Ons Purchases and Players Recruitment

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ABSTRACT

Even though the mobile games industry has grown substantially over the last few years, one permanent challenge which remains is to monetize it and to continue reaching new players. Current players contribute to this aim by purchasing mobile game accessories and by recruiting players. The current work analyses how the present use of the game and its appeal contribute to these behaviors. Results with information obtained from a sample of app gamers show that using a game app can have positive effects on recruitment, a notion reinforced when the level of performance rises, while overuse of the game app may lead to a feeling of addiction or shame that reduces new player recruitment. In addition, the game's perceived appeal (experiential value, procedural justice, and prestige) are also related with investing in new products and with recruitment.

KEYWORDS

Addiction, Experiential Value, Mobile Games, Prestige, Procedural Justice, Use

1. INTRODUCTION

According to the Superdata Report (2019), the games and interactive media industry grew 13% in 2018, and games and related media earned \$119.6B. As regards the amount earned for digital games, \$61.3B corresponded to mobiles, \$35.7B to PC, and \$12.7B to consoles. As can be seen, among these platforms, the standout games are mobile games and game apps designed to be played on smartphones, tablets and other portable devices (Shchiglik et al., 2016). These mobile games have extended the fun involved in playing to any moment, place and to all kinds of segments. The ubiquitous nature of mobile devices, coupled with the relatively low prices of apps, makes almost every consumer a potential gamer (Marchand and Hennig-Thurau, 2013). Another phenomenon that contributes to the increased consumption of mobile games is the development of massively multiplayer online role playing games (MMORPGs), which allow a large number of players to access an online game environment simultaneously and to interact with one another (Badrinarayanan et al., 2014, 2015). The ever-growing popularity of MMORGs has also had a substantial impact on Internet traffic (Che and Ip, 2012).

The result is that mobile games now generate more revenue than other platforms, i.e. PCs and consoles (Newzoo, 2018). According to Apptopia (source: <https://www.alfabetajuega.com/>), the top

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five games for mobiles that generated the most revenue in 2018 were, in this order, Monster Strike, Fate/Grand Order, Pokemon GO, Candy Crush Saga, and Lords Mobile, which –with the exception of Candy Crush– did not correspond to the top five games by worldwideweb downloads: Helix Jump, Subway Surfers, PUBG Mobile, Rise Up, and Candy Crush Saga. What this does show, however, is that the free-to-play model with micro-transactions or in-App Purchases, does function very well for mobile games. Today, there are many players and many new launches and the challenge for game app designers is not just to increase the number of downloads and to attract new players (Alzahrani et al., 2017) but also to engage them in the game so that they recommend it and purchase new accessories, thereby increasing the return from each player. Yet, what is the key to getting a mobile game recommended and for existing players to recruit new ones? Why are some players likely to invest more in a game and to buy add-ons and other related products?

Prior studies have explored online gaming adoption and intention to play (Chang, 2013; Choi and Kim, 2004; Yoon et al., 2013; Park et al., 2014; Alzahrani et al., 2017), involvement in player communities (Badrinarayanan et al., 2014), and other consumption behaviours (Badrinarayanan et al., 2014, 2015). Other studies examine player characteristics (Yoon et al., 2013; Badrinarayanan et al., 2015), and game elements (Chang, 2013; Badrinarayanan et al., 2015) or interaction protocols (Abidin et al., 2007). However, the literature has thus far failed to explore in depth the diffusion of online games or the role of use and addiction in the recruitment of new players and investment in the game. The joint study of the two issues, use (and overuse) together with game design, prove vital to their success, both from the perspective of firms (who are seeking to increase the popularity of their games through players recruiting other users, as well as through volume and revenue, such as via purchase add-ons), and from the social perspective, where the aim is to ensure these players have a satisfactory experience when they play, without any harmful experiences (particularly those which may arise from overuse). The current work is pioneering in seeking to gain deeper insights into current understanding of game player purchase behaviour and, to our knowledge, is the first to explore the behaviour of mobile game users. This offers additional academic value for our research by helping to create a theoretical framework for this kind of behaviour. From the business standpoint, the importance and turnover involved in mobile games today, coupled with the anticipated growth of both, makes it necessary to study this type of player in order to design appropriate strategies.

This study aims to gain an insight into and understand how app gamers behave. More specifically, we seek to answer the following four questions:

1. How does mobile game use affect its success (measured in terms of player recruitment and the purchase of add-ons)?
2. What is the influence of player performance on said effect?
3. How does the design of the mobile game (experiential value, perceived procedural justice or game prestige) affect its success?

In this context, a quantitative study has been performed based on the information provided by 369 Spanish app gamers (most of them undergraduate students) through a questionnaire. In this study, we examine two factors that determine the intention to purchase add-ons and to recruit new players: actual use of the game and the game's appeal.

The paper makes two notable contributions to the literature by addressing the post-consumption behaviour of mobile game users and the diffusion of mobile games. First, this paper posits that the use and overuse of the game impact differently on the intention to invest in the game and to recruit new players. Mobile game designers aim to create a certain connection to the game that triggers the desire to improve, to seek fresh challenges in each new level and, in sum, to continue playing, and which is expected to lead to positive purchase behaviour toward the game. The current study shows that this positive effect is mediated by the player's performance in the game. Moreover, the player's

overuse of the game may have a negative influence on the intention to invest more in it and on the recruitment of new players.

Second, in contrast to previous literature that looks at game design, and in particular taking into account the works of Badrinarayanan et al. (2014, 2015) that focus on game features such as the challenge or telepresence, this study also examines the influence of the game's appeal. This paper considers the game's experiential value, together with other variables that have gone virtually unexplored and that might prove relevant (perceived justice and game prestige) to the investment in new products related to the game and to recruitment.

The paper is organized as follows: the second section presents a literature review on consumption behaviour of mobile games and describes the theoretical model and hypotheses. The third section presents the methodology, and the fourth section provides the empirical results. Major business implications are the subject of discussion in the final section of the article.

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. Consumption Behaviour of Mobile Games

Previous research on online gaming has focused on three areas: the determinants of gaming behaviour, the characteristics of gaming behaviour, and the consequences of the gaming experience. Table 1 sums up these areas, the theoretical bases, and the literature review.

The determinants of gaming are supported by the self-efficacy theory, the self-determination theory, the dual process theory, the uses and gratifications theory, the theory of planned behaviour, and the Internet-affected social compensation hypothesis. On these theoretical bases, gaming is associated to self-efficacy, social competence, identity, challenge, involvement, competence, loneliness, boredom, diversion, fantasy, perceived control or subjective norms, among other variables.

As for gaming behaviour, studies based on the game theory and the flow theory examine aspects such as player involvement, human-avatar interaction, immersion, flow, presence, personalization, skills or continuance intentions.

Finally, the consequences of the gaming experience have been studied from the segmentary lineage theory, the experiential consumption theory, the social identity theory, the PAD model, the general aggression model, and Internet as an addiction disorder. The experiences identified and the effects of gaming can be either positive (escapism, excitement, sense of community, identification, embeddedness, pleasure, or arousal) or negative (behavioural deviance, aggressiveness, or addiction). Within this research domain, we note a paucity of works analysing the impact of gaming behaviour on game diffusion, specifically the purchase of add-ons and new player recruitment. Based on the theory of diffusion of innovations, we therefore propose two elements that influence the intention to invest in the game and to recruit new players: current use of the game and the game's appeal.

