



Intrinsic Motivations of Mobility, Play and Enjoyment: The smartphone game experience

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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## Declaration

This work is that of the candidate alone, Brian McCauley. Editing was conducted by Jane Fry in terms of completeness and consistency, and not matters of substance and structure, in accordance with IPed's Australian standards for editing practice and The Higher Degrees by Research Editing Policy. This work has not been submitted previously, in whole or in part, to qualify for any other academic award. The content of this thesis is the result of work which has been carried out since the official commencement date of the approved research program. The relevant ethics procedures and guidelines of RMIT University have been followed and the research has been approved by The RMIT Human Research Ethics Committee.

Brian McCauley

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Intrinsic Motivations of Mobility, Play and Enjoyment;  
The smartphone game experience

Brian McCauley

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## **Abstract**

This thesis investigates the intrinsic motivations for the playing of video games on smartphones through proposing and testing a conceptual model. The concept of play and a theory of intrinsic motivation, Self Determination Theory, provide an underlying theoretical framework. The constructs of the Need for Competence, the Need for Autonomy, the Need for Relatedness, the experience of Flow, Competition and Social Escapism form the basis of the proposed conceptual model as underlying drivers of the enjoyment of games that are intrinsically motivated. Relevant characteristics of players' age, gender and level of playfulness are examined for their potential influence on the model. A pertinent gap was identified in the literature in regards to consumer behaviour and the understanding behind a rapidly evolving field of media enquiry. The conceptual model was established in order to enhance understanding of the representative phenomenon, allow implications to be situated in practical concerns and extend our understanding of intrinsic motivations through the concept of play.

Questionnaires from 340 Australian residents over eighteen who play games on smartphones were analysed. A series of hypotheses were proposed within a causal methodology to facilitate the prediction of enjoyment in terms of significant drivers. The conceptual model was tested by a multiple regression technique in order to establish variables that influence the enjoyment of games on smartphones. The empirical findings of this thesis contribute to an understanding of the process of enjoyment of games and are situated in a consumer behaviour/marketing paradigm. At an academic level, this thesis extends the marketing literature on a relatively new yet expanding area of interest and provides several new avenues of potential research opportunities. As mobile devices and games continue to grow in popularity, revenue and influence in many different areas of business and life, it is important that academia keep pace with new developments. This thesis provides insights that add to, extend, compliment and question the existing literature. Crucially, as a result of these findings the enjoyment of play on smartphones is conceptually articulated as a series of key intrinsic motivations.

**Keywords:** Play, intrinsic motivation, smartphones, Self Determination Theory, regression, enjoyment, playfulness

# Chapter 1

## INTRODUCTION

### 1.1 Introduction

The world has changed...

We no longer live in a world where teenage boys and dedicated games consoles prevail as the face of video gaming. While hardcore gamers remain the archetypical young male, who invests time and resources into playing more complicated games, there are now many more casual players who spend less time and attention on simpler games such as those played on mobile phones (The Economist 2011). Mobile gaming has drawn in groups such as women, the elderly and middle-aged commuters who while never describing themselves as gamers are more than happy to play Angry Birds on their smartphones (The Economist 2011). These changes dictate that prevailing wisdoms surrounding video gaming are also subject to change. Play is becoming an increasingly integral aspect of modern life.

As a result of these changes, this research seeks to provide a fresh theoretical perspective on intrinsic motivation through examining the smartphone gaming experience. As technology continues to change the world, it impacts many areas of human development, psychology and consumption. Fundamental assumptions of academic and theoretical perspectives must continually be re-evaluated and re-examined in light of a continually shifting landscape of the human experience. Through applying theories of intrinsic motivations from different academic fields, to a new area of burgeoning research interest, this thesis seeks to offer a new interpretation of established theories and offer a new perspective on the concept of play.

Video games or ‘entertainment software’ as described by Alpert (2007) is big business. With estimated worldwide revenues of \$100 billion and having an industry of \$5 billion value in

Australia (Derby 2010), video games can no longer be dismissed as the plaything of teenage boys and immature men but instead is a multifaceted industry consumed by anybody and everybody, with 45% of game consumers described as female and the average age of an Aussie gamer being over 30 and continuing to rise (Derby 2010). The market for video games is in effect, only limited by the world's appetite for fun and enjoyment (The Economist 2011).

Through the continued adoption of various digital devices we are seeing what can be coined the 'normalisation of gaming' Kultima (2009). Games are becoming more and more entrenched within our society, with companies such as Nintendo actively targeting non-traditional segments such as the family in their marketing activities as far back as 2007 (Sterlicchi 2007). The rise of mobile and casual gaming has in particular led to the recruitment of what in the past has been seen as traditional non-players (Hjorth 2011a). Kallio, Mayra and Kaipainen (2010) have identified that rather than labelling people as particular consumers of particular games, we are instead seeing 'the fluid continuity of different people who play to relax, socialize, have fun and entertain themselves who form the majority of the digital gaming culture and who provide the backbone for the emerging 'ludic society' (p. 21).

The rise of the smartphone, pioneered by Apple through the iPhone, has led to further normalisation. 'Within a very short period of time, iPhone spurred the development of thousands of mobile applications that combine mobility, social networking, and multi-media, fundamentally changing the way people interact with the mobile phone and the Internet' (Yoo 2010, p. 214). With ownership becoming almost ubiquitous we are seeing the rise of a population who have access to games whenever and wherever they are. And with 33% of applications downloaded for phones consisting of games and games providing the most revenue (MobiThinking 2013) we can see that consumers are willing to do so. The advent of more powerful mobile phones has put the means of playing video games into the pockets of those who would never think of investing in a

dedicated games platform (The Economist 2011).

The potential inherent in the concept of mobile games is almost infinite. The games industry is changing fast and is thriving on change and innovation that allows it to grow in all sorts of unexpected ways (The Economist 2011). This thesis seeks to address the lag of academia in regards to this phenomenon and utilize these changes to augment our understanding of intrinsic motivation and play in the age of the mobile consumer.

## **1.2 Objective of the Research and Research Problem**

To be motivated is to be moved to do something and, 'its most basic distinction is between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome' (Ryan & Deci 2000, p. 55).

The focus of this thesis is to develop a conceptual model that investigates the psychological constructs that drive preferences and motivate consumption in a particular context. Motivation is explained as identifying how various determinants impel an action towards a goal, in this case the enjoyment of video games on a smartphone. This context was chosen as an examination of the literature concluded that there was a gap in the relevant marketing literature in terms of intrinsic motivation and the mobile experience. Through an examination of this context, theories of intrinsic motivation are re-conceptualized, extended and combined in order to further advance various fields of knowledge. Combining this approach with the psychological construct of playfulness and defined roles such as age and gender further illuminate facets of intrinsic motivation and add value to the contribution of this study.

Given the application of intrinsic motivation through Self Determination Theory is relatively new in terms of video games and Przybylski et al. (2010) advocate that future studies investigate the

area with different approaches in order to allow more definitive conclusions to be drawn. Through application of the Player Experience of Need Satisfaction scales, developed from SDT, in a different context, this study attempts to broaden the understanding of the applicability of the scales. Furthermore Przybylski et al. (2010) identify a limit in their research in that it applied the studies on short-term and post play effects of video games. This thesis approaches the application of the PENS scales as a more long-term approach through examining the needs in terms of the games people generally play rather than examine post play experiences.

This thesis intends to answer the research problem of how can theories of intrinsic motivation illuminate our understanding of mobile consumption through an examination of the smartphone play experience. As a result of this investigation the act of play itself is explained through a series of key intrinsic motivations. The general aim of this thesis is guided by a selection of research questions centred on two themes.

### Conceptual Model

- What model can enhance our understanding of the intrinsic motivations that drive enjoyment of video games on smartphones?
- Which drivers are the most important in understanding the need to play?
- What aspects of consumers further impact upon the proposed conceptual model?
- Can extension of the Player Experience of Need Satisfaction scales (PENS), derived from SDT, be generalized to offer an understanding of why people play?

### Influential aspects of the mobile consumption experience

- How do gender, age and playfulness impact intrinsic motivations?
- Which constructs matter for the enjoyment of games and in effect will affect policy in designing games or gamification?

- What aspects of the consumers can deepen the understanding of the results of the research and further our understanding of variations in intrinsic motivation and the nature of play itself?

It should be noted that similar to Shafer (2013) that this model is not intended to represent the entire process of the enjoyment of mobile games due to the sheer complexity of understanding the production of enjoyment, as noted by Vorderer, Klimmt and Ritterfeld (2004). Through focusing on six independent variables defined as intrinsically motivated and examining their influence on Enjoyment, this research offers a concise approach to the research questions posed here. These independent variables are the Need for Competence, The Need for Autonomy, The Need for Relatedness, Flow, Competition and Social Escapism. These constructs were identified as being relevant to the specifics of the mobile gaming context yet also having the potential to offer a deeper understanding of intrinsic motivation, mobile behaviour and play. Age, gender and playfulness as influential categorical segmentation variables as well as moderating influences on the conceptual model add an extra theoretical perspective for the examination of play in this context.

### **1.3 Background of the Research**

In order to appropriately frame the scale and significance of gaming and smartphones, this section outlines the extent and growth of the smartphone and gaming industry. The scale and success of the industry demonstrates that smartphone gaming represents a valid field of inquiry both in terms of practical applications and theoretical considerations. Video gaming represents the largest entertainment industry in the world (Parker, Cox & Thompson 2014) with the total global value estimated at 93 billion dollars for 2013, growing to 111 billion dollars in 2015 (Gartner 2013).

