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Always On: Understanding the Intrinsic Motivations for Playing Games on Smartphones and the Effect of User Characteristics

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Abstract

This study examines the intrinsic motivations that drive the enjoyment of smartphone games and the influence of the characteristics of age, gender and playfulness on such motivations. Using Self-Determination Theory (SDT) as a basis, 340 smartphone gamers were surveyed and the results were analyzed using a multiple linear regression approach. This study provides a clearer idea of the nature of play as it develops in the era of the smartphone game as well as adding another layer to our understanding of intrinsic motivation, insofar as smartphone games can be accessed as necessary for need satisfaction, to experience flow, to gain a sense of escapism and ultimately to allow a player to experience a sense of enjoyment. The ubiquity of smartphones means players now have access to an enjoyable experience that can provide satisfactions that other experiences in their daily life may not allow.

Author Keywords

Mobile gaming; Self determination; Playfulness

Introduction

Recent technological developments such as smartphones and tablets have revolutionized the video game industry. The advent of more powerful mobile phones has put the means of playing video games into the pockets of those who would otherwise never think of investing in a dedicated games platform (*The Economist*, 2011). At present, video gaming potentially represents the largest entertainment industry in the world, with the total global value estimated at approximately US \$115 billion dollars in 2018. Mobile gaming revenues in 2018 are predicted at \$57.9 billion dollars from a player base of 2.22 billion players (NewZoo, 2018). By 2020, mobile gaming is expected to account for over half of the entire gaming market revenue with PC gaming and console gaming accounting for the other half (Mediakix, 2018).

Of all gaming platforms, the smartphone potentially can be seen as dominant due to the fact that it offers a number of features that are well suited to the massive adoption of gaming, including

wide demographics, its status as the only truly interactive platform available in many developing countries, ubiquity, casual usage and links to social networks (Feijoo, Gómez-Barroso, Aguado & Ramos, 2012). Smartphones should be considered separately from tablets as they typically provide a different play experience, with tablet gaming sessions normally lasting three times longer (Feijoo et al., 2012). This no doubt reflects that smartphones are considered an integral part of everyday life, always present, while tablets function more like a laptop in terms of portability and usage. The core value of mobile gaming lies in it providing an enjoyable way to pass the time, and especially its ubiquitous availability and offer of instant entertainment, usually for short, casual play periods (Engl & Nacke, 2012). The advent of the smartphone has meant that the study of mobile media must take into account the specifics of this development (Watkins, Hjorth & Koskinen, 2012).

Background

Nysveen, Pedersen and Thorbjørnsen (2005) state that there is a need to understand what drives consumers' intentions to use mobile services, including games, in order to adapt the services to fulfill consumer motivations for using them. That the cultural penetration of video games and virtual environments will increase is inevitable. As a result, there is a need, including in terms of health and educational outcomes, to employ and develop new theoretical models to empirically explore these domains (Przybylski, Rigby & Ryan, 2010). The field of research on modern mobile gaming is quite new and more research is needed to better understand the market (Kim, 2013). While Merikivi et al. (2017) identify the key elements of mobile game design relevant to enjoyment (and subsequently continued play) as design aesthetics, novelty and challenge, this paper takes an alternative approach to conceptualizing the enjoyment of mobile games.

Conceptualizations such as gamification, the process of game-thinking and game mechanics developed to engage users and solve problems, can be seen as one of the most important areas in terms of behavioral change (Zichermann & Linder, 2013), and is perfectly suited for application in the context of smartphones, given the platform's ubiquity and accessibility. Wei and Lu (2014) examined why people play mobile social games (games played with others) and found that enjoyment and interaction with others are the major motivations for playing mobile social games.

Przybylski et al. (2010) identified that the application of theories of intrinsic motivation in examining and evaluating the ways in which video game engagement shapes psychological processes and influences wellbeing is of immense value in terms of understanding the phenomenon. They further identified that the use of video games has developed from a young male niche into a dominant mainstream entertainment that appeals to all demographics. This suggests the value of considering smartphone gaming from the perspective of intrinsic motivation. Furthermore, now that the demographics of gaming are mainstream, we might ask: how can these differences in user characteristics be examined in terms of their influence on smartphone gaming and intrinsic motivation?

As a result of the above considerations, the following research questions are proposed:

RQ1: What intrinsic motivations drive the enjoyment of smartphone gaming?

RQ2: How do certain user characteristics influence the identified intrinsic motivations of smartphone gaming?