2.2. Theoretical Bases and Research Model

Figure 1 shows the research model, which examines what impact game use and design have on its success. In order to justify the relations between these variables, which are detailed in the following sections, and the research hypotheses, we mainly draw on two theoretical bases: Internet addiction disorders (see, for example Griffiths 2000), in order to examine the effect of use-overuse on game success, and the experiential consumption theory (see, for example Badrinarayanan et al., 2014), to study the effect of the game's appeal. In addition, the model examines the effect of player performance, such that there is also a more qualitative indicator of game use, exploring its mediating effect between the prior variables and game success, which we now deal with.

Table 1. Summary of research on online gaming

Theories	Theoretical Proposal	Main Variables	Studies in the Games Context
Research Domain: Determinants of Gaming			
Self-efficacy theory	Self-efficacy refers to an individual's belief in his or her ability to organize and execute courses of action required to attain given achievements. Self-efficacy theory focuses on the interrelationships between self-efficacy, outcome expectancy, and behaviour. The determinants of self-efficacy are mastery experience (personal accomplishments), vicarious experience (efficacy information derived from comparison and observation of others), psychological states, and verbal persuasion.	Self-efficacy Mastery experience Vicarious experience Psychological states Verbal persuasion	Conmy et al. (2013) analyse the effects of trash talk and competition outcome on the self-efficacy of video players. Lee (2015) conclude that digital game interactivity predicts higher self-efficacy compared to non-interactive passive games
Internet-affected social compensation hypothesis	The positive variant of the hypothesis states that being online has an influence on the social competence of adolescents. Adolescents use the Internet for social purposes, such that the social use of the Internet gives adolescents the opportunity to practise their social skills by experimenting with their identity and by talking to a variety of people. From the negative variant, the relationship between being online and loneliness is considered positive.	Social competence Loneliness Identity	Visser et al. (2013) hypothesize that adolescents who play videogames (MMORPG) experiment with their identity, enhance their social competence, and reduce feelings of loneliness.
Dual process theory	Cognitions and emotions jointly explain consumer choice and decision making.	Challenge Cognitive involvement Affective involvement Commitment	Badrinarayanan et al. (2014) Videogames (MMORPGs)
Self-determination theory	This theory posits that psychological well-being is related to satisfying three basic intrinsic needs: autonomy, competence and relatedness.	Intrinsic needs Autonomy Competence Identity Personalization Self-discrepancy Empathy	Reinecke et al. (2012) analyse the influence of the intrinsic needs for competence and autonomy on selective exposure to video games and test the influence of satisfying these needs on resulting mood repair. The video game played was Lock-On: Modern Air Combat, a flight simulator. Turkay and Kinzer (2014) examine the effects of avatar-based customization on players' identification with and empathy towards their characters in a massively multiplayer online game; Lord of the Rings Online.
Uses and gratifications theory	The uses and gratifications paradigm proposes that basic needs, individual differences, and contextual societal factors combine to result in a variety of perceived problems and motivations for which gratifications are sought from the media and elsewhere, leading to differential patterns of media effects on both individual and societal levels. There are several gratifications associated to game playing (enjoyment, companionship, escapism, achievement, social interaction, competition, etc.). Individuals who search for these gratifications can exhibit a tendency towards addiction.	Arousal Challenge Competition Diversion Fantasy Social Interaction Addiction Loneliness Leisure boredom Self-control	Wu et al. (2010) analyse players' multiple gratifications for playing (i.e. achievement, enjoyment and social interaction) and their experience with the service mechanisms offered after they had played an online game. Li et al. (2015) identify three types of gratification that affect an individual's continuance intention to use a social network game: hedonic gratification (enjoyment, fantasy and escapism), utilitarian gratification (achievement) and social gratification (social interaction and social presence). Chen and Leung (2016) , for the case of Candy Crush Saga, explore the relationships between psychological factors (i.e., gratification, loneliness, leisure boredom, and self-control) and mobile social game addiction.
Theory of planned behaviour (TPB)	According to the theory of planned behaviour, prediction of intention depends on three different processes: attitude, subjective norm, and perceived behaviour control.	Attitude Perceived control Subjective norms	Lee and Tsai (2010) , based on the TPB, explain people's behavioural intention to play online games.
Research Domain: Gaming Behaviour			
Game theory	It identifies two characteristics as critical components of highly engaging games (Sweetser & Wyeth, 2005): the absence of predictability (the game's ability to generate surprise) and the presence of flow (the game's ability to create an experience where the player loses track of time).	Player involvement Human-avatar interactions Involvement dimensions	Norris et al. (2014) investigate the effect of using an established system for rating behavioural cues in the involvement in human-avatar interactions. The experimental context is the simulation game DRAMA-RAMA™

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Table 1. Continued

Theories	Theoretical Proposal	Main Variables	Studies in the Games Context
Flow theory	The concept of flow or flow experience has been proposed as being essential vis-à-vis understanding navigation experiences in online environments. Past information technology research suggests that continuance intention is affected by user satisfaction and flow experience.	Perception of appeal Immersion Presence Enjoyment Playfulness Flow Personalization Past experience Perceived gaming skills Repurchase intentions Playing time Continuance intention	Weibel et al. (2008) studied how the type of opponent influences playing experiences: participants who played against a human-controlled opponent reported more experiences of presence, flow, and enjoyment. Kwak et al. (2010) explored the effect of personalization on sports video games enjoyment, repurchase intention, and consumption level. Chang (2013) found that flow experience mediates the effect of interaction and user value in predicting social network game continuance. Christou (2014) found that immersion and appeal are constituents of the player experience (in the context of a first-person shooter and a massively multi-player online role-playing game) Shin (2017) investigates how players' experiences of immersion influence their satisfaction with and attitude toward augmented reality games.
Research Domain: Gaming Experience and Consequences			
Segmentary lineage theory	It posits that tribes are organized more by threat than by political or social structure. Therefore, the behaviour of highly brand allegiant consumers (Badrinarayanan et al., 2014, applied it to MMORPG community members) may be similar to tribal behaviour in primitive tribes (kinship, social structure, sense of community, or ethnocentrism).	Tribalism Segmentary lineage Social structure Sense of community Defence of the tribe	Badrinarayanan et al. (2014) propose that the brand tribalism (defence of the tribe, lineage, and sense of community) associated with MMORPGs is positively related with purchase intention, recruitment, and WOM communication.
Experiential consumption theory	Consumer participation in valued experiences generates favourable responses toward outcomes associated with such experiences. Consumers find value in "thoughts" whether they be dreams, imaginings, fantasy, feelings, expressions, and/or physical responses, as actions and reactions (prominent in MMORPG, according to Badrinarayanan et al., 2014).	Experiential consumption Escapism Aesthetic appreciation Involvement Excitement Novelty	Badrinarayanan et al. (2014) propose that the challenge of playing, telepresence, and the cognitive and affective involvement relate positively to the brand tribalism associated to MMORPGs. Kuo et al. (2016) investigate active escapism (fantasy and role-play) versus passive escapism (where consumers act as observers). In the context of video game consumption, they find that active escapism functions as a coping mechanism when consumers are confronted with external stressors. Active escapism provides the benefits of affirmation and empowerment through projective fantasy and immersion into a mediated reality.
Social identity theory	Social identity theory posits that individuals define their self-concept through associations with social referents. Therefore, identification emerges as the perception of oneness or belongingness to a social referent.	Identification Involvement Embeddedness Game elements Consumption behaviours	Badrinarayanan et al. (2015) examine the antecedents and consumption-related outcomes of player identification with MMORPGs and with the MMORPG community.
General aggression model	Social cognitive framework intended to model the paths by which exposure to violent media influences aggressive thoughts and feelings. Specific thoughts, feelings, and actions practised in video games can generalize to real-world contexts.	Sensation seeking Behavioural deviance Aggressiveness	Hull et al. (2014) propose that games can alter self-perceptions of personal characteristics, attitudes, and values with wide-ranging consequences for behaviour (alcohol use, cigarette smoking, aggression, delinquency, and risky sex) as a consequence of its effects on personality, attitudes, and affiliations indicative of increased tolerance of deviance. Przybylski et al. (2014) tested the degree to which the interactive elements of games serve to impede players' fundamental psychological need for competence gaming and are related to aggression. They find that, regardless of the presence or absence of violent game content, player perceived competence was positively related to gaming motivation, while gaming motivation was negatively associated with player aggression.
Pleasure–arousal–dominance model	The PAD model is based on the stimuli–organism–response (S-O-R) paradigm and assumes that stimuli affect the three main emotions of individuals: pleasure (mood state), arousal (degree of excitement), and dominance (extent to which a person feels they can control events rather than be controlled by them).	Experience Pleasure Arousal Dominance	Huang et al. (2017) investigate how three types of experiences (functional, hedonic, and social) influence WOM.