On November 8<sup>th</sup> 2011, Modern Warfare 3, the video game, was released on PC, Xbox 360 and Playstation 3 and within 24 hours had sold 26 million units, amassing sales of over \$400 million. This was 5 times the opening day revenues of the record opening film, Harry Potter and subsequently has made over one billion dollars. Since then, Grand Theft Auto VI made \$800 million on its first day of release in September 2013 while two months later a billion dollars worth of Call of Duty: Ghosts, were shipped on release day. These record breaking numbers pale in comparison with the potential reach of mobile gaming. While there are forty million *monthly* active players across all of the Call of Duty titles (Stuart 2014), there are ninety three million people are playing Candy Crush Saga more than 1billion times *daily* (Dredge 2014).The escalating numbers of ownership of smartphones and tablets has opened up a broader spectrum of potential gamers. These gamers are ready to play, with games such as Candy Crush Saga earning millions in revenue per day and others such as Angry Birds having been downloaded over a billion times.

A report on Mobile Gaming by NewZoo (2013) estimates the total worldwide mobile gaming revenue to be \$9.1 billion, \$7 billion of which is exclusive to smartphone gaming. The total revenue is estimated to increase to a staggering \$23.9 billion by 2016, with smartphone revenues having almost doubled to \$13.9 billion. Gartner (2013) predicts mobile gaming revenues of \$22 billion by 2015 and identifies mobile gaming as the second only to console games in terms of market share. The Casual Games Association (CGA 2014) estimates the current global revenues of mobile gaming to stand at \$12.3billion and to account for 27.8% of all industry revenue by 2016. An estimated 71% of these mobile gamers play on their smartphone (CGA 2014).

The rapid proliferation of the smartphone throughout the world has facilitated the growth and spread of smartphone gaming. Currently 65% of Australians currently owning own a smartphone

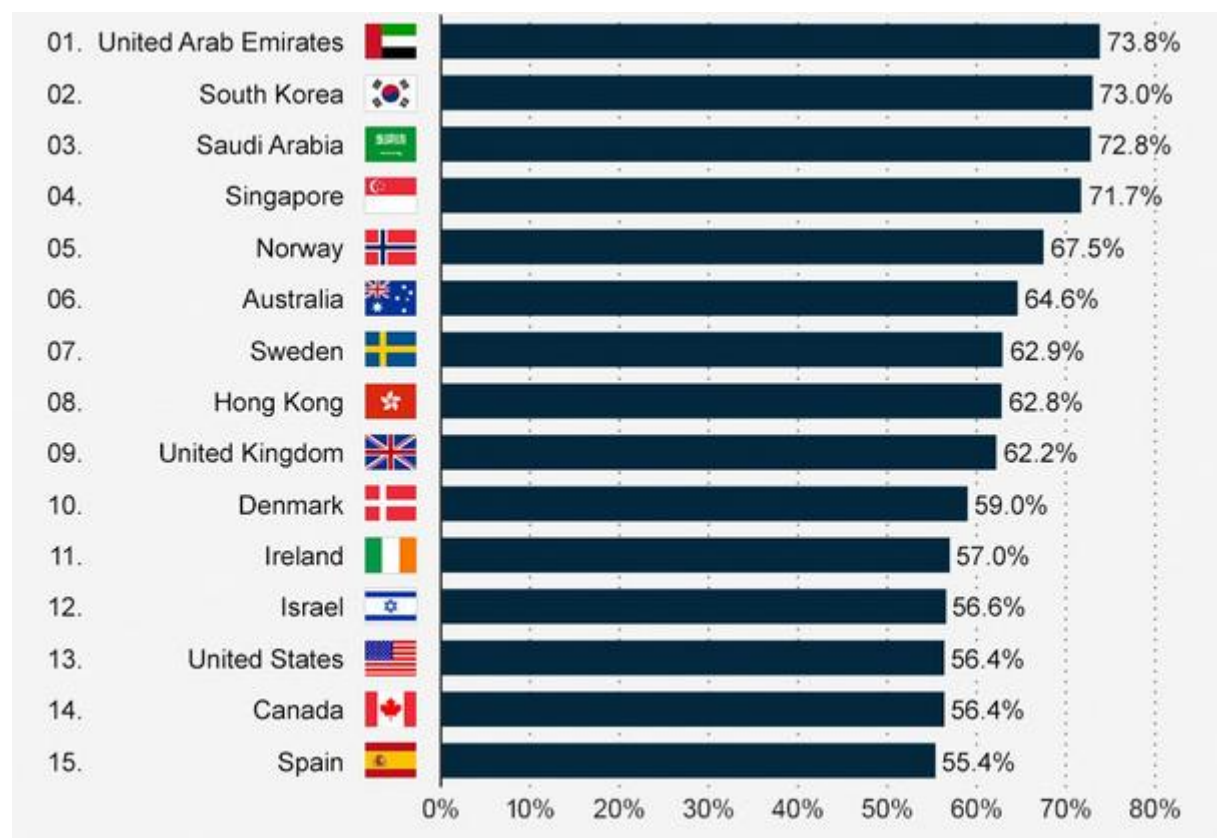
and one third of the entire global population is predicted to own one by 2017. Tables 1.1 and 1.2 illustrate the rise of the smartphone.

**Table 1.1 Smartphone users and Penetration worldwide, 2012–2017**

	Year					
	2012	2013	2014	2015	2016	2017
Smartphone users (billions)	1.13	1.43	1.75	2.03	2.28	2.50
% change	68.4%	27.1%	22.5%	15.9%	12.3%	9.7%
% of mobile phone users	27.6%	33.0%	38.5%	42.6%	46.1%	48.8%
% of population	16.0%	20.2%	24.4%	28.0%	31.2%	33.8%

Source: Emarketer

**Figure 1.1 Smartphone by country**



Source: Mashable.com

In 2006 Nintendo introduced the Wii, a games console targeted at casual gamers and the family which was ultimately credited as being very successful at opening up games to a broader



audience in terms of demographics. Subsequently the rise of the smartphone and tablet and the resulting accessibility of Apps, in the form of games, has broadened this market of gamers even further and resulted in a standalone industry of gaming that has a much bigger reach than the costly arena of dedicated gaming consoles and high performance PCs.

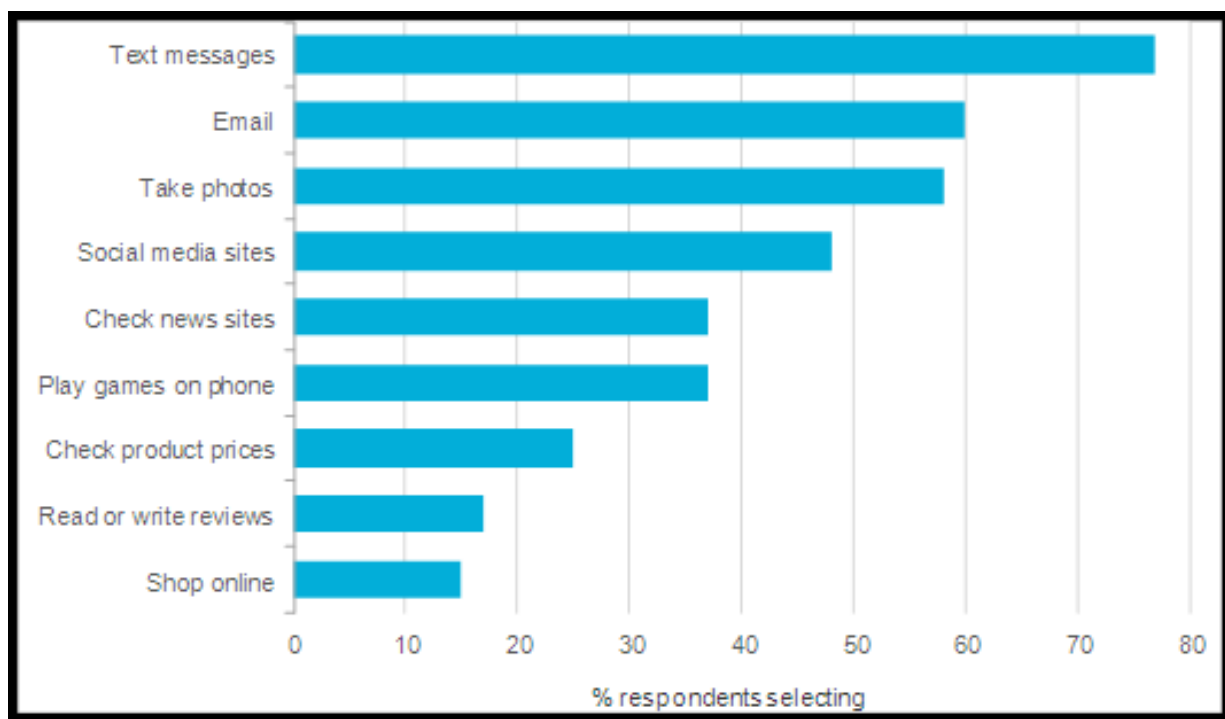
In terms of successful games, Angry Birds is possibly the ultimate success story on mobile platforms. The Angry Birds Franchise has been downloaded over 2 billion times and is rapidly becoming one of the world's biggest brands with 45% of game developer Rovio's 2012 revenue coming from their own branded merchandise (Feehan 2014). The Angry Birds franchise even has a cartoon series with a movie reportedly planned. Yet in 2014, Rovio is transitioning into the freemium model business for their games while trying not to alienate their brand loyal fans who grew to love Angry Birds based on paying small, one-off download fees then getting seemingly-unlimited free updates (Dredge 2014a).