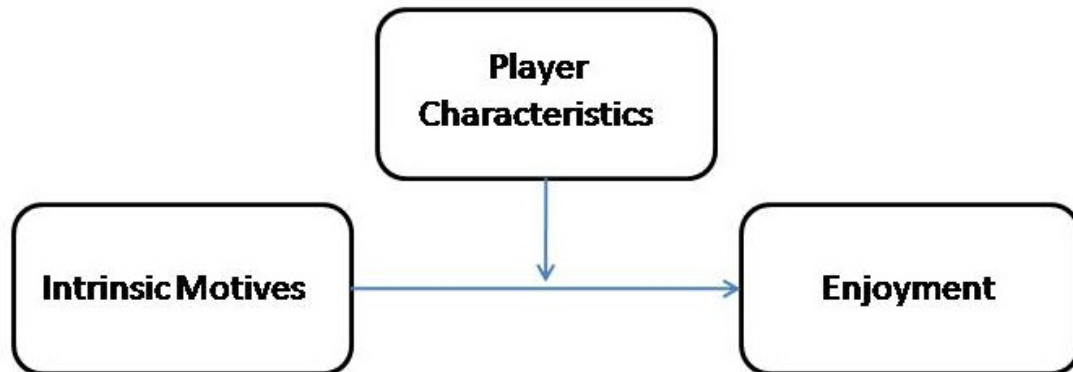


Figure 1: Proposed conceptual model

Intrinsic motivations

A psychological theory of intrinsic motivation, Self Determination Theory (SDT), was chosen as the underlying conceptual framework for this study. Subsequently, three further constructs of intrinsic motivation – ‘flow’, ‘social escapism’ and ‘competition’ – were identified as potentially relevant to the context of mobile gaming and were added to the conceptual model to provide a fuller understanding of the phenomenon.

Self Determination Theory (Deci & Ryan, 1985) has previously been identified as suitable for examining entertainment (Vorderer et al., 2006) and has been applied in the context of video gaming (Ryan, Rigby & Przybylski, 2006). SDT posits that there are three basic psychological needs – competence, autonomy and relatedness – that, once satisfied, lead to greater well-being (Deci & Ryan, 1985). Ryan et al. (2006) developed the Player Experience of Need Satisfaction (PENS) scales to test specific in-game experiences that satisfy the basic psychological needs specified in SDT. Satisfaction of the needs for competence, autonomy and relatedness within gameplay was found to contribute to intrinsic motivation to play through enjoyment of the game, which results in short-term positive shifts in player wellbeing.

The need for competence is the need to feel competent and effective at an activity (Ryan et al., 2006). In terms of video gaming, players want to feel good about their play and their ability to achieve within a game, and the immediate feedback inherent in games allows players to satisfy this need. In the case of video games, the need for competence is a measure of how well games satisfy an individual’s need for competence by engaging in a balanced challenge that offers feedback. Perceived competence is among the most important satisfactions provided by games, as they represent arenas in which a person can feel accomplishment and control (p. 349). This study hypothesizes that players will generally choose to play games that provide them with a balanced challenge in order satisfy this need and enhance their enjoyment.

The need for autonomy concerns individuals' need to feel that they have autonomy, choices and control within an activity (Ryan et al., 2006). In terms of video games, players need to feel that they have control and can exercise some level of autonomous behavior while they play. This can be reflected through choices, options, and perceived freedom while playing a video game: "Game designs can differ in the autonomy afforded within a game, such as the degree of choice one has over the sequence of actions, or the tasks and goals undertaken" (p. 349). Thus, for this study we are hypothesizing that players generally choose to play games they perceive as offering them autonomy.

The need for relatedness is the need to feel connected to others (Ryan et al., 2006). In terms of video games, this need can be satisfied when players relate to others through play, which of course is primarily applicable in multiplayer games with other players. Players, through interactions with other players within a game, enhance their motivation to play through satisfying their need for relatedness (Ryan et al. 2006). While our study does not identify the particular games played by our sample, it does look at their general play on smartphones and thus can include single-player and/or multiplayer games. As a result, we are hypothesizing that in general the need for relatedness can be an intrinsic motivation that drives the general enjoyment of smartphone games.

In the original study (Ryan et al., 2006) the PENS scales demonstrated that "psychologically needs satisfying experiences form the root of intrinsically motivating play, and that such experiences positively influence short-term shifts in well-being" (Przybylski et al., 2010, p. 158).

The PENS scales have been successfully tested and applied in terms of gaming (Przybylski, Ryan & Rigby, 2009; Johnson & Gardner, 2010; Tamborini, Bowman, Eden, Grizzard & Organ, 2010; Peng, Lin, Pfeiffer & Winn, 2012; Reinecke, Tamborini, Grizzard, Lewis, Eden & David, 2012) yet not specifically in the context of mobile gaming. For example, Reinecke et al. (2012) applied the PENS scales in experimental settings to examine how selective exposure to video games is used as a form of mood management. Their findings indicated that players will use games to satisfy the intrinsic needs inherent in the PENS scales and as a result enhance their mood and short-term well-being. Utilization of SDT as a framing theory can be of immense value as "the research reviewed on need satisfaction in games demonstrates the value of bringing clear psychological theories to game study that can drive real hypothesis testing" (Rigby & Ryan, 2011, p. 167). In this case, we are investigating the impact of satisfaction of the needs for competence, autonomy, and relatedness within a conceptual model designed to examine the enjoyment of general gaming on smartphones. Therefore, we are testing whether the key components of the PENS scales are relevant to the increasingly dominant environment of smartphone (and mobile) gaming.

To further examine the intrinsic motivations of smartphone players, three relevant constructs of the experience of 'flow', 'social escapism' and 'competition' were identified as intrinsic motivations of media use that could theoretically drive enjoyment of smartphone games. These constructs were identified as separate to the needs identified in SDT, potentially relevant to the unique context of mobile gaming, and had not previously been examined in this context.