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Table 1. Continued

Theories	Theoretical Proposal	Main Variables	Studies in the Games Context
Internet addiction disorders	Griffiths (2000) identifies addictions associated to human-machine interaction, which can either be passive (e.g., television) or active (e.g., computer games). These technological addictions feature the core components of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse.	Addiction Social game usage patterns Online gaming motivation Gaming time	Hussain et al. (2015) , conclude that online gaming addiction is not a dichotomous construct, but a continuum that ranges from low to intermediate and then to high risk of addiction. For the case of MMORPGs, they find five classes of gaming addiction: (1) high risk of addiction, (2) time-affected, (3) intermediate risk of addiction, (4) emotional control, and (5) low risk of addiction classes.

2.3. Game Success: Intention to Purchase Add-Ons, and Recruitment

How can the success of a game be gauged? In order to measure this indicator, from a quantitative standpoint, studies tend to resort to the number of players or downloads when referring to game apps. Nevertheless, the most downloaded games are not necessarily those that generate most revenue. One example is the case of Angry Birds. According to a study published by App Annie (2016) of the most downloaded applications and games and those that yielded the greatest profit for App Store between July 2010 and July 2015, the Rovio Entertainment game is third in terms of the number of downloads but not in terms of revenue generated (in fact, it is not even in the top ten most profitable games).

There are various ways of monetizing an app, ranging from payment for downloading to revenue generated by in-app advertising, to name but two. The game apps which generate most revenue tend to be free downloads, with the revenue deriving from payment for accessing add-ons. Such is the case of Supercell's four standout games (Clash of Clans, Hay Day, Boom Beach – all three of which are in the top ten in terms of revenue according to the study by App Annie- and the most recent launch, Clash Royale). All of them are freemium and produce revenue through incentives and enhanced features available for the game.

Therefore, the first indicator of a mobile game's success is purchase intention, that is, player willingness to purchase virtual items for use in the mobile game (Badrinarayanan et al., 2015). Players may need to buy further add-ons and items if they wish to progress quickly in the game ("extra time", "lives", "moves", virtual items to access higher levels, etc.). Moreover, successful and innovative games have extended the brand with additional products or have been adapted to other entertainment media (Marchand and Hennig-Thurau, 2013). Players can thus extend their relationship with the game by buying promotional and related products such as movies, books, T-shirts, toys, stationery products, and so on. One clear example is Clash of Clans, the game which generated most revenue over the five-year period between 2010-15 according to the above-mentioned study, and which offers action figures, mugs, T-shirts and a whole host of other items featuring the game's characters.

The number of players is key to contributing to a game's success (according to Supercell (Gamespot, 2016), 100 million players go on line at least once every day to play one of its four top games). According to the critical mass theory (Markus, 1987), the existence of a critical mass of consumers is essential to the diffusion of interactive media. Extensive usage creates universal access and there is interdependence between earlier and later users. In the context of mobile games, in order to attract such a mass of players, the role of players in spreading the game by word of mouth is vital (according to a 2015 report by Google 2015, fifty percent of all applications become known through friends, family, and colleagues, and a recommendation from others is the main reason why apps are downloaded). Consequently, the second indicator of success is recruitment, which refers to players' readiness to invite others to download the game or to join them in playing the mobile game (Badrinarayanan et al., 2015). Recruiting new players also involves players providing positive information about the games.

2.4. From Use to Overuse

According to the theory of diffusion of innovations (Rogers, 1995), diffusion is the process through which an innovation is communicated through certain channels over time among the members of a social system. In this process, different categories of adopters are identified based on the time required to adopt an innovation. More than any other, one particular category displays a high degree of opinion leadership: early adopters. Potential adopters look to early adopters for advice and information, such that the latter play an important role in the diffusion process (Rogers, 2002). This pattern of behaviour could be translated to the case of online games. However, are heavy users and people addicted to mobile games disseminators of these games?

Although downloading or inviting is necessary if users are to play, by itself this does not mean they will do so. This is a particularly sensitive issue in the applications market (the same study by Google highlights that 25% of apps installed are never used). The game must “hook” users so that they feel the need to play, a need which the game can satisfy. Put differently, the game must contain a certain addictive element (in the positive sense of the word). However, using the game will not always have a positive effect on players or, indeed, on the firm that produces it. Psychologists and educators agree that the most problematic consequence of playing mobile games is the overuse of the game and the addiction they can cause (Griffiths et al., 2012; Chen and Leung, 2016; Liu and Chang, 2016; Lee et al., 2018). In fact, overuse of games reaches different levels. There are heavy gamers who display no negative psychosocial consequences or addictive symptoms whilst, on the other hand, there are some online gamers who may be considered addicts because they develop psychological and social problems (van Rooij et al., 2010). Video game addiction is a disorder that involves the continued use of video games, too much time spent gaming and difficulties in stopping gaming (van Rooij et al., 2012). In fact, numerous players seem to be susceptible to addiction (Chen and Leung, 2016; Liu and Chang, 2016).

Empirical studies have explored the antecedents of addiction and its negative consequences. According to these studies, addiction to video games is related to individuals’ loneliness, leisure boredom, or lack of self-control (Chen and Leung, 2016). Moreover, the excessive time devoted to game playing may lead to poor academic performance (Leung and Lee, 2012), behavioural deviance (Hull et al., 2014), low quality of interpersonal relationships (Huang et al., 2015), aggressive feelings (Przybylski et al., 2014), poorer mental health and cognitive functioning (Stockdale and Coyne, 2018), or social anxiety (Lo et al., 2005). Some authors have also underlined the positive results of playing games, such as social competence or the increased number of communication partners (Visser et al., 2013).

However, research is yet to explore the role of users and heavy users as well as people addicted to mobile games as disseminators of these games. The current study focuses on the use and overuse of a specific game and proposes three kinds of effects: a direct effect, an inverted U effect, and a mediated effect through performance in the game.