The freemium model is where the initial game is downloaded free and subsequently, assorted optional in game extras and perks are available at a price to generate revenue. This model of business extends to paid games also in the form of further in-app-purchases whereas the paying consumer pays for further perks and options post initial purchase to improve their gaming experience. The two runaway success stories in terms of these models currently are Candy Crush Saga and Clash of Clans. Candy Crush Saga developers King filed IPO registration paperwork for 2013 that revealed that it generated \$1.88 billion in revenue in 2013 with 78% of this coming from Candy Crush Saga alone (David & Picker 2014), which means that Candy Crush made around \$1.54 billion last year, approximately 4 million a dollars per day. Over 90% of all revenue for mobile games comes from the freemium model or in-app-purchases (Wilcox 2014).

Euromonitor (2013) identifies ‘gaming is by far the most popular category of apps in terms of downloads, and generates the most revenue of all the different app types’ (p. 4) and identifies Candy Crush Saga as the most downloaded game across both iOS and Google Play platforms during May 2013. In 2012 a small Finish company, Supercell was grossing one million dollars a day from two titles ‘Hay Day’ and ‘Clash of Clans’(Wauters 2012) and by midway through 2013 this figure had risen to \$2.4 million per day (Shontell 2013).

This rising success of mobile games on phones and tablets is eliminating the need for game specific portable machines as Dredge (2013) tells us that mobile gaming on smartphones is making four times the revenue of the game specific handheld consoles for Sony and Nintendo. Mobile gaming has been expanding strongly at the expense of traditional console and PC games (Euromonitor 2013) demonstrating that not only is mobile gaming a phenomenon in itself but one that can potentially supplant traditional gaming contexts. Dredge (2013) predicts mobile gaming to be a legitimate threat to the next generation of consoles in less than five years as technology continues to develop. According to Euromonitor (2013) over 35 % of respondents use their mobile phone for gaming while away from home, see Table 1.3.

**Figure 1.2 When away from home what activities do you use your phone for?**

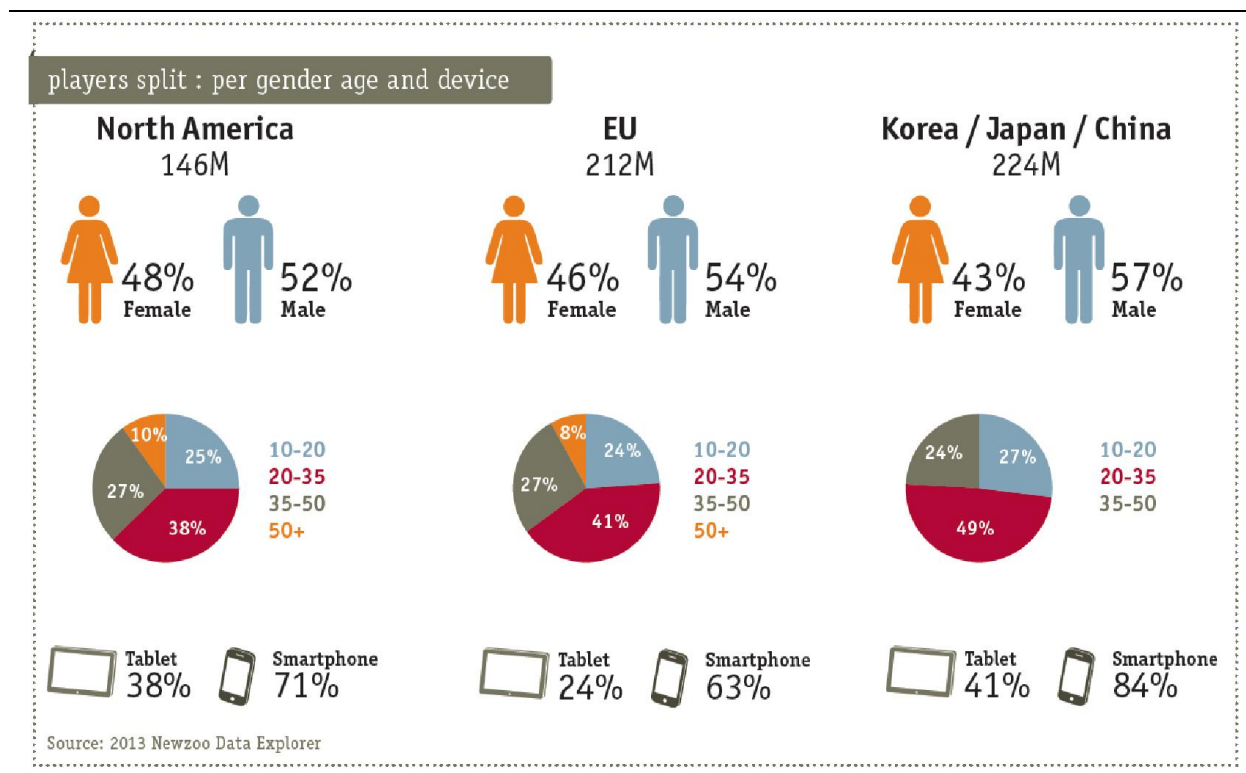


**Source: Euromonitor (2013).**

The rise and proliferation of smartphones and tablets and the subsequent use and apparent dependence on Apps has not only changed the global digital landscape but also exerted a strong influence on all aspects of lifestyles and behaviour (Euromonitor 2013). There is currently a trend towards mobile cocooning, where consumers can be immersed in their own private digital worlds anytime and anywhere, and Euromonitor predicts this trend will only intensify in the future as consumers spend more time immersed in their mobile devices due to the continued development of products. This indicates tremendous potential for growth in areas such as mobile games. The spread of mobile devices and M-commerce will only continue to rise throughout the world and ultimately smartphones and similar devices will become so powerful as to meet virtually all digital needs (Euromonitor 2013). The Euromonitor report provides confirmation of what is readily apparent in every public space, which is that mobile technology is taking over, and games are one of the drivers of this change. As Table 1.4 illustrates, this change is being

embraced by everyone with at least 43% of gamers being female and more than half of all gamers choosing to play on their smartphones.

**Figure 1.3 Who is playing mobile games?**



Source: NewZoo (2013).

IGEA (2014) identifies a number of trends in Australia that reflect how video gaming has risen in importance including that 47% of gamers in Australia are female. In 2014, 93% of Australian households have a device for playing video games while 98% of households with children under the age of eighteen have a device for playing games which can be considered full market penetration (IGEA 2014). While 65% of Australians play video games, 47% of all Australians play games on a mobile phone and for these gamers passing time was the key reason for play. While the average age of an Australian gamer is thirty two, 76% of all gamers are adults over eighteen and 19% of Australian gamers are over fifty one (IGEA 2014).

The sheer scale of the mobile and smartphone gaming industry and rapid adoption by consumers demonstrates that people want to play. This in turn provides a context rich for furthering our understanding of the concept of play itself.

## **1.4 Significance of the Research**

While the background to the thesis demonstrates a valuable and applicable context, this section demonstrates the theoretical and conceptual value of this research in addressing the aporia.

Video games and smartphone gaming constitute an entertainment experience. Vorderer, Steen and Chan (2006) suggest that for an optimal model in the study of entertainment it is important to reconcile together what they call the intentionalist and objectivist stances. They deem the intentionalist stance as utilising a general understanding of agents to formulate a causal theory (Dennett 1999) while their interpretation of the objectivist stance (Leslie 1994) concerns the innate biological impulses and subsequently the developmental psychology of play. ‘Uniting work in the psychology of intrinsic motivation, the cognitive analysis of fiction-based forms of entertainment, and the evolutionary and developmental psychology of play, provides an integrated causal model for the study of entertainment’ (Vorderer, Steen & Chan 2006, p. 14).

Accordingly, this research investigates intrinsic motivation through the use of Self Determination Theory (Deci & Ryan 1985) as a starting point and underlying theoretical base. An examination of the literature and the characteristics of mobile gaming provide a cognitive analysis of mobile gaming through the use of the independent variables; the experience of Flow (Csikszentmihalyi 1975), Social Escapism (Korgaonkar & Wolin 1999), and Competition (Greenberg et al. 2010). In order to examine the impact of the psychology of play, the personality trait of playfulness (Barnett 2007) and the demographics of age and gender, are examined for their potential impact

on the smartphone gaming experience. This represents a cross disciplinary approach through the application of relevant literature garnered from various sources.

As a result, the focus of this thesis is to develop a conceptual model that investigates the psychological constructs that drive the enjoyment of smartphone games. Enjoyment is explained by identifying *the degree of influence these particular drivers have, if any*. This conceptual model is also situated in exploratory findings that enhance the understanding of the players who play games on their smartphone and as a result, deepen understanding of intrinsic motivation through use of a specific context.

A significant contribution of this thesis is the amalgamation of existing intrinsic motivation scales from various fields of enquiry including; gaming, marketing, consumer behavior, media studies and psychology, in order to provide an original conceptualization around the research area. Previous assumptions of play and video games as a situated activity must be disregarded and new conceptualisations are necessary to take into account the level of play through video games on mobile devices that are currently reshaping behaviour. Given that the emergence of smartphone gaming has changed the nature of games studies inquiry (Christensen & Prax 2012), can provide new insights into the rise of smartphones (Hjorth 2011a) and that little research actually explains the key success factors within this business (Park & Kim 2013), the outcomes of this thesis have significant value in terms of a contribution towards academic inquiry and knowledge.

The scales utilized in this research add value to the field of intrinsic motivation through their use in an alternate context. The findings of this research validate the adaptation and reliability of the scales used and adds insight to our understanding of the construct of motivation and its influence on the consumption of smartphone, and by proxy, mobile games in general. The conceptual

model and modified scales identified in this research can be used for future research in the burgeoning area of mobile consumption.