Flow is defined as an extremely enjoyable experience, where an individual engages in an activity with total involvement, enjoyment, control, concentration and intrinsic interest

(Csikszentmihalyi, 1975). Games possess the ideal characteristics as a medium that creates and maintains flow experiences, and flow is linked to the enjoyment of games (Sherry, 2004). Most video games deliberately leverage and utilize elements that can induce flow in their game design, and gamers value games based on whether they can deliver a flow experience (Chen, 2007). As a cognitive state experienced during an activity such as web browsing, flow is determined by “(1) high levels of skill and control; (2) high levels of challenge and arousal; and (3) focused attention; and (4) is enhanced by interactivity and telepresence” (Novak et al., 2000, p. 19). Novak et al. examined the flow experience by directly measuring flow using a three-item scale following a narrative description of flow. Utilizing this same approach to examine flow, Hsu and Lu (2004) identified why people play online games and found that flow experience is positively related to a user’s attitude towards playing an online game and intention to play an online game. Hsu and Lu’s (2004) finding that flow is positively related to intention to play games was one of their notable results, corroborating “the findings of Novak et al. that flow experience was related to intention to use a system” (p. 862). While these results provide some evidence of the value of the selected measure within the context of gaming, this study seeks to identify whether the construct of flow influences the actual enjoyment of smartphone games.

Many people play games to escape, in part, their daily lives (Klug & Schell, 2006). Yee (2006) identified escapism as a motive for play and characterized it as using the online environment to avoid thinking about real-life problems. Okazaki (2008) similarly found escapism to be a motive for mobile gaming. Klimmt and Hartmann (2006) state that “as gamers know to a certain extent what will happen to them during game play, the strength of their motivation to begin a gaming session depends on both their current status and on personal evaluations of what they expect to occur during game play” (p. 136), and, as a result, players know what will happen and how they will feel during and afterwards. Mobile gaming, as an ever-present device, can allow players to play as and when they need/want to. One construct that can be seen to represent this autonomy of choosing to play, in terms of how people potentially manage their moods and leisure or free time through a form of escapism, is ‘social escapism’ (Korgaonkar & Wolin, 1999). Originally examined in relation to web usage, social escapism motivation is seen to occur when individuals use the web to provide diversion, arouse emotions and feelings, overcome loneliness and/or ultimately provide enjoyment. Zhou and Bao (2002) found a positive correlation between social escapism and perceived entertainment. Tojib and Tsarenko (2008) defined social escapism motivation as the extent to which mobile entertainment services (including games) can relieve people’s day-to-day boredom and stress while they are on the move and identified it as an important predictor of mobile entertainment use.

Vorderer, Hartmann and Klimmt (2003) found competition to be a major factor that explains video game enjoyment and subsequent usage and conceptualized it in terms of both the challenge of the game and the desire to play against others. In their investigation of gender differences in video games, Lucas and Sherry (2004) reported that competition (to be the best player of the game) is a stronger motivation for males than females, although it has a motivating influence on both. Sherry et al. (2006) found competition to be a strong motivational factor insofar as video games can provide a level playing field, unlike traditional sports where competition can be influenced by physical advantages. Greenberg et al. (2010) came to the conclusion that competition is the most important motive for playing video games and that this sets video games apart from traditional media.

The needs for competence, autonomy, and relatedness, the experience of flow, social escapism and competition are proposed here as potential intrinsic motivations that drive enjoyment in smartphone gaming. This study posits that these constructs represent a varied range of intrinsic motivations that add original and added value to our theoretical understanding through application to the specified context.

Thus, our first hypothesis is as follows:

Hypothesis 1: The intrinsic motivations of competence, autonomy, relatedness, flow, social escapism, and competition positively influence the enjoyment of smartphone games.

Player Characteristics

The three characteristics of age, gender, and playfulness were chosen as relevant because of their potential influence on the conceptual model, since demographics and personality traits influence preferences for various entertainment choices (Rentfrow, Goldberg & Zilca, 2011). Typically, in areas such as marketing research, consumers are segregated by either demographic variables or psychological variables such as personality traits, yet an approach that integrates both methods is recommended (Sandy, Gosling & Durant, 2013).

In examining the intention to use mobile services, Nsyveen et al. (2005) found that “the effects of age and gender also point to the importance of researchers using not only service characteristics but also user characteristics as potential sources of moderating effects in future studies on drivers of intention to use mobile services” (p. 343). Previous research has revealed that what is attractive in terms of the motives for playing video games varies according to both age and gender (Raney, Smith and Baker, 2006; von Salisch, Opel & Kristen, 2006; Greenberg et al., 2010). Indeed, smartphone gaming has extended the demographics of traditional gaming, with older segments such as baby boomers increasing their video play significantly with the advent of smartphones (Feijoo et al., 2012). Kim (2013) identified that mobile gaming has shifted demographics in terms of both age and gender, in that females may play more than males on mobile phones and that both younger and older players are engaging in mobile gaming. Supporting this, current data from Mediakix (2018) indicates that 23% of mobile gamers are over 65 and 63% of mobile gamers are female. This study seeks to establish whether these demographic characteristics impact upon the intrinsic motivations that drive enjoyment.

Seok and DaCosta (2015) have examined the relationship between personality and mobile gameplay by testing the big five personality traits, to find that personality may be a poor predictor of mobile play. Given this, the present study proposes an alternative view of personality and mobile gaming that can add value to theoretical considerations of the context. Playfulness as a trait or characteristic of an individual has traditionally been examined in the context of children. Some studies have explored playfulness among adults. For example, Glynn and Webster (1992) developed a theory-based measure of adult playfulness, the Adult Playfulness Scale, as a measure of playfulness situated in the workplace which remains the foremost, yet dated, measure of this characteristic. The concept of playfulness in ‘microcomputers’ was developed and examined previously by Webster and Martocchio (1992) and utilized further by Hoffman and Novak (1996), Novak et al. (2000) and Moon and Kim

(2001). Yet these studies remain based on the work environment or the use of computers in the workforce and are therefore potentially not relevant in terms of assessing a hedonic and modern experience such as smartphone gaming.