The direct effect of use. Use of a product, in this case a mobile game, creates a consumption habit, a habit that shapes future behaviour. From a commercial standpoint, “habit persistence” refers to the relationship between a consumer’s past likelihood of choosing a specific brand and their current choice probabilities (Gordon et al. 2013; Gordon and Sun, 2015). In Roy et al. (1996), habit persistence implies that the last brand-size combination purchased is more likely to be purchased again. When applied to mobile games, habit persistence is reflected through intense and continued use of the game, such that it will encourage the purchase of virtual items that will, for example, allow players to continue in the game, move up to the next level, etc. Likewise, said “loyalty to the mobile game” generated by addiction might manifest itself through the purchase of related products as well as through recommending the game and new player recruitment. It can be assumed that those who are more attached to the game and who devote most time to playing it are likely to be the best “advertisers” of the game. In marketing, many studies report a positive link between the continued use of a product, a driver of awareness thereof, and a positive valuation of brand extensions to other products (Soumi

and Datta, 2013), or brand loyalty through recommendation or word of mouth –WOM- (Ranjbarian and Barari, 2009; Akbari et al. 2016). Hence:

H1a: Use of a mobile game has a positive effect on the intention to purchase add-ons.

H1b: Use of a mobile game has a positive effect on recruitment.

The mediated effect of use through performance. In addition to the direct effect of use on player behaviour, the effect of use can be mediated by the degree of performance achieved in the game. Alzahrani et al. (2017) explain that games are systems in which artificial conflict and competitive activities are provided to players who strive to achieve a result. For instance, the storyline is an element that motivates and engages players. The degree of performance in the game may be determined not only by players' skills (Badrinarayanan et al., 2015) but also by the time devoted to playing or navigating through a game. Thus, the more time the player devotes to the game, the better the performance, and the greater the progress or achievement. The greater the performance, the greater the need to acquire add-ons and items in order to continue progressing in the game. Moreover, the performance achieved in the game becomes a source of pride, encouraging the player to recommend the game to others in an effort to share their accomplishment. Even if they do not explicitly recommend the game, simply talking about their exploits might persuade others to play. This effect is multiplied in the digital era in which we are today immersed, where individuals share their experiences with their networks of contacts on social media (Facebook, Twitter, Blogs, etc.) (Wiertz and De Ruyter, 2007). As a result of this exchange of experiences, network members might also be expected to have a mutual influence on each other's decisions and behaviour (Kozinets, 2002), in this case through the use of the game. Therefore:

H2a: Performance in a mobile game mediates the effect of use on the intention to purchase add-ons.

H2b: Performance in a mobile game mediates the effect of use on recruitment.

The inverted-U effect of use. As explained, however, overuse can trigger addiction to mobile games and can entail negative consequences. Addiction to games implies that the individual has problems reducing the time spent playing and that playing games dominates their daily life and takes priority over other tasks (Xu et al., 2012). Excessive online gaming might result in depression, anxiety, or substantial amounts of wasted time (Liu and Chang, 2016).

These behaviours can cause a sense of shame and guilt that lead the player to hide their attachment to the game and to avoid talking about it or recommending it. Although players who devote more time to a game do talk about it and do recommend it to other players, a threshold might be assumed to exist. When the level of use is too high (overuse), the feeling of shame and guilt diminishes the player's disclosure of their addiction to the game, thus reducing the level of recruitment. Moreover, an intention to avoid addictive behaviour, which thus leads to less intent to spend money on additional items and add-ons, might also be assumed. In other words, an inverted-U effect of use on purchase intention and recruitment could thus be conjectured. Therefore:

H3a: The use of a mobile game has an inverted-U effect on the intention to purchase add-ons.

H3b: The use of a mobile game has an inverted-U effect on recruitment.

2.5. The Game's Appeal

Game design is the act of deciding what a game should be like (Schell, 2014). In this regard, one question which is ever-present in the mind of mobile game designers undoubtedly concerns which elements of the mobile game will contribute towards its appeal and, ultimately, to its success. Providing an answer to this question is no easy task and the matter has aroused the interest of many

researchers and is one of today's topical issues. Many scholars have explored aspects of video games such as telepresence (Talako et al., 2008; Weibel et al., 2008; Badrinarayanan et al., 2015), immersion (Brockmyer et al., 2009; Reinecke et al., 2012; Christou, 2014), personalization (Choi and Kim, 2004; Kwak et al., 2010), or the more technical features -sound, graphics, background and setting, game duration, rate of play, advancement rate, etc.- (Wood et al., 2004), amongst other variables.

As do the researchers mentioned above, this study also focuses on experience, although it adds a further two variables to the analysis and which might also prove relevant, yet which have thus far received much less attention in the literature: the game's procedural justice and the game's prestige.

The game's experiential value. Mobile games may primarily be considered experience goods (Choi and Kim, 2004). This means that the main value provided by the games is the hedonic value. The hedonic value involves fun and enjoyment and is an outcome related to the entertainment, exploration, and self-expression that are provided by consuming a product or service (Chang, 2013). Badrinarayanan et al. (2014) indicate that video games can offer unique experiential or hedonic consumptive experiences, since they provide enjoyment, escapism, aesthetic appreciation, excitement, or novelty.

The experience value is related to the challenges the game provides: the opportunities for action (Badrinarayanan et al., 2014) or for exercising skills (Badrinarayanan et al., 2015). These challenges stimulate the curiosity and the intention to continue playing. According to Badrinarayanan et al. (2015), when players perceive that the game provides adequate opportunities for exercising their skills, they are likely to be more attracted to that particular game than to others. Game design is also important vis-à-vis providing immersion and interactivity. Interaction is one relevant aspect for an optimal experience in video games (Choi and Kim, 2004; Chang, 2013; Badrinarayanan et al., 2014), and not only involves becoming engaged in the game but also social interaction with other players (Choi and Kim, 2004; Chang, 2013).

For the case of MMORPGs, Choi and Kim (2004) find a clear relationship between experience in the game and intention to continue playing as well as commitment to the community of players. As a result of this commitment, users will develop behaviours that will favour said community, such as recommending use of the game. Yoon et al. (2013) also note that the enjoyment perceived in online games affects intention to play. Should individuals wish to continue playing, they will likely need to buy additional items that will allow them to progress in the game. The literature on consumer behaviour has shown that the hedonic value influences consumer intention to purchase and use products and services (Holbrook and Hirschman, 1982; Miranda, 2009) as well as WOM, particularly with regard to recommending tourist products (Hosany and Witham, 2010; Yoon and Uysal, 2005). Similarly, the hedonic value of the mobile game, related to positive feelings of pleasure, fun, excitement and enjoyment (Triantafyllidou and Siomkos, 2014), is expected to become evident through greater recruitment:

H4a: The experiential value provided by a mobile game has a positive effect on the intention to purchase add-ons.

H4b: The experiential value provided by a mobile game has a positive effect on recruitment.

The game's procedural justice. One aspect of the game on which designers must decide is player judgement. Games are excellent systems for objective assessment and this is one of their most appealing qualities (Schell, 2014). Contrary to what might be expected, people do not "hate" being judged. What they "hate" is being judged unfairly (Schell, 2014). Procedural justice refers to the degree to which consumers feel they have been treated equitably (Ding and Lii, 2016). Procedures are valued insofar as they affect the associated outcomes (Tyler and Blader, 2003). In the case of mobile games, players like games to offer a fair system of evaluation in order to achieve equitable outcomes. A fair game would differentiate between good and bad players. Positive judgement should help the player to improve. When users perceive that the procedure is fair, positive attitudes towards the game are

expected to emerge, increasing the use thereof and the purchase of add-ons that will enable players to achieve higher scores. Indeed, according to Schell (2014), judgement is linked to the fourth level of Maslow's hierarchy; self-esteem. People need to be judged, and being evaluated fairly meets this need. As pointed out earlier, sharing this with others may boost the desire for recognition and, as already stated, players speaking about their achievements may encourage others to join the game. As a result, it is proposed that:

H5a: The procedural justice perceived in a mobile game has a positive effect on the intention to purchase add-ons.