Consequently, while relevant research identified in existing literature may provide a foundation for beginning this research, the outcome of this research aims to contribute more specific insights through addressing such questions as: *What* are some potentially relevant segmentation criteria? *How* are such levels of variability in the gaming experience explained? *What* drives player preference in selecting and playing games? *How* do psychological constructs influence enjoyment? *Do* demographics and certain player characteristics influence the smartphone gaming experience? Can age, gender or playfulness moderate the relationship between intrinsic motivations and enjoyment?

The more intrinsically motivated an activity the more likely people are to enjoy it and do it for its own sake (Ryan & Deci 2000). Play itself can be seen as conducted for the sheer pleasure or enjoyment of the activity itself (Brougère 1999), in effect the more you enjoy something the more you will choose to do it. One of the characteristics of play in this thesis is that it is frequently repeated (Oerder 1999).

The satisfaction of the Needs for Competence, Autonomy and Relatedness have all been found to be linked to not only enjoyment but also game genre preferences and intentions for future play (Ryan et al. 2006). Similarly, Competition has been found to motivate usage and game choice (Vorderer et al. 2003, Sherry et al. 2006). Korgaonkar and Wolin (1999) found that Social Escapism positively influenced usage of online web surfing and online purchases. Flow has also been positively identified as a key motivation, reason for and driver of play. Given that self reported usage in video games is problematic and unreliable (Kahn et al. 2014) this thesis cannot accurately measure usage, yet the key intrinsic motivations inherent in the model have been

previously established as having value in understanding why people both enjoy and choose to perform certain activities such as playing video games. Vorderer et al. (2004) emphasize the growing importance of understanding enjoyment as modern individuals devote incredible amounts of time to the entertainment experience in the pursuit of fun. Sweetser and Wyeth (2005) explain that player enjoyment is the single most important goal for video game play.

This thesis further extends the literature in a number of ways. First, to date, a critical review of marketing literature pertaining to consumer behaviour and games on mobile platforms such as smartphones was found to be relatively limited at the onset of this project. Previous literature on the subject could not take into account the rapid spread and adoption of the technological advances that constitute smartphones. An example of this problem can be seen by the fact that ‘Much related work can usually be identified for an article that compares various technologies. However, if it deals with cutting-edge technology, the number of similar papers shrinks dramatically’ (Heitkötter, Hanschke & Majchrza 2013, p. 299).

There are opportunities within the marketing literature that does not yet fully acknowledge and demonstrate an understanding of a market that can produce a phenomenon such as Angry Birds, or the potential marketing implications of new phenomena such as gamification or games as services. Deterding et al. (2011) propose ‘that current ‘gamified’ applications present emerging phenomena that warrant new concepts and research’ (p. 5). There is an inherent need to investigate these new technologies as they continue to affect daily life in a myriad of ways. McCrea (2011) views mobile gaming as ‘a natural fit for academics seeking to uncover some of the changes to our relationship with our technology that have occurred in the last 15 years: play is a potent concept that lends sometimes deterministic discussions of technology a humanizing quality’ (p. 392). Interpreting the mobile play experience through the intrinsic motivations identified in this research offers insights into this relationship.



While the literature is catching up with the importance of gaming in everyday life, this research offers an alternative conceptual model through the development of new theoretical constructs that can find relevance in an area of burgeoning research. The amalgamation of scales from several different disciplines explored in a new and unique context allows us to re-evaluate traditional interpretation of certain intrinsic motivations. Furthermore, removing the scales from a specific singular experience such as the playing a particular game and generalizing them to enhance our understanding of what drives the overall experience allows reflection on a more macro level, reflecting 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 takes and examines a traditional theory of Self Determination Theory within a specific context not previously examined. Specifically the Player Experience of Need Satisfaction (PENS) scales are generalized to test their value in examining an overarching model of game enjoyment as opposed to previous uses in testing against specific games experiences. To add value to the use of these scales, several other intrinsic motivations are added alongside these variables to test for their impact on enjoyment. Furthermore the intrinsic personality trait of playfulness is tested for its influence on the model. The results of the thesis provide a unique combination of intrinsic motivations influencing the enjoyment of smartphone games. Through an examination of the impact that the characteristics of age, gender and playfulness have between intrinsic motivations and the enjoyment of smartphone games, this research allows an understanding that these characteristics may have less influence on intrinsic motivations and this particular context that the previous literature would indicate. As a result we can see that smartphone and mobile gaming can be seen as a context that can allow for unexpected results as we seek to understand the most ubiquitous and personal development in modern technology. The key aspect of the smartphone context that requires a new conceptualisation lies in the instant

gratification of needs that the accessibility of the smartphone allows before. No other mode of play has ever been ever present and accessible as the player so desires.

The relative newness of the context and the identified lack of research on the subject add significance to the work of this thesis. 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 behind traditional video gaming situated in a unique context. Play can now be viewed as a serious pursuit amongst adults and this research begins a discussion on what drives the enjoyment of this particular mode of play. Play can now be viewed as a personal pursuit, enjoyed relatively on demand, and as one not necessarily influenced by playfulness, age or gender. Indeed play in the modern smartphone era can be seen as a universal pursuit of the satisfaction of certain intrinsic motivations that ultimately drive enjoyment

Previous assumptions of play and video games as a situated activity must be disregarded and new conceptualisations are necessary to take into account the level of play through video games on mobile devices that are currently reshaping behaviour. Given that the emergence of smartphone gaming has changed the nature of games studies inquiry (Christensen & Prax 2012), can provide new insights into the rise of smartphones (Hjorth 2011a) and that little research actually explains the key success factors within this business (Park & Kim 2013), the outcomes of this thesis have significant value in terms of a contribution towards academic inquiry and knowledge.

We have moved away from gaming being the domain of dedicated devices. Chang (2010) identifies a generation of smartphone and iPod players who now download and play games on these 'non-dedicated' devices, further making gaming accessible for anyone. This research intends to further our understanding of what is a very common yet relatively poorly understood

phenomenon within academia. As smartphones usher in a new phase of casual and social media games such as Angry Birds, so too are practices of co-present engagement transforming not only how games are played and by whom, but also the nature of games studies inquiry (Christensen & Prax 2012).

Of all gaming platforms the smartphone can be seen as potentially dominant due to the fact that ‘the mobile platform 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 (any time, any place), casual usage, the ability to be both personal and capable of maintaining close links with social networks, and its ability to supply content and applications adapted to the context of the user’ (Feijoo et al. 2012, p. 219). Although the nature of the eco-systems is complex and success dependent on a myriad of factors, the development costs for mobile games remain substantially lower than for traditional games (Feijoo et al. 2012). Accessibility and lower development costs adds relevance to any enquiry within this context as the smartphone remains the most salient touch point for any game related developments. Not just a gaming device, the practical and professional communications capabilities of the smartphone further justifies its ubiquity.

We are now entering an age where gaming has moved from being part of an exclusive subculture to being a social norm (Kallio, Mayra & Kaipainen 2010, Mayra 2008, Kultima 2009, Pargman & Jacobsson 2006). Technological diffusion and lowered cost barriers plus technological advances have both led to a normalisation of digital play leading to a ‘ludic’ society where digital play through video games can now commonly extend to the phenomenon of parents playing with children. We are entering an age of ‘contextual gaming’ where play is becoming increasingly part of everyday life. Indeed, ‘play is increasingly tied to the practices and rhythms of everyday life’ (Mayra 2008, p. 2). This indicates that furthering the understanding of play through an

exploration of intrinsic motivation and a specific context adds to an increasingly important avenue of enquiry.

Accordingly, the significance and contribution of this thesis can be considered from two perspectives. Firstly, on a practical marketing level through proposing insights relevant for developing games accessible on a device that is becoming almost ubiquitous, this research adds knowledge that can be used through a broad range of potential applications. The contribution on an academic level adds value to disciplines such as marketing, consumer behaviour, communications, and psychology through extending the understanding of intrinsic motivation when applied to a new and relevant context such as mobile gaming. Particular examples of how we enhance our understanding can be seen in that the Needs for Competence and Autonomy can be seen as linked together in terms of how people enjoy the games they choose to play or through how age, gender and playfulness do not impact on how these intrinsic motivations drive enjoyment.

More specifically the contributions to the marketing, gaming, education and psychology literature are:

Through drawing on various constructs from various academic disciplines, a conceptual model is established that identifies and captures a number of intrinsic motivations for the enjoyment of smartphone games.

Self Determination Theory and the relevant scales applicable to video games are extended to the smartphone gaming experience. The Needs for Competence, Autonomy and Relatedness are adapted and examined in relation to their influence on enjoyment, having previously only been tested in terms of 'traditional' gaming experiences.

This thesis adapts and applies three constructs to the smartphone gaming experience that have previously not been empirically tested in this context. The experience of Flow is examined as a result of previous findings that confirmed its importance in terms of traditional video gaming experiences. Previous definitions of the mobile gaming experience have alluded to short casual play sessions that may not allow full immersion of the player to experience flow. This research seeks to empirically examine if the experience can be conceptualized as part of the smartphone game experience. Competition, conceptualized as an intrinsically motivated construct and previously identified as an important motivation for video game play and Social Escapism, a construct previously utilized to examine motivations for using the internet, are also extended to be examined in terms of the smartphone game experience. The findings of the research are also situated within exploratory findings and utilized to provide potential segmentation criteria that further add to a holistic understanding of the modern smartphone gamer.