Given the nature of mobile gaming as always accessible and used for short bursts of time, Barnett's (2007) Young Adult Playfulness Scale was utilized as a measure of playfulness in the present study. Describing their understanding of the concept, Barnett states that "playfulness is the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humor, and/or entertainment" (p. 955). Developed as a measure of playfulness among young adults under the age of 30, the 10-point scale consists of 15 personal characteristics, the mean score of which represents the playfulness of an individual. Barnett's scale demonstrated no differences based on gender, and the propensity towards playfulness appears to be more fully reflected as a characteristic style or approach to one's environment.

Application of the scale in several studies concerning leisure and young adults has further validated the scale in terms of its potential usefulness in this context. Young adults of a more playful nature are more likely to seek companionship through social leisure and to seek to enhance their mood through leisure pursuits (Qian & Yarnal, 2011). Leisure activities experienced are not different, but playful individuals perceive and experience them differently, have different motives and desire different experiences and outcomes from their free time (Barnett, 2011a) and are not motivated to play by tangible rewards (Barnett, 2011b). The present research expands this scale to include adults over the age of 30 and offer a fresh theoretical perspective through application in a new context.

The player characteristics of age, gender and playfulness are proposed as moderating the influence of the intrinsic motivations on the enjoyment of smartphone games. Thus, the second hypothesis developed in our research is as follows:

Hypothesis 2: Player characteristics moderate the influence of the intrinsic motivations that drive the enjoyment of smartphone games.

Data collection and methodology

For the present study a total of 459 responses were obtained from Australian adults. Post data cleaning, 340 survey responses were considered valid. The responses were obtained from the panels of an online research company. The criteria for involvement were that respondents owned a smartphone and played games on it. The final sample was 51% male and 49% female, with a median age of 41. Measures for the needs for competence, autonomy, and relatedness (Ryan et al., 2006), the experience of flow (Hsu & Lu, 2004), social escapism (Korgaonkar & Wolin, 1999), competition (Greenberg et al., 2010) and enjoyment (Ryan, Mims, & Koestner, 1983) were adapted from the relevant existing literature to reflect general play rather than specific game experiences. Players were asked to rank their agreement to such statements as: "I feel very capable and effective when playing games on my phone" (competence); "The games I play on my phone provide me with interesting options and choices" (autonomy); and "I play games on my smartphone, so I can escape from reality" (social escapism).

Table 1 provides an overview of the constructs used in the survey.

Drivers	Key Content	Main Findings
The Need for Competence	(Deci & Ryan 2000; Ryan & Deci 2000; Ryan et al. 2006; Przybylski et al. 2010)	The need for competence as part of the PENS scales can be defined as a measure of how well games satisfy an individual's need for competence through a balanced challenge that offers feedback.
The Need for Autonomy	(Deci & Ryan 2000; Ryan & Deci 2000; Ryan et al. 2006; Przybylski et al. 2010)	The need for autonomy as part of the PENS scales can be defined as a measure of how well games satisfy an individual's need for autonomy through offering an individual the chance to exercise their autonomy in games through opportunity and choice for each player within games.
The Need for Relatedness	(Deci & Ryan 2000; Ryan & Deci 2000; Ryan et al. 2006; Przybylski et al. 2010)	The need for relatedness as part of the PENS scales can be defined as a measure of how well games satisfy an individual's need to feel connected to others through games.
The experience of Flow	(Csikszentmihalyi 1975; Novak et al. 2000; Hsu & Lu 2004)	Flow is experienced as a result of any extremely enjoyable experience, where an individual engages in the activity with total involvement, enjoyment, control, concentration and intrinsic interest.
Social Escapism	(Zillmann 1988; Korgaonkar & Wolin 1999; Zhou & Bao 2002)	Social escapism is experienced when a pleasurable, fun, and enjoyable activity allows one to escape from reality, arousing emotions and feelings as well as relieving day to day boredom and stress.
Competition	(Vorderer, Hartmann, & Klimmt 2003; Lucas & Sherry 2004; Greenberg et al. 2010)	Competition; the need to beat friends or general others, has a motivating influence on play in general and has been shown to influence and motivate video game play.
Playfulness	(Barnett 2007; Barnett 2011; Qian & Yarnal 2011; Barnett 2012)	Playfulness is defined through the Young Adult Playfulness Scale as 'the predisposition to frame a situation in such a way as to provide oneself with amusement, humour, and/or entertainment'. This offers a solid conceptual basis for the phenomenon of mobile play and potentially influences the motivations for play of smartphone games.
Demographics	(Lucas & Sherry 2004; Greenberg et al. 2010)	The demographics of gender and age potentially influence the motivations for play of mobile video games.

Table 1: Overview of the constructs

All items were measured on a 7-point Likert scale ranging from 'Strongly disagree' to 'Strongly agree'. Playfulness (Barnett, 2007) was measured using a 10-point scale as per the previous research.