H5b: The procedural justice perceived in a mobile game has a positive effect on recruitment.

The game's prestige. When games become popular or when they stand out due to certain features (difficulty, innovation, novelty, etc.), individuals may feel proud of playing a game. In this sense, based on the idea that the value of a technology increases with the number of those who adopt it and that the value of a network increases with the square of its number of users (Metcalf's law), Hsu and Lu (2004) propose and show that the critical mass of players favours a positive attitude to online games. Perception of critical mass is rapidly strengthened as more people participate in network activities. Moreover, when the reputation of the game increases, belonging to this game's community of players might prove to be prestigious.

According to the interpersonal influence theory (McGuire, 1968), consumer susceptibility to interpersonal influence is defined as the need to identify with or to enhance one's image in the opinion of other important people by acquiring and using products and brands, the willingness to conform to others' expectations regarding purchase decisions, and/or the tendency to learn about products and services by observing others or by seeking information from them (Bearden et al, 1989). A mobile game's prestige should thus be expected to impact on the desire to consume it, including the purchase of add-ons.

Moreover, identifying with the community of players and the sense of belonging developed will be reflected in different behaviours that favour the community as sharing the brand "good news," thus inspiring others to use it, and preaching from the mountain top (Schau et al. 2009). Applied to the mobile game context, player engagement may manifest itself through behaviours that reach beyond what is merely the game itself and that may include purchasing related products or, of course, recommending the game. Hence, it is posited that:

H6a: The prestige of a mobile game has a positive effect on the intention to purchase add-ons.

H6b: The prestige of a mobile game has a positive effect on recruitment.

3. METHODOLOGY

3.1. Data Collection

Information was gathered through a questionnaire given out between January and March 2016 (see Appendix). In order to collect data, a semi-probabilistic sampling method was used. Sampling was carried out by the authors, who distributed the questionnaire among undergraduate students of two Spanish higher education institutions, all of whom were experienced in the use of app games. In the questionnaire, subjects were asked to choose their favourite game app or a game app they were currently playing. They were told that the aim of the study was to analyse their behaviour as gamers and they were also asked to answer the questionnaire, considering their whole relationship with the game app. Participants were asked to answer a questionnaire and to collect two additional questionnaires from other gamers they knew (family, friends and acquaintances of different ages, in order to collect information from different player profiles). Although we are aware that possible bias in the convenience

sampling may have prevented the sample from being representative of the population as a whole, this procedure did allow us to identify the target, namely, app game users. In order to ensure data validity, we pre-tested the questionnaire by having it reviewed by several gamers so as to ensure the clarity of the questions and ascertain that the scales reflected the concepts in the model. Invalid responses were deleted from the dataset (those who failed to identify a specific game app or who identified an inexistent game app, those who indicated that they devoted zero hours to the game app).

Following this non-probabilistic sampling process, a total sample of 369 valid questionnaires were collected. The sample consists of 38.6% men and 61.4% women. Most were students (89.3%), from 15 to 65 years old (45.4% were aged up to 20 years old, 40% between 21 and 25, and 14.6% were over 25 years of age). Despite being a convenience sample, it may be deemed representative of mobile gamer profile in other countries. First, there is no reason to expect different behaviour in Spanish gamers vis-à-vis other gamers, since they are playing international game apps (see Table 2). Moreover, according to the study *Modern mobile gamers*, carried out by the American company Tapjoy in 2019, with a sample of 18,442 mobile gamers, women form the bulk of mobile gamers (62% females versus 38% males), which are similar percentages to those in our work. Moreover, the study also concludes that people of all ages (our questionnaire was answered by people aged between 15 and 65), spanning a wide range of interests, educational backgrounds, marital statuses, and careers, play games on their mobile device.

Table 2 summarizes the type of game apps that were most cited by respondents. Although the sample selection procedure may cause bias in the games analysed, the number of titles available is wide-ranging and representative of the most downloaded game apps over the previous year up to the period when data were collected (ABC, 2015).

3.2. Measurement of Variables

In order to measure the variables proposed in the study, scales used and validated in other previous studies were employed in most cases. Table 3 shows the indicators and their respective descriptive statistics. Items were judged for face validity by the four authors and by a small group of students in order to pinpoint any problems in wording and to ensure that the items actually measured the concepts in our model.

Although previous studies have measured general addiction to videogames (Xu et al., 2012; van Rooij et al., 2012; Lee et al., 2015), the current work sought to measure *use* of a specific game app or *overuse* of it. Therefore, in order to obtain an objective measure, we asked for the number of hours users played the game app each week. A priori we do not establish a threshold between use and overuse in terms of number of hours. The threshold between use and overuse will be manifested in the inflexion point of the proposed inverted-U effect of use on purchases and recruitment, i.e., when the individuals become aware of their addiction. *Performance* in the game app was also measured by means of an item indicating the degree of performance achieved thus far in the game app, on a five-position semantic-differential scale ranging from very low to very high.

As for the game's appeal, we used four items in a five-position Likert scale to measure *experiential value*. On the basis of the scale proposed by Maghnati et al. (2012) for smartphones, experiential value was considered as a formative construct that involves think experience or curiosity, relate experience (relationship with other people) and feel experience (emotions and customization). *Procedural justice* was measured as a reflective scale and consisted of two items (five-position Likert scales) adapted from Erdogan et al. (2001). *Prestige* was measured using the scale proposed by Arnett et al. (2003) as a three-item (five-position Likert scale) reflective scale indicating the perceived value and prestige of the game among other individuals.

In order to measure *purchase intention*, a three-item reflective scale was created that refers to individuals' intention to invest additional money in the game. It is based on the scale proposed by Badrinarayanan et al. (2015). While said authors only consider the intention to buy virtual elements, we added an item that refers to the intention to buy other products related to the game. Finally,

Table 2. Mobile games

Game or Category of Game App	N	%
Candy Crush	118	32.0%
Quiz games (1)	39	10.6%
Clash of Clans	27	7.3%
Football (2)	19	5.1%
Puzzles/Logic/Words (3)	15	4.1%
Combat (4)	14	3.8%
Cards	12	3.3%
Clash Royale	11	3.0%
Cars (5)	11	3.0%
The Simpsons	9	2.4%
Piano tiles	8	2.2%
Farm heroes	7	1.9%
Hay day	7	1.9%
Geometry games (6)	6	1.6%
Angry Birds	5	1.4%
Pet rescue	5	1.4%
Classic board games (7)	3	0.8%
Building - Minecraft/Megapolis	3	0.8%
Hearthstone	2	0.5%
Jelly Splash	2	0.5%
Others	37	10.0%
<i>No respond</i>	9	2.4%
Total	369	100%

(1) Preguntados /Trividados/Atriviate/Quizup/4fotos1palabra/94porciento/Saber y ganar/Cierto o falso

(2) Fifa/Comunio/Score hero/Soccer Stars/Top eleven

(3) 1010/ 2018/ Brainwars/ Sudoku/ Apalabrados/ Sopa de letras

(4) ModernCombat/Star Wars/PlantasvsZombies/Clumsy ninja/D-day

(5) Real racing/ Asphalt/Mario car/Traffic rider/Colin McRae/Dr parking car

(6) Bubble breaker/Bricks demolition/Tetrix/Geometry dash

(7) Chess/Mastermind/Four-in-a-Row

recruitment was measured as a five-item reflective scale based on the proposal of Badrinarayanan et al. (2015) which indicates individuals' perception of their effort to disseminate the game app and the recommendation to friends and other players.