But this thesis also provides a conceptual understanding that goes beyond the specific context of smartphone gaming and extends the epistemology of play itself. An examination of the literature identified an aporia surrounding the broader context of play and playfulness.

This thesis acknowledges a lack of work around the concept of the trait or characteristic of playfulness. A specific measure of playfulness is adopted from the psychology literature and tested for its influence on the proposed conceptual model. This represents an important step towards integrating the evolutionary and developmental psychology of play within a casual model for the study of entertainment. In this case, the Young Adult Playfulness Scale (Barnett 2007) provides the theoretically most suitable, and most recent, measure of playfulness. Complimenting this approach, the impact of age and gender are also examined in terms of playfulness and the model in order to extend the scale beyond its original use on exclusively adults under thirty.

All play has meaning (Huizinga 1938) yet play itself remains ambiguous as a concept despite being expressed across a diverse range of activities and contexts (Sutton-Smith 2001). Vorderer's (2000) theory of playful action states that *any* activity that is intrinsically motivated, highly attractive, implies a change in perceived reality and is frequently repeated, can be seen as play. Reflecting this, it can be seen that understanding how people play can be seen as central to understanding how consumers consume (Hildebrand 2012). This thesis utilizes Self Determination Theory and other established theories to conceptualize Play as a series of key intrinsic motivations that can explain enjoyment, thus offering further illumination of the concept of Play.

The anytime, anyplace ubiquity of the smartphone device (Feijoo et al. 2012) allows for a fresh and original understanding of play as an activity that is accessible for adults almost constantly in daily life. The concept of play traditionally remains a difficult phenomenon to understand (Sutton-Smith 2001, Piaget 2013) yet forty seven percent of all Australians play games on a mobile phone (IGEA 2014). The impact of this phenomenon represents an opportunity to examine a mode of play that is enjoyed by a large proportion of the adult population and is enjoyed on demand, as desired.

The results and contributions of this thesis are discussed in detail in Chapter 5.

## **1.5 Rationale for the Thesis**

As new technologies present people with more and more media choices, motivation and satisfaction become even more crucial components of audience analysis (Ruggiero 2000). It becomes imperative to present a well designed product that can stand out from the often bewildering mass of options that confront the modern consumer. As we see a growing influence of 'convergent and participatory' media (Jenkins 2006) it becomes more imperative that we seek

to fully understand them. Gaming as one of the first interactive media can be seen as a crucial and pivotal element of this 'shift' and can provide new insights into the rise and use patterns of this new media (Hjorth 2011a). These insights provide impetus towards developing theories and delivering insights that can further understanding in the context of 'new' media.

As a result, research such as this thesis, has important implications for academics, marketers and game designers in a competitive and growing market place. Understanding the importance consumers allocate to the drivers that facilitate to their enjoyment of games can effectively provide an insight to what players deem important and relevant in term of smartphone gaming experience. An understanding of these intrinsic motivations also adds to our understanding of the growing influence of convergent and participatory media and seeks to re-dress the current aporia.

One of the difficulties identified by McCrea (2011) for academics in investigating games is that complex theoretical language has to somehow explain phenomena in a rapidly changing technological landscape. This thesis seeks to avoid overtly complex game-speak and instead root results in an accessible lexicon for those not specialised or inherently familiar with modern gaming. According to Rigby and Ryan (2011) at present there is little meaningful dialogue about the incredible motivational pull that games have, however due to its current prevalence throughout modern society, there has never before been such a strong need to understand video games and the diverse ways they can influence various human behaviours.

Mayra (2006) identifies that the fundamental task of universities is to create knowledge, including within the discipline of video games. The study of video games can be seen to be still in its relative infancy with Corliss (2011) identifying video game studies as being in its formative stages and Prugsamatz, Lowe and Alpert (2010) acknowledging that the scholarly literature within consumer behaviour and marketing has paid little attention to the industry. This

demonstrates that there are gaps in the literature surrounding game studies and a review of the literature identified further gaps pertaining to the mobile gaming experience.

Ryan, Rigby and Przybylski point out that ‘few formal theories of motivation have been applied to games, the motivations of players, and the well-being outcomes of play’ (2006, p. 348) and according to Corliss (2011) there has been an apparent over-emphasise on massive multiplayer online role playing games leading to a disproportionate share of research belonging to this particular genre of gaming. Furthermore, there is a lack of specific theories on video games and as a result there is a potential need for a new set of theories focusing on games and their interactive aspects (Lee, Peng & Park 2009).

Utilisation of SDT as a framing theory can be of immense value as ‘the research reviewed on need satisfaction in games demonstrates the value of bring clear psychological theories to game study that can drive real hypothesis testing’ (Rigby & Ryan 2011, p. 167). People return to a medium they find gratifies their needs (Chen 2011) and through investigating the satisfaction of the needs for Competence, Autonomy and Relatedness in a new context, this thesis can add to our understanding of the intrinsic motivations of media use. While fun has often been ascribed as the key factor in the success of video games and would appear to be the driving force to play, there has been very little psychological research done to explain what this fun consists of (Rigby & Ryan 2011). This thesis takes previous utilization of SDT and Intrinsic Motivation and extends it to the smartphone gaming experience. This approach provides a new approach to a particular context that, while extending previous research also provides an original theoretical perspective.

According to Castells, Fernandez-Ardevol, Qui and Sey (2007) wireless media, the fastest growing communication technology ever, has emerged as one of the defining media of our times. Despite this there still remain a lot research opportunities in the mobile gaming literature.



Wilson, Chesher, Hjorth and Richardson (2011) acknowledge the success of games on mobiles, and identify that this success points to a need to understand play in order to fully comprehend contemporary styles of mobility.

Mobile media in the age of smartphones requires the systematic understanding of its various dimensions (Hjorth, Burgess & Richardson 2012) as the platform offers specific capabilities and characteristics. Indeed as the various contexts of gameplay rapidly change and expand we are forced to re-think what constitutes gameplay in the era of the smartphone (Hjorth 2011a). The social importance of gaming also needs to be understood and located within the complexities of people's daily lives (Gosling & Crawford 2011), particularly given the social nature of the mobile as a device itself. Intrinsically motivated constructs related to the social aspects of smartphone gaming such as The Need for Relatedness, Social Escapism and Competition are utilized in this thesis to reflect this.

Nysveen, Pedersen and Thorbjørnsen (2005) suggest that we need to understand what drives consumer's intentions to use mobile services, including games, in order to adapt the services to fulfil consumer's motivations for using them. As enjoyment of games is what drives usage (Ryan et al. 2006) this thesis can further our knowledge in terms of understanding the drivers of consumer's motivations for using them. New game technologies and faster processors will continue to change gaming; the research challenge is to explain better the underlying processes of game use without simply describing new game experiences (Greenberg et al. 2010). Watkins, Hjorth and Koskinen (2012) put forth strong arguments that the advent of the smartphone means that mobile media must be considered from a perspective that takes this development into account. This puts early studies on mobile gaming in a different context, as they must be considered as an examination of an early historical phenomenon that bears little resemblance to the modern game saturated smartphone era. GPS capabilities, touch-screen, computing power,

social networking, app accessibility and the sheer volume and advances in gaming contribute to this difference. This research offers an understanding of underlying influences for enjoyment and subsequently applies them to new gaming experiences.

The success of Apple's App store and games such as Angry Birds has begun to threaten the traditional business model of developers and publishers buying the right to publish games from the hardware developers such as Sony or Microsoft (McCrea 2011). Indeed Wilson, Chesher, Hjorth and Richardson (2011) identify that sources of games such as the App store and Apple's Game Centre will mediate an expansion of games and their culture in a new direction. Klimmt and Hartmann (2006) pointed out that 'computer games are expensive, not only because they require high-end hardware, but also because the costs for the software itself are remarkable' (p. 133).

The rise of the smartphone as a ubiquitous device has negated the need for high end hardware purchased for the specific event of gaming while the cost of smartphone games are low with many available for free or as little as a dollar. This in turn has led to the current explosion of mobile gaming as the economic barriers towards gaming have been lowered. Park and Kim (2013) point to the fact that the mobile game industry is growing fast due to the rapid diffusion of mobiles throughout the world and this area of growth holds a number of exciting possibilities for new business models and growth strategies. Despite this massive increase in the importance and popularity of mobile games, little research actually explains the key success factors within this business (Park & Kim 2013). Understanding the underlying forces influencing the enjoyment of games and potentially as a result, the choices and decision making behaviour, can empower the requisite parties in designing relevant and effective gaming experiences directed towards appealing to particular gaming cohorts.

Basole and Karla (2012) in examining the significance of the growing influence of the app economy through smartphones identified that the mobile service ecosystem is one of enormous revenue opportunities that is constantly in a state of fundamental and rapid transformation. There has been an explosion in the demand for mobile services and the mobile app store is playing a transformative role in the provision of services and value for customers. Basole and Karla (2012) identify the role that games have played as a launch pad for this mobile application ecosystem including the acquisition of new consumer segments through games and conclude that 'Unquestionably, the market for mobile games is a key driver for the app economy' (p. 33). This underlines the value in investigating a context such as smartphone gaming in that it demonstrates a value beyond direct revenue.

The advent of the iPhone changed the nature of mobile gaming and since 2008 downloading games as apps from an app store has become the normal approach to mobile game consumption and mobile games have become competitive with console games (Feijoo et al. 2012) which serves as a reminder that smartphone games must not be exclusively characterised as mobile games but also considered in the context of a traditional gaming experience. This research focuses on the smartphone as according to Feijoo et al. (2012) smartphones should be considered separately from tablets as they typically provide a different play experience with tablet gaming sessions lasting typically three times longer. Crucially, Kim (2013) states that as the field of research on modern mobile gaming is still quite young more research is necessary to fully understand the market.