The PENS scales were adapted from existing post-gameplay experiences to reflect general gameplay experiences. For example, "I experienced a lot of freedom in the game" was adapted to "I experience a lot of freedom in the games I play on my phone". Game enjoyment was measured within the study with items adapted from the Intrinsic Motivation Inventory (IMI, Ryan et al., 1983) utilizing the PENS scales. All scales, apart from the PENS scales, are

presented in the Appendix. Exploratory Factor Analysis (EFA – Principal Component Analysis with Varimax Rotation) was conducted in SPSS to provide a preliminary examination of whether the items measure separate constructs in the new context of smartphone gaming and of general play, rather than specific game instances.

Results

The results of the EFA led to changes to the typology of intrinsic motivations. The needs for competence and autonomy were identified as one construct in terms of the general enjoyment of smartphone games. This potentially reflects that users will play games that they perceive to satisfy both needs through their general play choices and patterns. Social escapism resulted in two separate constructs, ‘social arousal’ and ‘mobile escapism’. One item – “Because it takes me to another world” – was dropped due to cross-loading. The need for relatedness, the experience of flow and competition were retained as originally conceptualized. Table 2 shows the grouping of the items along with their factor loadings and reliability. Figure 2 shows the revised conceptual model while Table 4 illustrates the subsequent changes to the original hypotheses.

Constructs & items	Loadings	Cronbach's Alpha
The need for competence & autonomy		.897
Competence 1	.808	
Competence 2	.835	
Competence 3	.821	
Autonomy 1	.724	
Autonomy 2	.718	
Autonomy 3	.717	
The need for relatedness		.698
Relatedness 1	.608	
Relatedness 2	.614	
Relatedness 3(r)	.745	
The experience of flow		.951
Do you think you have ever experienced flow in playing a game on your smartphone?	.841	
In general, how frequently would you say you have experienced ‘flow’ when you play a smartphone game?	.844	
Most of the time I play a smartphone game I feel that I am in flow.	.826	
Competition		.881
I like to play to prove to my friends that I am the best.	.743	
When I lose to someone, I immediately want to play again in an attempt to beat him/her.	.808	
It is important to me to be the fastest and most skilled person playing the game.	.752	
I get upset when I lose to my friends.	.791	
Mobile escapism		.745
So I can escape from reality.	.769	
So I can get away from what I am doing.	.796	

So I can forget about work/study.	.672	
Because it helps me unwind.	.657	
Social arousal		.865
So I won't be alone.	.704	
Because it shows me how to get along with others.	.789	
Because it stirs me up.	.684	
Because it makes me feel less lonely.	.594	
Because it arouses my emotions and feelings.	.682	
I do not like to play games alone.	.702	
Enjoyment		.814
I enjoy playing games on my phone.	.832	
Playing games on my phone is fun to do.	.831	
I think playing games on my phone is a boring activity.(r)	.591	

Table 2: Factor analysis

EFA was also conducted to examine the factor structure of playfulness and the loadings and reliability of the scale as a whole. Playfulness originally consisted of four factors: 'comedic', 'uninhibited', 'gregarious' and 'dynamic'. As a result of the EFA, gregarious and dynamic were found to form one construct – 'dynamic gregariousness'; while comedic and uninhibited retained their original structure. Playfulness as a whole had a reliability of .901.

Factors & items	Loadings	Cronbach's Alpha
Playfulness overall		.901
Comedic		.888
Funny	.813	
Humorous	.856	
Clowns around	.827	
Jokes/teases	.853	
Uninhibited		.838
Impulsive	.819	
Unpredictable	.815	
Spontaneous	.794	
Adventurous	.620	
Dynamic gregariousness		.907
Cheerful	.790	
Happy	.841	
Friendly	.774	
Outgoing	.759	
Sociable	.808	
Active	.721	
Energetic	.771	