In order to avoid, or at least to minimize, common method variance (CMV) bias, we followed some recommendations by Podsakoff et al. (2003) when designing the questionnaire: item wording was revised so as to avoid ambiguous or unfamiliar terms; different response formats were used; and the question order did not match the causal sequence in the model. In addition, Harman's single-factor test was performed. Exploratory factor analysis with all the indicators resulted in a solution in which eight factors were extracted with an Eigenvalue greater than one accounting for less than 61.4% of explained variance, and with a first factor explaining only 17% of variance. In sum, the procedural remedies applied and the findings of the Harman test suggest that CMV is not a major concern in this study.

Table 3. Measurement of variables

	Mean	Standard Deviation	Loadings	Weights
Use-overuse				
How much time do you devote to this game app each week? (range: 0.1 to 34h)	3.97	4.72		
Performance				
Personal achievement in this game app	3.56	0.906		
Experiential value				
This type of game app arouses my curiosity (VIF=1.224)	2.67	1.204		0.252**
I relate to other people thanks to this game app (VIF=1.405)	1.88	1.194		0.327***
The game app activities and experiences make me feel emotionally happy (VIF=1.537)	2.20	1.142		0.458***
If possible, I like to customize the characters in the game app as much as possible (VIF=1.314)	1.95	1.270		0.359***
Procedural justice				
The system for judging players' results in this game app is fair (VIF=1.024)	3.55	1.015		0.476**
The system for judging differentiates between better and worse players (VIF=1.024)	3.15	1.211		0.829***
Prestige ($\alpha=0.732$; $CR=0.850$; $AVE=0.662$)				
The people I know value this game positively	3.36	1.104	0.585***	
Belonging to this game's player community is prestigious	2.01	1.134	0.916***	
People are proud to belong to this game's player community	2.09	1.195	0.897***	
Purchase intention ($\alpha=0.732$; $CR=0.850$; $AVE=0.662$)				
I intend to purchase virtual elements for this game app	1.31	0.775	0.876***	
There is a strong likelihood that I will purchase virtual elements for this game app	1.25	0.674	0.882***	
I am willing to accept related advertising products (merchandising)	1.67	1.002	0.685***	
Recruitment ($\alpha=0.732$; $CR=0.850$; $AVE=0.662$)				
I always say good things about this game app	3.10	1.065	0.748***	
I recommend this game app to my friends and acquaintances when they ask me	3.25	1.143	0.837***	
I have encouraged other players to take part in this game app	3.15	1.251	0.883***	
Several of my friends take part in the game because I recommended it	2.82	1.320	0.778***	
I like encouraging other people to play so as to form a wider group for developing the game	2.33	1.307	0.709***	

(***) $p < 0.001$

4. RESULTS

The hypotheses were tested using Partial Least Squares Structural Equation Modelling with SmartPLS 3 (Ringle *et al.*, 2015). PLS was chosen because it allows for estimations of complex structural equation models (in our case, with multiple dependent variables as well as mediating and quadratic effects),

and can also handle formative measurement models (in our case, experiential value and procedural justice). PLS provides parameter estimates that maximize the explained variance (R^2 values) of the dependent constructs and does not require any distributional assumption of the observed variables (Hair, Ringle, and Sarstedt, 2011; Hair, Hult, Ringle, and Sarstedt, 2016).

Table 3 shows information concerning the outcomes of the measurement scales' reliability and validity. Cronbach's α coefficient values, composite reliability, and average variance extracted (AVE) are above the recommended thresholds ($\alpha > 0.7$, $CR > 0.7$, $AVE > 0.6$), thus confirming the reliability of the scales. The standardized factor loadings resulting from the PLS estimation of each construct measured are also above the recommended thresholds (standardized loadings > 0.7), allowing us to conclude that these scales exhibit sufficient convergent validity. For the formative indices, the weights of the indicators are all significant. Moreover, variance inflation factors (VIF) are below 5, indicating that multicollinearity is not a problem with these measurement instruments.

Table 4 shows correlations among the constructs for all the variables included in our study. In line with Fornell and Larcker's criterion, the discriminant validity of the reflective scales is confirmed, i.e., the square root of the reflective constructs' AVE is greater than its correlation with the remaining constructs. In addition, the approach recently proposed by Henseler et al. (2015) was applied and confirmed that the heterotrait-monotrait ratio of correlations (HTMT criterion) is below 0.9 for all the reflective constructs. Therefore, it can be concluded that the reflective constructs evidence sufficient discriminant validity.

Table 4. Correlation matrix and Heterotrait-Monotrait ratio

	Experiential Value	Use-Overuse	Performance	Procedural Justice	Purchase Intention	Prestige	Recruitment
Experiential value	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>
Use-overuse	0.107	1.000	0.010	<i>n.a.</i>	0.112	0.047	0.077
Performance	0.186	-0.010	1.000	<i>n.a.</i>	0.062	0.209	0.296
Procedural justice	0.310	0.044	0.217	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>
Purchase intention	0.509	0.094	0.053	0.128	0.842	0.461	0.438
Prestige	0.521	0.036	0.174	0.281	0.377	0.819	0.595
Recruitment	0.536	0.074	0.272	0.306	0.362	0.473	0.801

The diagonal shows the squared-root of the AVE. Above the diagonal, the Heterotrait-Monotrait ratio is shown and, below the diagonal, the correlation values.

Table 5 shows the results of the model estimation. In the model estimation, gender was included as a control variable to control for its effect on all the model constructs. Men perceived the game's appeal (experiential value, procedural justice, and social prestige) more than women, whereas women displayed less intention to purchase additional elements of the game.

As for the proposed hypotheses, results show that the use of a game app does not affect the intention to purchase additional elements, either as a linear ($\beta = 0.006$, *n.s.*) or a quadratic effect ($\beta = -0.014$, *n.s.*), such that H1a and H3a are rejected. However, H1b and H3b are supported. Use, that is, the number of hours devoted to a game, does have a positive effect on recruitment ($\beta = 0.117$, $p = 0.026$). In this case, results also confirm the inverted-U effect ($\beta = -0.089$, $p = 0.016$). There is less recruitment when individuals are at the opposite ends of use: those with less addiction to the game and those with too much addiction recommend the game app less.