Applying theories of Intrinsic Motivation specifically to the context of smartphone gaming offers a considered approach to an area of research that to date, has yet to be fully considered. The sheer scale and spread of the industry offers a salient point to begin extending our understanding of intrinsic motivation and play in the modern world.

## **1.6 Mobile Gaming in the Marketing Literature to Date**

The seminal work to date in marketing specific literature on models to explain mobile usage was by Nysveen, Pederson and Thorbjørnsen (2005) who developed and tested a model to explain consumer's intentions to use mobile service. They examined empirical studies of four mobile services; games, contact services, text messaging and payment. Adopting variables from several areas including uses and gratifications, information systems research and domestication research, all the variables they examined in relation to intention to use services were significant. This approach offers support to the approach of this thesis, in that combining elements of separate research fields adds value to a relatively new phenomenon such as mobiles and mobile gaming.

Nysveen et al. (2005) acknowledge that 'marketing managers should be aware of the sensitivity of service characteristics (type of interactivity and process characteristics) when considering the importance of the antecedents included in our model' (p. 334). This research argues that to include diverse services such as text messaging, contact, payment services and gaming accountable to the same conceptual model, while effective in a macro sense, does not accurately explain or illuminate a specific medium such as mobile gaming. The research of Nysveen et al. (2005) offers a broad perspective on the value of reconciling marketing and mobile gaming, yet does not offer or contribute to the inquiry of intrinsic motivations in the context of modern mobile gaming. The rapidly evolving nature of the technology is an important consideration as 'over the past few years, an array of smart web-capable touch-screen phones such as the HTC Diamond, Samsung Galaxy and the iPhone have transformed mobile game-play' (Hjorth 2011, p. 420). This indicates a need to re-conceptualize the approach towards mobile gaming.

Revels, Tojib and Tsarenko (2010) provide a more recent example of understanding the satisfaction of customers in terms mobile services, utilising a similar model and approach to Nysveen et al. (2005). While both studies provide a good example for methodological approach,

it needs to be remembered when considering game studies as a new discipline ‘that it is critical to step back and consider the new discipline’s character’ (Boellstorff 2006, p. 30). Smartphone gaming as a specific context remains part of the mobile inquiry yet there remains a need to examine it with a discipline specific approach. Through conceptualizing smartphone gaming as intrinsically motivating, this thesis seeks redress the game specific gap in the mobile marketing literature.

The primary spread of gaming on smartphones has been on actual games yet there also remains a need for our understanding of games to be applied elsewhere. What is your mobile coffee loyalty app if it is not a game? Buy five coffees and win one free. Zichermann and Linder (2010) identify phenomena such as this as being of play and games. Feijoo et al. (2012) acknowledged that while there has been some academic interest in the area of mobile entertainment, the available literature has adopted either the perspective of social media or game design and that in effect, that the ‘specific mobile gaming perspective to be insufficiently addressed so far’(p. 212).

There have been several studies on augmented reality games which do have marketing opportunities. The concept of augmented reality utilising smartphones offers further opportunities for gamification and marketing as smartphones utilise GPS and cameras to allow consumers to interact with the real world through a gaming layer that gives ‘the material for a much richer gaming world and user experience. In mobile augmented reality games the playing area becomes borderless and they can be played literally anywhere and anytime’ (Wetzel, Blum, Broll & Oppermann 2011, p. 1). Yet this area of potential interest still remains a niche area of mobile gaming that has yet to be fully embraced by consumers. By contrast, the success of ‘typical’ smartphone games demonstrates where the core focus of consumers is.

Penttinen et al. (2012) did attempt to segment mobile gamers as they identified that a deeper understanding of the values and needs of gamers is necessary. While they did identify that mobile gamers are heterogeneous and seek different experiences from games, their exploratory study seems rooted in a pre smartphone era of gaming that doesn't reflect current practices and technologies. Research on smartphone gaming rooted in marketing and consumer behaviour considerations remains an area rich in potential

Zichermann and Linder (2013) identify games and gamification as one of the most important areas in modern marketing. They identify that this area can deliver affordable, measurable and scalable behavioural change that can benefit all the employees and internal stakeholders of a company as well as cut through the noise and capture consumer's attention for an increase in connection, dialogue and ultimately, loyalty.

There are currently no studies examining mobile gaming and the intrinsic motivations for play within the marketing and consumer behaviour literature. Przybylski et al. (2010) state that the cultural penetration of video games and virtual environments will increase is inevitable, and as a result it there is an important agenda for employing new theoretical models to empirically explore these domains. As a result they posit that new knowledge derives could inform health and education interventions and advance the basic science of what is going on when humans play. As a result of this gap, this thesis offers a viewpoint of mobile gaming that can be considered alongside similar studies yet offers original conclusions and insights that can add to an area of research that has yet to be fully realized.

## **1.7 Managerial Implications**

Mobile Marketing is defined as the use of the mobile device for marketing communications (Phumisak, Donyaprueth & Vatcharaporn 2010).The advent of smartphone, and the rise of

mobile gaming, has many implications in terms of the marketing context. The research conducted here, in deepening our understanding of the intrinsic motivations towards smartphone play, can be extended to broadening the understanding of several areas of marketing and consumer behaviour. This section provides an understanding of the potential managerial implications of the results of this thesis.

One such area of concern for marketers lies in the field of gamification, defined by Deterding et al (2011) as ‘the use of game design elements in non-game contexts’ (p. 3). Zichermann and Cunningham 2011 define it as ‘The process of game-thinking and game mechanics to engage users and solve problems’ (p xiv). A previous simple application of this developing trend can be seen in the use of loyalty programs. Loyalty programs can be seen as a complex game like exercise in achieving rewards, status and benefits, and these game mechanics can be used as levers to drive consumer behaviour (Zichermann & Linder 2010).

In terms of modern gamification, consumers are now equipped with smartphones which allows gameplay as well as being equipped with a GPS that allow for location based services. As more mobile applications adopt gamification combined with location based services to attract users, more and more users are volunteering their personal and social data as well as their specific location in using the services (McKenzie 2011). Applications such as Foursquare or indeed Facebook can allow users to check in and use gamified services. Zichermann and Cunningham (2011) applaud of such programs and games as being simple yet effective in offering the potential to solve specific business problems.

Huotari and Hamari (2011) link gamification to services in defining it as ‘a form of service packaging where a core service is enhanced by a rules-based service system that provides feedback and interaction mechanisms to the user with an aim to facilitate and support the users’

overall value creation' (p. 5). This further highlights the potential of gamification and the need to further understand consumers and their use of smartphones to play games. Deterding et al. (2011) identify 'that current 'gamified' applications present emerging phenomena that warrant new concepts and research' (p. 5). It is predicted that by 2015, seventy percent of the world's largest enterprises will be using aspects of gamification, this will drive fifty percent of all innovation and by the end of the decade American companies alone will spend \$3 billion on it annually (Zichermann & Linder 2013). The value of the gamification market is estimated to be worth \$5.5 billion by 2018 (Gaskell 2013). Marketers must understand exactly what consumers want *from* a game rather than understanding that consumers may simply want a game.

Gamification as a concept has wide ranging implications as there is a robust body of literature that supports the benefits of gaming in both educational and health related outcomes. The greatest differentiation of games, as opposed to more traditional modes of entertainment, is through interactivity, they tap into the hard wired human desire for play that has featured in every documented human culture (The Economist 2011). The use of games in learning is not uncommon with the principals of play being utilised to teach as far back as one thousand years ago (Lee, Peng & Park 2009). Gee (2003) when discussing the benefits of games for education identifies a challenge for educators to teach something that is challenging, while allowing students to enjoy themselves, resulting in a deeper level of learning. This challenge is one that can be answered by video games with Shaffer, Squire, Halverson and Gee stating that 'video games have the potential to change the landscape of education as we know it' (2004, p. 19).

Prensky (2003) identified that there was enormous potential for learning utilising games. Yet a decade later this arena still remains in relative infancy. Development challenges of creating optimal education games, cultural issues associated with the traditional game stereotypes negative opinions about games in education generally and the idea there is something



qualitatively inferior between what can be learned in educational video games and more traditional educational settings have been proposed as reasons for this (Barko & Sadler 2013).

Video games can particularly have an impact on motivation and re-enforcement in learning (Ritterfeld & Weber 2006) as well as a host of other skills, including thinking, problem solving, knowledge, learning outcomes, spatial awareness, cognitive processing and hand eye co-ordination (Leiberman 2006). Prot, McDonald, Anderson and Gentile (2012) in examining whether video games are good or bad, also come to the conclusion that games are effective teachers on multiple levels. As technology has developed video games have been created to deliver education in many fields including economics (Lengwiler 2004) and marketing (Vos & Brennan 2010). ‘Studies consistently show that better satisfaction of intrinsic needs is associated with both greater enjoyment of games as well as enduring learning, performance, creativity, and the transfer of learning from one setting to others’ (Rigby & Ryan 2011, p. 145).

In health terms, there have been several studies that have identified the benefits of video games. For example; assisting children in learning about their cancer (Beale, Kato, Marin-Bowling, Guthrie & Cole 2007), combating obesity (Adamo, Rutherford & Goldfield 2010) and managing diabetes (Lieberman 1998). DeShazo, Harris and Pratt (2010) found that utilising games for diabetes education showed potential yet improvements were needed in expanding the audience past children, creating a more personalised intervention and using more theoretical frameworks. In combating obesity and improving children’s intake of fruit and vegetables, Baranowski, Baranowski, Thompson, Buday, Jago, Griffith, Islam, Nguyen and Watson (2011) found that while the previous game was quite successful further research was needed on the optimal design of the videogame components in order to maximize the benefits. This is due to the fact that a well designed game can be played hundreds of times without resulting in the player feeling bored (Lee, Peng & Park 2009).