Table 3: Playfulness factor analysis

Conceptual model and extended hypotheses

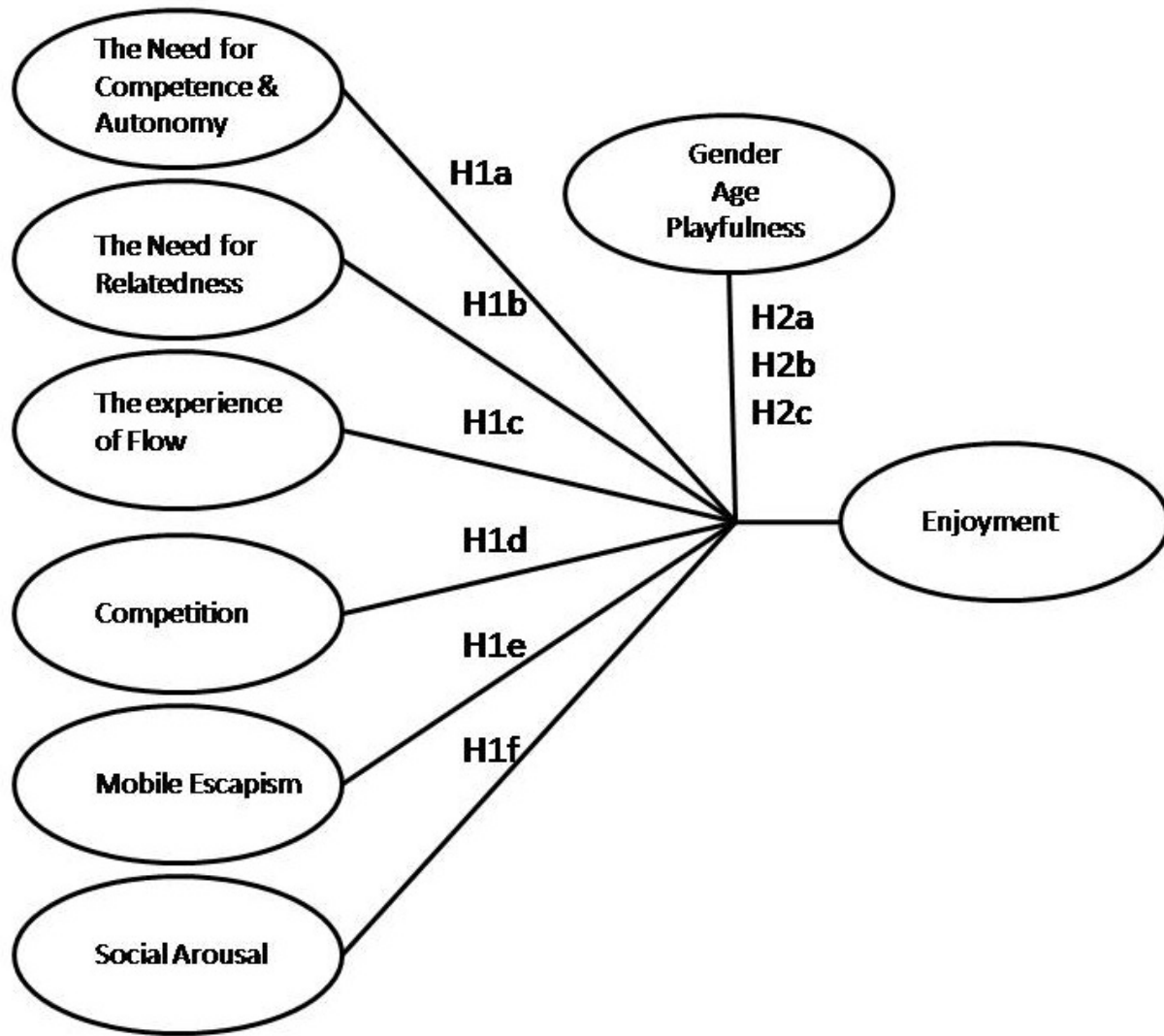


Figure 2: Conceptual model

H1a: The need for competence and autonomy positively influences the enjoyment of smartphone games.

H1b: The need for relatedness positively influences the enjoyment of smartphone games.

H1c: The experience of flow positively influences the enjoyment of smartphone games.

H1d: Competition positively influences the enjoyment of smartphone games.

H1e: Social arousal positively influences the enjoyment of smartphone games.

H1f: Mobile escapism positively influences the enjoyment of smartphone games.

H2a: Gender moderates the relationship between the intrinsic motivations that drive enjoyment of smartphone games.

H2b: Age moderates the relationship between the intrinsic motivations that drive enjoyment of smartphone games.

H2c: Playfulness moderates the relationship between the intrinsic motivations that drive enjoyment of smartphone games.

Table 4: Extended hypotheses

Regression analyses and results

A series of regression analyses were run to test the hypotheses. The need for competence and autonomy, the need for relatedness, the experience of flow, competition, mobile escapism, and social arousal were used in a standard multiple regression to predict enjoyment. The correlation matrix showed that there are no highly significant correlations between the independent variables, indicating there are no multicollinearity issues with the model. The prediction model was statistically significant, with $F(6, 333) = 32.154$, $p < .001$, and accounted for approximately 36% of the variance of enjoyment ($R^2 = .367$, Adjusted $R^2 = .355$).

Variable	Enj	Ply	Age	Gen	SA	ME	Cmp	Flw	Re	C&A
C&A										
Rel										.385*
Flw									.443*	.470*
Cmp								.524*	.416*	.335*
ME							.303*	.346*	.261*	.398*
SA						.489*	.581*	.486*	.481*	.270*
Gen					-.011	.099*	-.133*	-.005	.069	-.016
Age				-.108*	-.134*	-.190*	-.282*	-.274	-.094*	-.260*
Ply			.073	-.025	.237*	.252*	.257*	.304*	.261*	.365*
Enj		.180*	-.056	.093*	.029	.288*	.106*	.315*	.269*	.544*
Mean	5.44	6.25	40.78		2.98	4.55	2.99	3.21	3.36	5.44
SD	0.89	1.22	14.44		1.09	1.08	1.37	1.60	1.20	0.89

* $p < .05$

Table 4: Correlations

The results of the regression analysis showed that the need for competence and autonomy ($\beta = .40, p < .05$), the need for relatedness ($\beta = .10, p < .05$), the experience of flow ($\beta = .09, p < .05$) and mobile escapism ($\beta = .15, p < .05$) all had a positive influence on the enjoyment of smartphone games, while social arousal ($\beta = -.237, p < .05$) did not positively influence enjoyment, and competition ($\beta = -.05, p > .05$) was not significant. The results of the analysis thus supported four of the six initial hypotheses, as shown below.