In order to test the mediating effect of the level of performance achieved in the game, the effect of use on performance and the effect of performance on both purchase intention and recruitment were estimated. Moreover, indirect effects were also estimated (Table 6). As observed, the degree of

Table 5. Model estimation

Hypotheses	Relationships	Path Coefficient (β)		p-Value (p)
<i>Control effect (Gender)</i>	Gender ^a → Use	0.009		0.876
	Gender → Performance	-0.005		0.924
	Gender → Experiential value	-0.146	**	0.006
	Gender → Procedural justice	-0.238	***	0.000
	Gender → Prestige	-0.122	*	0.039
	Gender → Purchase intention	-0.135	**	0.008
	Gender → Recruitment	-0.042		0.390
<i>H1a</i>	Use → Purchase intention	0.006		0.915
<i>H1b</i>	Use → Recruitment	0.117	*	0.026
<i>H2a/H2b</i>	Use → Performance	0.176	***	0.000
	Performance → Purchase intention	-0.043		0.362
	Performance → Recruitment	0.121	*	0.027
<i>H3a</i>	Use ² → Purchase intention	-0.014		0.642
<i>H3b</i>	Use ² → Recruitment	-0.089	**	0.016
<i>H4a</i>	Experiential value → Purchase intention	0.374	***	0.000
<i>H4b</i>	Experiential value → Recruitment	0.308	***	0.000
<i>H5a</i>	Procedural justice → Purchase intention	-0.127	**	0.011
<i>H5b</i>	Procedural justice → Recruitment	0.130	*	0.025
<i>H6a</i>	Prestige → Purchase intention	0.179	**	0.011
<i>H6b</i>	Prestige → Recruitment	0.224	***	0.000

(^a) 0=Man; 1=Woman

(***) $p < 0.001$; (**) $p < 0.01$; (*) $p < 0.05$

performance in the game mediates the relationship between use and recruitment ($\beta=0.021$, $p=0.079$), thus supporting H2b at the 90% confidence level. Since the direct effect of use on recruitment ($\beta=0.117$, $p=0.026$) is also significant, the degree of performance partially mediates the relationship between use and recruitment. However, performance in the game does not mediate the relationship between use and purchase intention ($\beta=-0.008$, *n.s.*), such that H2a is rejected.

As for the effect of the game's appeal, the perceived experiential value has a positive influence on both purchase intention ($\beta=0.374$, $p=0.000$) and recruitment ($\beta=0.308$, $p=0.000$), thus supporting H4a and H4b. As regards procedural justice, the positive effect on recruitment is significant ($\beta=0.130$,

Table 6. Mediating effect: Indirect and total effects

		Indirect Effect		Total Effect	
<i>H2a</i>	Use → Purchase intention	-0.008		-0.002	
<i>H2b</i>	Use → Recruitment	0.021		0.138	**

(***) $p < 0.001$; (**) $p < 0.01$; (*) $p < 0.05$

$p=0.025$), thus supporting H5b. However, the effect of procedural justice on purchase intention proves to be negative ($\beta=-0.127$, $p=0.011$), such that H5a is rejected. Contrary to expectations, when the game differentiates between the best and the worst players, the latter are less likely to invest in the game. Finally, H6a and H6b are supported. The game's prestige has a positive influence on both purchase intention ($\beta=0.179$, $p=0.011$) and on recruitment ($\beta=0.224$, $p=0.000$).

In sum, add-on purchases, measured in terms of intention, are only affected by the game's appeal: experiential value, procedural justice and social prestige. Neither the time spent playing the game nor player performance will influence said purchases, although they will have an impact on the recruitment of new players. More specifically, as players devote more time and perform better, the effects on the recruitment of new players will be more evident, although there is a limit or inflection point: game overuse. Moreover, the experiential value and social prestige also impact on said recruitment as well as procedural justice at 90% confidence.

5. DISCUSSION AND CONCLUSION

As seen throughout this work, business interest in the video game market is reflected in the field of academic research, with numerous and ever-increasing contributions seeking to gain further insights into current understanding of the phenomenon. Nevertheless, there is still a long way to go. In the present study, our attention focuses on the more commercial aspect of video games, and is one of the first studies to explore players' consumption behaviour, focusing on mobile games or game apps.

Smartphones provide a good way of reaching out to a large audience since said devices have an extremely high penetration rate, which continues to grow (according to Nielsen, smartphone penetration had risen to reach 88% of U.S. mobile subscribers by the end of September 2016). Smartphones enable users to play anytime and anywhere, to activate functions based on geolocation or to engage in action which merges the real with the virtual - such as enhanced reality -, to name just a few of the possibilities. However, the ubiquity of mobile phones does have its dark side, an issue that is particularly noticeable in the case of adolescents and young adults. Young adults use mobile phones for a wide variety of tasks (messaging, chatting, social networking, gaming, searching for information, shopping, etc.), which results in excessive use and perceived dependence on mobile phones (Lopez-Fernandez et al., 2017) as well as problems of addiction (Salehan and Negahban, 2013). According to a study by the market research firm Newzoo (2019), gaming is the third-most-popular app category, and 1 in 2 mobile app users have opened a game app in the last seven days. They estimate that the number of people who will play mobile games around the world in 2019 will reach 2.4 billion.

Given such a context, what are the "ingredients" that make for a successful game? To answer this question, our research considers two kinds of variables; addiction and the interest the game holds. We explore how they impact the purchase of additional items and products related to the game, and new player recruitment. Moreover, the role played by the performance achieved is also examined. This paper extends the literature by offering a different approach to the addiction variable and by looking at other hitherto unexplored variables that act as drivers of players' consumer behaviour (perceived justice and game prestige). By way of a theoretical contribution, we analyse investment in the game and the recruitment of new players based on the theory of diffusion of innovations (Rogers, 1995). Specifically, we explore the ability of early adopters who have become heavy and addicted users to act as opinion leaders. The results to emerge highlight the importance for organizations (as well as for the players themselves, of course) of "controlling" addiction to mobile games. Provided it is contained, addiction may prove to be positive (which may, a priori, seem contradictory), as well as beneficial to the companies that design mobile games. "Intensive" use encourages players to recruit new players, particularly those who achieve good scores, and who also wish to boast about their exploits. However, rather than creating a feeling of pride, "excessive" use might lead individuals to try to conceal the fact that they are players, and not invite others to take part in their game. Recruiting new players is

also positively impacted by the interest the game arouses, more specifically due to its experiential value, perceived justice in player evaluation, and prestige. Nevertheless, since the sample of gamers was small, the inferences and generalization of the results should be interpreted with caution.

5.1. Practical Implications

Given all of this, what can firms do to increase the number of players through user recommendation? When faced with excessive use behaviour, it might prove beneficial to try to moderate the relationship with the player in order to continue attracting new players. Thus, it might not be advisable to over-encourage heavy users to increase the time they play, although they should obviously not be discouraged from playing. Users should also be frequently reminded of their achievements by keeping these present in the game interface (through rankings, trophies, medals or any form of explicit recognition), and by including tools that allow players to share their exploits with their network of contacts easily and immediately. In this sense, as with social networks, the descriptive aspect with third parties and recognition thereof play a key role for certain users (see the case of ego-bloggers, for example). There also seem to be “ego gamers” who wish to show off their achievements to society (one example being gamers’ world championships, such as Major League Gaming or the World Series of Video Games), an aspect that will be explored in greater detail in future research. Having thus appealed to a sufficient critical mass of users, the player community might expand substantially thanks to user recommendation. In sum, firms should nurture and develop this social aspect of gaming. For instance, according to the Annie Report (2016), the social nature of Pokemon GO is one of the main reasons for its success.

Together with this, firms must also offer a positive hedonic experience that is both enjoyable and memorable, and which allows players to enter the “flow”, a concept that has received extensive coverage in video game literature (Brockmyer et al., 2009; Christou, 2014; Norris et al., 2014). This idea is also supported by the findings to emerge from the present research, in the sense that experiential value positively impacts recruitment. Helping people to enjoy themselves and being able to personalise the features of the game are, amongst others, some of the factors that lie behind the success of many games such as Stack Ball, the most downloaded game app in the second quarter of 2019 according to Sensor Tower’s intelligence. This game, exemplified by its simplicity and by the fun it provides, allows players, for example, to be able to change the types and appearance of the “character”.