Feijoo et al. (2012) have concluded that there is massive potential for mobile games to have influence in cultural, health and educational contexts although to date the role and rise of these 'serious' games has been disappointing. It is imperative that games with educational, or health related benefits, be well designed. This research subsequently will contribute to our understanding of mobile gaming and provide insights that may be valuable when considering game design. Przybylski et al. (2010) state that future intervention-focused video game research in the education and health domains should account for the need satisfaction provided by games when evaluating the influences of games (p. 164). This is particularly relevant here as this research is situated in smartphones, a product that inevitably, almost everyone will have access to.

Smartphone gaming also offers opportunities for advertising. Yoon and Vargas (2013) having investigated how well advertising can be remembered when placed in game, determined that the interplay of gaming and advertising is a burgeoning research area and is a promising channel for brand promotion. Terlutter and Capella (2013) provide a distinction when addressing in digital game advertising between in-game advertising (IGA); which is the inclusion of brands or products within a game primarily designed to be an enjoyable player experience, and advergaming; games specifically designed to promote a brand product or service. Advergaming are usually free of charge, 'easy and fun to play, and offer quick rewards. They are mostly casual games' (Terlutter & Capella 2013, p. 96). Advergaming, despite being of increasing importance, has been relatively underexplored according to Okazaki and Yagüe (2012) who examined responses to an advergaming campaign on a mobile social networking site. Their findings indicated that mobile advergaming can be a valuable tool for marketers as when viewed as an extension of the sponsor brand can be a powerful driver of perceived brand value. Euromonitor

(2013) identifies a growing opportunity for brands to ‘sponsor’ games as they do with real world sports.

Social network games are also experiencing a rise in advertising, and offer another avenue of potential research. These games are often played on mobiles and are mostly casual, ‘but given the considerable reach and popularity of social networks along with the focus on the social interactions in the games warrants a distinctive category for analyses’ (Terlutter & Capella 2013, p. 96). In fact social networks have been identified as a key factor in many consumers’ decisions in which apps or games to download (Taylor, Voelker & Pentina 2011).

The marketing paradigm can be extended further in terms of games in that games can now be viewed as services. Stenros and Sotamaa (2009) identified the rise of a new service paradigm in the form of video games ‘however, academia has thus far mostly stayed silent on the matter’ (p1). They pointed to a business model designed to create a long-term service relationship with the customer through subscription based gaming or expansions and add-ons purchased downloaded post the original purchase of a game. The ‘freemium’ strategy of mobile games, where the initial download is free and the full or extended version of the game must be paid for, can be seen as a reflection of this emerging paradigm. Liu, Au and Seok Choi (2012) conducted an empirical study on mobile apps in the Google Play marketplace and identified that the freemium strategy was positively associated with increased sales and revenue of the paid apps. However the revenue was largely determined by product quality, not product visibility and thus the freemium model works well when an app or game is well designed.

Games for the purposes of gamification and games as services can also be seen as not mutually exclusive. Huotari and Hamari (2012) have linked gamification and services as ‘a process of enhancing a service with affordances for gameful experiences in order to support user’s overall

value creation' (p. 20). Games as services and concepts such as value co-creation in video gaming are still in their infancy in terms of theoretical exploration. This research situates empirical results and findings in a detailed discussion surrounding three successful smartphone games incorporating the freemium model; Candy Crush Saga, Clash of Clans and Football Manager discussed in Section 5.5 and discussed in fuller detail in Appendix 1.9.

Given that enjoyment as a dependable variable has been previously identified as a suitable predictor of usage and future play, this thesis can provide useful insights for these areas of application.

## **1.8 Methodology**

This research utilises a survey approach with adults as the source of data utilising a sample size of three hundred and forty respondents. A sample size of between 200-500 respondents is common practise in similar studies such as Nysveen, Pedersen and Thorbjørnsen (2005), Prugsamatz, Lowe and Alpert (2010), Hsu and Lu (2004) and Korgaonkar and Wolin (1999). This research utilised an online panel survey to provide a relevant cross section. An online panel survey in this instance is provided by Research Now; who provide access to a large database of potential panel members. The target respondents are Australian residents/adults aged 18 plus and an online panel survey enabled the researcher to collect very specific distribution of respondents, if necessary or alternatively a representation of Australian society. In this case those who played games on their smartphones comprised the panel. The filter capabilities of the utilised technologies and Research Now, enabled targeting of the needed respondents and with the online survey it was possible to build in qualifying criteria: for example, at the start of the survey a test question filtered if the respondents play on smartphones. If no, they were screened out. This functionality is impossible for a paper based survey. Subsequently there was targeted sampling in line with the research needs and goals. The appropriate online panel survey service was selected

based on expected data quality. This research designed and hosted the online questionnaire, was distributed (the link) by the online panel survey service to their members.

In terms of selecting a relevant research design, this research will adopt a causal approach facilitating quantitative data analysis. The primary goal of quantitative research is to acquire clearer and more precise theory about relations among predictor variables to therefore gain meaningful insights into hypothesised relationships and verify or validate the existing relationships (Hair, Lukas, Miller, Bush & Ortinau 2008). Consideration towards the research approach also demands identifying critical variables and the relationship proposed between these variables. By doing so, conclusions or inferences can be drawn 'about differences in populations on the basis of measurements made on samples of subjects' (Tabachnick & Fidell 2001, p. 7)

## **1.9 Definition of Terms**

**Motivation:** as a psychological construct is considered a driver of behaviour and action, and is frequently classified as either intrinsic; extrinsic or amotivation.

**Intrinsic Motivation:** as a psychological construct is considered a driver of behaviour and action that results from an individual's own internal preferences and desires.

**Extrinsic Motivation:** as a psychological construct is considered a driver of behaviour and action that results from external influences such as authority or rewards.

**Play:** is a range of voluntary, intrinsically motivated activities normally associated with recreational pleasure and enjoyment. Commonly employed by children and animals as a learning mechanism it can be also seen in the lives of adults through various games or interactions. It is defined by three characteristics; that it is intrinsically motivated and highly attractive, it implies a change in perceived reality and that it is frequently repeated.

**Playfulness:** A trait or characteristic identified as the predisposition to frame a situation in such a way as to provide oneself (and possibly others) with amusement, humour, and/or entertainment.

**The Need for Competence:** An intrinsic need to feel competent at an activity in order to enhance happiness and well-being.

**The Need for Autonomy:** An intrinsic need to feel autonomous and have options in how you achieve a goal during an activity in order to enhance happiness and well-being.

**The Need for Competence & Autonomy:** An intrinsic need to experience both the feelings of competence and autonomy in order to optimally enjoy smartphone gaming.

**The Need for Relatedness:** An intrinsic need to feel related to others around an activity in order to enhance happiness and well-being.

**Social Escapism:** defined as pleasurable, fun, and enjoyable activity that allows one to escape from reality, arousing emotions and feelings as well as relieving day to day boredom and stress.

**Mobile Escapism:** the use of a mobile device that allows one to escape from reality and relieve boredom and stress.

**Competition:** defined in this research as the need to beat or do better than other players while playing games.

**Flow:** an extremely enjoyable experience, where an individual engages in any activity with total involvement, enjoyment, control, concentration and intrinsic interest.

**Enjoyment:** The most important outcome of any intrinsically motivated activity and in terms of video games is defined as the measure of how much pleasure the player derives from playing video games. The enjoyment scale is considered the self-report measure of intrinsic motivation.

**Gamification:** the use of game design elements in non-game contexts. In effect, using game principles to make tasks more appealing/enjoyable.

**Smartphone:** a phone with advanced computing capabilities that can run applications or “apps” and uses an operating system such as iOS (iPhone), Android (Google), Blackberry OS, Windows Mobile, Symbian, Palm / HP OS, or similar.

**Mobile Application (App):** The software easily downloaded to smartphones and tablets through providers such as Apple IOS or Google Play that allows consumers add functionality to their device.

**Freemium:** A model of business common in software or mobile apps where an initial version of the product is free and subsequent payable options to upgrade the product provide the main revenue source.

**Usage:** A measure of how often a consumer utilises a particular form of entertainment. Most often it is self reported in how frequently or for how long a medium like video game is played. While commonly used in the relevant literature, recent research demonstrates that self reported usage is a flawed measure.

## **1.10 The Structure of the Thesis**

Chapter one introduces the background to the thesis including the current state of the mobile gaming market and projected value. Also stated are the major objectives, relevant research questions, the rationale and potential contribution of this thesis. The remainder of the thesis will be structured as follows.

Chapter two discusses the literature related to motivation and video games in general. Various conceptual frameworks are discussed in relation to their suitability to examine the intrinsic

motivations related to mobile video games. Emanating from past literature, a conceptual model is developed and introduced based on the theory of Self Determination. The conceptual model provides a theoretical framework for assessing the influence of various drivers of enjoyment of smartphone games. In this thesis, the base drivers of enjoyment are identified as the satisfaction of the intrinsic needs for competence, autonomy and relatedness. Three further constructs of flow, social escapism and competition are identified as being specific to smartphone gaming as well as having theoretical links to the needs identified previously. Each construct is discussed in detail. Further characteristics of players in terms of age, gender and the trait of playfulness are also identified as being potentially influential on the enjoyment of smartphone gaming. This chapter also identifies enjoyment as being the key dependent variable given the contextual usage influences of smartphone gaming as well as the inadequacy of usage as a dependent variable. Nine hypotheses are proposed. The chapter concludes by identifying a conceptual model to be used in order to test these hypotheses.