H1a: The need for competence and autonomy positively influenced the enjoyment of smartphone games. Supported

H1b: The need for relatedness positively influences the enjoyment of smartphone games. Supported

H1c: The experience of flow positively influences the enjoyment of smartphone games. Supported

H1d: Competition positively influences the enjoyment of smartphone games. Not Supported

H1e: Social arousal positively influences the enjoyment of smartphone games. Not Supported

H1f: Mobile escapism positively influences the enjoyment of smartphone games. Supported

Hierarchical regressions were run individually to test hypotheses 2a, 2b and 2c, that gender, age and playfulness moderate the intrinsic motivations that drive the enjoyment of smartphone games. Interaction terms were created as the moderating variable. In the first step, the dependent variable and moderator were run, while the second step involved adding the requisite interaction term. Gender did not moderate the relationship between the intrinsic motivations and enjoyment. When the interaction term was added in the second block, the model was not significant for the need for competence and autonomy $\Delta R^2 = .002, \Delta F(1, 336) = .771, p > .001, b = -.075, t(336) = -.878, p > .01$, the need for relatedness $\Delta R^2 = .003, \Delta F(1, 336) = 9.908, p < .001, b = .062, t(336) = 1.067, p > .01$, between the experience of flow $\Delta R^2 = .000, \Delta F(3, 336) = .110, p < .001, b = -.019, t(336) = -.331, p > .01$ or mobile escapism $\Delta R^2 = .005, \Delta F(1, 336) = 1.791, p < .001, b = -.115, t(336) = -1.338, p > .01$.

Age did not moderate the relationship between the intrinsic motivations and enjoyment. When the interaction term was added in the second block, the model was not significant for the need for competence and autonomy $\Delta R^2 = .001, \Delta F(1, 336) = 0.338, p < .001, b = -.002, t(336) = -.623, p > .01$, the need for relatedness $\Delta R^2 = .004, \Delta F(1, 336) = 1.551, p < .001, b = .003, t(336) = 1.245, p > .01$, the experience of flow $\Delta R^2 = .005, \Delta F(1, 336) = 2.001, p < .001, b = -.003, t(336) = -1.414, p > .01$ or mobile escapism $\Delta R^2 = .009, \Delta F(1, 336) = 3.173, p < .001, b = -.005, t(336) = -1.781, p > .01$.

Playfulness did not moderate the relationship between the intrinsic motivations and enjoyment. When the interaction term was added in the second block, the model was not significant for the need for competence and autonomy $\Delta R^2 = .001, \Delta F(1, 336) = .449, p < .001, b = .022, t(336) = .670, p > .01$, the need for relatedness $\Delta R^2 = .000, \Delta F(1, 336) = .111, p < .001, b = .009, t(336) = .333, p > .01$, the experience of flow $\Delta R^2 = .003, \Delta F(1, 336) = 1.212, p < .001, b = .025, t(336) = 1.101, p > .01$ or mobile escapism $\Delta R^2 = .006, \Delta F(1, 336) = 2.227, p < .001, b = .047, t(336) =$

1.492, $p > .01$. As a result, hypotheses 2a, 2b and 2c were not supported. Age, gender and playfulness did not impact upon the relationship between the intrinsic motivations that drive enjoyment and enjoyment itself. There was no moderation effect by the user characteristics.

Discussion

This research extends the discussion on intrinsic motivations to the context of smartphone games and, as a result, the increasingly dominant context of mobile gaming. Four important intrinsic drivers of enjoyment were identified and provide a conceptual framework for future studies. Through generalizing the PENS scales, this research highlights how the needs for competence and autonomy transcend specific game experiences and can be seen as the most important starting point for designing an enjoyable gaming experience – thus highlighting a critical consideration for game design in the mobile context. In general terms of play, players seek to satisfy both needs through their game playing habits. Potentially players may seek games to satisfy each need separately. For example, a player may play one game on their mobile device to challenge themselves while playing another to express themselves through freedom of choices and options. Optimally, if games can provide a measured challenge and provide players with a measure of freedom in their play then ultimately a game will not be enjoyable and as a result potentially successful.

This research also improves understanding of the intrinsic motivations of play. It provides counter-arguments to the idea that competition is the strongest motivation to play games (Greenberg et al., 2010) as in the context of smartphone games competition is not a strong motivation to play. Instead, smartphones – as an ever-present, always accessible device – offer a different experience that is intrinsically motivated by the needs for competence and autonomy (primarily) but also the need for relatedness, the experience of flow and mobile escapism. Thus, we can see that mobile games can potentially provide a means to connect with others and satisfy a player's need for relatedness (depending on game choice). Engl and Nacke (2012) defined mobile gaming as characterized by short, casual play sessions, yet the experience of mobile gaming has changed and extended rapidly over recent times. The experience of flow can now be considered an important driver of enjoyment, demonstrating that mobile games can now be played as an immersive event where players potentially play for extended periods of time, losing themselves in the experience. Finally, this research has established mobile escapism as an important construct that supports the use of the smartphone as a relief from daily stress and potentially other people.

This area of research into video games in general remains underrepresented in discipline-specific studies; and this study thus provides one starting point for future research considerations. The use of constructs and scales from several different academic disciplines in a new and unique context adds value here as it allows us to expand the relatively young academic discipline of video games. Examining player's general smartphone play habits rather than a single game play experience validates Rigby's (2004) assertion that it is not the particular game that matters but what drives people to choose to play the games they do. This research examines a traditional theory of SDT within a specific context not previously examined using this theory. Specifically, the PENS scales are generalized to test their value in examining an overarching model of game

enjoyment as opposed to their previous use in testing specific games experiences. To add value to the use of these scales, several other intrinsic motivations are added to test for their impact on enjoyment. As a result, a unique combination of intrinsic motivations can be seen to influence the enjoyment of smartphone games. Through an examination of the impact that the characteristics of age, gender and playfulness have on the relationship between intrinsic motivations and the enjoyment of smartphone games, this research offers an understanding that these characteristics may have less influence on intrinsic motivations, and this particular context, than the previous literature would indicate. It is therefore evident that smartphone and mobile gaming is a context that can allow for unexpected results as we seek to understand the most ubiquitous and personal developments in modern technology. The key aspect of the smartphone context that requires a new conceptualization lies in the instant gratification of needs that the accessibility of the smartphone offers. No other mode of play has ever been as instantly accessible as the player desires.