However, the game must also be fair in its criteria and must be perceived as such by users through clear, accessible and transparent instructions, which are known to and shared by the whole community (the community may even act as jury on occasions). This is particularly relevant in videogames in which the competitive aspect is extremely important, such as Run Race 3D, another of the apps with the greatest number of downloads and which involves a very straightforward game dynamic (so easy is it, in fact, that it is recommended for players aged three years and over in Google Play), in addition to offering highly colourful 3D graphics which convey happiness and make the player feel good. In other words, it provides a positive experiential value). All of this may encourage users to recruit new players.

Finally, the game’s prestige will receive feedback from this, and thus also have an effect on recruitment. In this sense, the firm should foster transmission of this prestige by word of mouth, inviting users to share their (preferably favourable) views of the game with others, by creating spaces or functionalities designed for this purpose, and by seeking to turn users into ambassadors of the game, thereby boosting its reputation. In addition, striving to achieve media resonance, as occurred with will have an impact on the game’s prestige and, as a result, on how much it is recommended.

One indication of the game’s prestige may be seen through the ratings the players themselves give, something which the firm responsible should encourage in order to enhance visibility. For example, the three game apps mentioned previously, Stack Ball, Run Race 3D, and Pokemon Go, are given average ratings of above 4 (out of 5) in Google Play, drawing on over 840,000, 406,000 and 12,400,000 opinions, respectively (checked on 7 November 2019). As a result, the firms responsible

should urge their players to rate the game and to share it, getting in touch with them through ads or by email when the game is over, amongst other formats, or by offering them some kind of incentive so as to encourage them to rate the game.

The game's prestige also has a positive impact on the purchase of additional items, as does experience. Investing in the game enables players to form part of a successful game community of users to which they like to belong, and the hedonic value the game provides them with proves sufficient motive for them to make such an investment. Nevertheless, this paper has failed to find any effects of addiction on purchase, such that further inquiry is needed in order to delve deeper into which personal variables may account for this. Hamarie and Keronen (2016) recently conducted a study into the subjective motives that lead users to purchase virtual items, although further research is required in this aspect in order to ascertain player profile, whether it be demographic (sex, income, age, etc.) or by exploring other aspects that are more closely linked to players' psychographic profile or lifestyle. A recent monetization report from the game industry reveals that 48% of revenue is generated by 0.19% of the player population in mobile free-to-play games (Swrve, 2016). As a result, pinpointing who these players are is another avenue of research to be explored in future. Another way to monetize apps is through advertising, particularly when mobile gamers are more receptive to advertising and brands than non-gamers are: on average, 57% of mobile gamers display a favourable attitude toward a suite of global brands that we researched (Newzo 2019). This makes the app gamer market segment, which spans people of all ages, genders and income brackets (Tapjoy 2019), particularly attractive for the firms who advertise. Knowing who these gamers are and how they behave proves critical vis-à-vis designing effective advertising in addition to the actual exposure context to said advertising (in other words, the game design). Yet the importance of reaching mobile players goes further than just their exposure to an advertising stimulus, given that mobile gamers are more likely than non-gamers to have purchase influence on their friends, family, and colleagues (Newzoo 2019). Securing the engagement of these players with companies in order to generate WOM campaigns is another avenue which demands further inquiry (Rutz et al., 2019).

5.2. Limitations and Further Research

Finally, some limitations of our research should be pointed out. First, this paper considers an objective measure of game app use and has not taken into account players' subjective perception of addiction. Even if a player devotes few hours to a game app, it can be perceived as excessive when little time is actually available to them. Moreover, the degree of use or overuse may be related to the type of game app and the possibilities it offers to continue playing more and more. In this line, the product life-cycle of these game apps is usually brief. If gamers expect to quit playing in the short term, recruitment and the intention to purchase adds may decrease. It would be interesting to examine whether different types of game apps produce different intention to purchase or to recruit other gamers.

Second, the wide-ranging selection process may have triggered a certain bias in the game apps analysed. In this line, we are very interested in pervasive games (Kasapakis and Gavalas, 2015). For instance, the launch of Pokemon Go after our data was collected meant that we were unable to include one of the most popular and addictive games in our study. Together with our concern for studying mobile game addiction in itself, the evolution and complexity of 'microtransaction' options related to purchase add-ons (e.g. "loot boxes" in online games) has also led to concerns about vulnerable users (e.g., adolescents) overspending on these schemes (King and Delfabbro, 2019).

Third, this study can be extended by exploring mobile gamer loyalty. Analysing the time devoted to the game, recruitment and purchase of virtual elements will enable groups of individuals to be defined according to gamer loyalty. In this sense, Teng (2016) found that goal proximity increases the motivation to attain gaming goals and, consequently, enhances online gamer loyalty. Another extension would be to analyse online-to-offline marketing in the mobile gaming context. Once gamers have been attracted to the virtual world of a game, they can become potential consumers of related products in the real world (Leung et al., 2019). Gamers' experiences can be enhanced by means of

additional services and experiences offered in the offline channel. These are issues which will also merit more in-depth inquiry.

Finally, in this study we have explored the effect of gamer perceptions vis-à-vis experiential value, procedural justice, and game prestige. Future inquiry should seek to complement this by examining, for instance, the particular impact of specific game executions or mechanics, and which range from how to visually materialise recognition of achievements or the levels through which players progress to specific expressions or textual comments made to players on the platform itself.

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APPENDIX

Questionnaire to Mobile Game Users

This questionnaire aims to analyze the behavior of buying and using games for mobile devices (tablets or smartphones). In order to answer the questionnaire, you must play at least once per month and be at least 18 years old. IT'S ANONYMOUS.

Indicate ONE mobile game (a game app) that you know well, currently participate in, or have recently played:

How much time do you spend on this game throughout the week? _____ hours

Indicate your degree of agreement or disagreement with the following statements:

Table 7.

	Very Low Very High
Degree of difficulty this game has for you	1 2 3 4 5
Personal achievement in this game app	1 2 3 4 5

Table 8.

	Totally Disagree Totally Agree
The system for judging players' results in this game app is fair	1 2 3 4 5
The system for judging differentiates between better and worse players	1 2 3 4 5
This type of game app arouses my curiosity	1 2 3 4 5
I relate to other people thanks to this game app	1 2 3 4 5
The game app activities and experiences make me feel emotionally happy	1 2 3 4 5
If possible, I like to customize the characters in the game app as much as possible	1 2 3 4 5
I intend to purchase virtual elements for this game app	1 2 3 4 5
There is a strong likelihood that I will purchase virtual elements for this game app	1 2 3 4 5
I am willing to accept related advertising products (merchandising)	1 2 3 4 5
I always say good things about this game app	1 2 3 4 5
I recommend this game app to my friends and acquaintances when they ask me	1 2 3 4 5
I have encouraged other players to take part in this game app	1 2 3 4 5
Several of my friends take part in the game because I recommended it	1 2 3 4 5
I like encouraging other people to play so as to form a wider group for developing the game	1 2 3 4 5
The people I know value this game positively	1 2 3 4 5
Belonging to this game's player community is prestigious	1 2 3 4 5
People are proud to belong to this game's player community	1 2 3 4 5

Gender: Male Female

Age: _____

Activity:

Student

Worker (8 or more hours per day)

Worker (less than 8 hours per day)

Exclusively responsible for home activities

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