The new and original aspects of mobile gaming, particularly its ever-present accessibility, provide an opportunity to revisit the theories that support research on video gaming. Previous assumptions of play and video games as a fixed and situated activity can be disregarded and new conceptualizations are necessary to take into account the extent of play through video games on mobile devices that are currently reshaping human behavior. Given that the emergence of smartphone gaming has changed much about games studies inquiry (Christensen & Prax, 2012), that mobile games can provide new insights into the rise of smartphones (Hjorth, 2011) and that little research actually explains the key success factors within this business (Park & Kim, 2013), the outcomes of the present research make a significant contribution to our understanding of this technology, and its impacts and implications.

Crucially, smartphone (and mobile) games can be accessed to satisfy needs for competence, autonomy and relatedness, to experience flow, to gain a sense of escapism and ultimately to experience a sense of enjoyment. The contribution of this research to our knowledge of play, intrinsic motivation and why this context requires a different conceptualization rests principally on the characteristic of smartphone games as always available. This represents a key change in how people can access a mode of play almost at whim and provide access to an enjoyable experience that can provide satisfactions that their current experiences may not allow. Play as an intrinsically motivated, frequently repeated escape from reality that can satisfy our perceived needs is now available quite literally at the touch of a button.

Limitations and future research

The lack of an empirically sound usage variable limits this research. Self-reported usage remains a flawed measure. This is evident in the findings on the construct of flow as it specifically identifies losing track of time as part of the construct. Actual app and game usage studies based on data collected by service providers in conjunction with surveys would allow for a more in-depth understanding of the phenomenon. The difficulties and privacy issues inherent to obtaining such data point to a need for researchers to work more closely with service providers.

This study is the first to utilize the Young Adult Playfulness Scales as part of video game research. More research on the concept of adult playfulness needs to be undertaken so that the association between this potential player characteristic and gaming can be more clearly understood. Given that we are entering an era in which play increasingly continues to define our consumption experiences, use of this scale in future studies will further understanding of intrinsic motivation at a time of continued technological development.

The smartphone and mobile experience remains contextually based. Future research should examine in more detail the contextual influences that drive mobile play. For example, understanding the potential influence of different life stages on the use or enjoyment of mobile gaming would provide a richer explanation of the phenomenon.

Conclusion

Smartphones, and associated technologies, such as phablets and tablets, are fast becoming the single most ubiquitous and accessible piece of personal technology throughout the world, and gameplay is fast becoming one of the more pervasive uses for them. Mobile gaming is one of the fastest growing, increasingly influential and potentially lucrative industries globally. This paper presents insights into what players really want from mobile games: a game that challenges them, gives them autonomy in how they can overcome challenges, and allows them to get away from it all for a short while, in order to experience a sense of wellbeing.

Whether games are designed for marketing, education, health or other purposes, or for sheer fun, it remains imperative that they satisfy players' needs and thus provide players with enjoyment. This will prove crucial for realizing the end goal of any games based on mobile platforms.

This research extends our knowledge of intrinsic motivation by highlighting the value of amalgamating different scales in order to test a new context or phenomenon. Further value is added through the realization that the PENS scales have value in enhancing understanding of players' overall motivations for play rather than simply testing specific games. An increasingly large number of adults play games on their mobile devices, and these games continue to advance in terms of design and appeal. The unique aspects of the context, particularly the ever-present accessibility, demand a fresh perspective and a unique combination of variables to examine the theories of traditional video gaming, re-situated in a mobile context. Play can now be viewed as a serious pursuit among adults, and this research begins a discussion on what drives the enjoyment of this particular mode of play. Play on mobiles is a personal pursuit, enjoyed relatively on demand, and not necessarily influenced by playfulness, age or gender. Indeed, play in the modern smartphone era can be viewed as an almost universal pursuit of the satisfaction of powerful intrinsic motivations that ultimately drive player enjoyment.

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Appendix

Scales used

The flow experience

1. Do you think you have ever experienced flow in playing a game on your smartphone?
2. In general, how frequently would you say you have experienced 'flow' when you play a smartphone game?
3. Most of the time I play a smartphone game I feel that I am in flow.

Social escapism

1. So I can escape from reality.
2. Because it stirs me up.
3. Because it arouses my emotions and feelings.
4. Because it makes me feel less lonely.
5. So I can get away from what I am doing.
6. So I can forget about work/study.
7. Because it shows me how to get along with others.
8. Because it helps me unwind.
9. So I won't be alone.
10. I do not like to play games alone.
11. Because it takes me to another world.

Competition

1. I like to play to prove to my friends that I am the best.
2. When I lose to someone, I immediately want to play again in an attempt to beat him/her.
3. It is important to me to be the fastest and most skilled person playing the game.
4. I get upset when I lose to my friends.

Enjoyment

1. I enjoy playing games on my phone.
 2. Playing games on my phone is fun to do.
 3. I think playing games on my phone is a boring activity.(r)
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