Chapter three introduces and discusses an appropriate methodology with which to investigate the enjoyment of smartphone gaming. The scales proposed for use in the model are identified and adapted for use. The theoretical foundations of exploratory factor analysis, confirmatory factor analysis and regression are discussed to provide a basis of understanding the approach. This chapter also incorporates descriptions of the data collecting instruments. Chapter three concludes by demonstrating the suitability of the measurement instruments and the analyses to research questions postulating the influence on enjoyment of smartphone games.

In Chapter four, the proposed hypotheses developed from the conceptual model are tested empirically using both descriptive and inferential statistics. The results of research are presented in chapter five.



Chapter five presents the results of the descriptive analysis to provide an understanding of the typical smartphone gamer. The results of the EFA, CFA and regression analysis are analyzed and discussed. Contributions of the thesis and directions for future research are identified.

## **Chapter 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews the main body of literature pertaining to the fundamental purpose of the research. The purpose of a literature review is to both integrate and critique what others have done previously in order to identify the central issues and build bridges between topics. It can consist of numerous different focuses, approaches, goals and perspectives (Cooper 1998). The conceptual relevance of different operations may result in unanticipated elements of the domain being encountered and incorporated into the research process (Cooper 1998). The literature review of this thesis allows an examination of the relevant works to guide the outcomes of the review and shape the conceptual model.

Firstly this chapter examines the concept of play itself in order to offer a salient theoretical starting point for an examination of the act of playing games on a smartphone. As a result of this, play is identified as being intrinsically motivated, frequently repeated and attractive for its hedonic qualities and opportunities for escape from daily life. The specific context of mobile gaming is investigated in order to establish the key considerations regarding the context and opportunities for future research. This reinforces the act of playing games on a mobile device as being of play. Following this, the literature concerning video games and motivation, is examined to illuminate past findings and previous approaches.

The second section critically examines the body of literature surrounding various models of media choice and entertainment in order to identify an academically rigorous theory that can further understanding of intrinsic motivation and video games.

As a result of the review of models of entertainment choice, Self Determination Theory is identified as the most salient theory for beginning an examination of intrinsic motivations in this context and is examined in detail. This is due to the fact that SDT is an established theory of intrinsic motivation that has been successfully applied, tested and validated across a diverse range of interests. It has also been examined in terms of video game research and a specific set of scales; Player Experience of Need Satisfaction (PENS) has been developed. SDT and the PENS scales have not been previously examined in a context such as smartphone gaming and as a result, provide an opportunity for the development of new insights that can further understanding of intrinsic motivation and mobile consumption.

In order to further understanding of the context the literature is investigated for alternate constructs that can add more conceptual impetus to this research. It is taken into account that SDT posits that three basic needs; The Need for Competence, Autonomy and Relatedness fulfil wellbeing and drive enjoyment in life and video games. As a result three further constructs are identified as being related to the needs in SDT, yet remaining apart as intrinsically motivated constructs that have relevance to the context.

The experience of Flow as an important element of intrinsic motivation and video gaming has yet to be examined in terms of smartphone or mobile gaming. Competition is also identified as an intrinsically based driver of video game play also yet to be examined in this particular context. Finally, Social Escapism, an intrinsically motivated construct that has been previously established and examined in terms of internet use, is deemed as relevant to the context. These constructs are chosen as appropriate drivers that can offer support to the research questions posed in this thesis and reconcile with the concept of play.

Finally, Enjoyment is established as the relevant independent variable of this thesis and potentially relevant player characteristics are sought, in order allow for an integrated causal model that takes into account the psychology of play as advocated by Vorderer et al. (2006). Subsequently, player characteristics of gender, age and playfulness are proposed as relevant to this research.

To further understand the approach of this chapter it is important to acknowledge certain theoretical points. Abraham Maslow (1948) introduced us to a set of five basic needs that give a reason for acting or behaving in particular ways in what he deemed a theory of human motivation. As a psychological construct, motivations to fulfil such needs, as Maslow hypothesised, can be used to explain both the energised and directive aspects of human behaviour. Deci and Ryan (2000) offer a more refined view of this concept, that reinforces the position of this thesis, in that ‘although variously defined at the physiological or psychological levels and as innate or learned, the concept of needs specified the content of motivation and provided a substantive basis for the energization and direction of action’ (p. 227). In effect, the pursuit of the satisfaction of perceived needs is what drives and directs motivation.

The argument that ‘uniting work in the psychology of intrinsic motivation, the cognitive analysis of fiction-based forms of entertainment, and the evolutionary and developmental psychology of play, provides an integrated causal model for the study of entertainment’ (Vorderer, Steen & Chan 2006, p. 14) provides an illustration of how combining elements from different theoretical areas may be of benefit when developing a model to explain entertainment such as video gaming. It also posits that incorporating elements of the psychology of play can be of benefit to fully understanding facets of entertainment. Re-enforcing this position, Sherry (2004b) argues that the entire field of media research was biased against any acknowledgment of evolutionary or biological influences from its inception as a science, and as a result early theories were

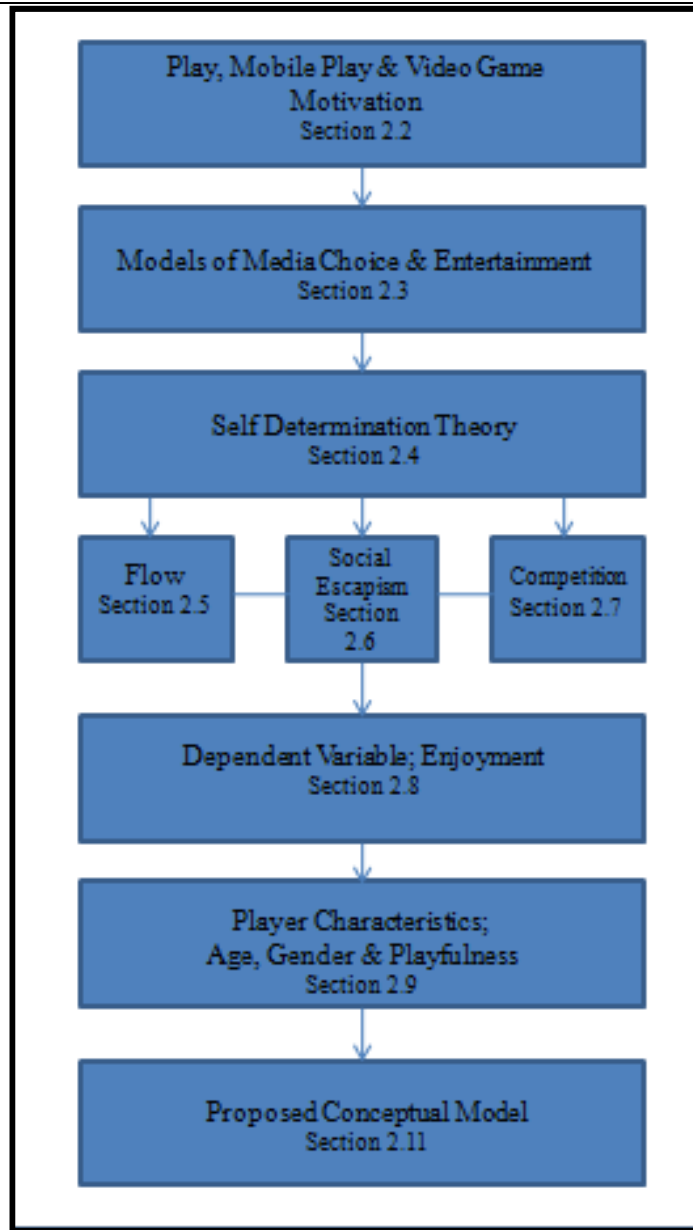
incomplete. Sherry's ideas point towards media and associated research incorporating more aspects of the biological and psychological nature of man in order to enrich long standing theories surrounding media.

Previous models to explain the intention to use various mobile services combined elements of uses and gratification research, information system research and domestication research (Nysveen et al. 2006, Revels et al. 2010). Liang and Yeh (2010) combined elements of the Technology Acceptance Model and the Theory of Reasoned Action in order to examine contextual influences on mobile play while Shankar and Balasubramanian (2009) provided a strong argument for an integration of varied theoretical perspectives in terms of mobile research.

As a result of these examples and arguments, source material for this chapter has been garnered from many different and diverse avenues of research including; psychology, business, marketing, technology, consumer behaviour, games studies, communication research, health, education, anthropology and sociology.

As a result of the literature review undertaken in this chapter a conceptual model and nine hypotheses are proposed for examination. Accordingly the literature review is represented as arranged as in figure 2.1.

**Fig 2.1 Literature Review**



### **2.1.2 Overview of the constructs established in the literature review**

Table 2.1 summarises the key constructs identified in the literature review.

**Table 2.1 Overview of the constructs**

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 influencing 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.

## 2.2 Play, Mobile Gaming & Video Game Motivation

### 2.2.1 Play

In examining the motivations to play, or indeed consume, games on a mobile device it is important to step back and examine the concept of play in itself. Video *games* are inherently referred to as 'played' throughout the literature. The consumers are referred to as players (e.g.,

Yee 2006) or gamers (e.g., Prugsamtaz et al. 2010) and all types of video games are *played* (Juul 2012). Traditional play and video gaming are both activities that translate beyond the various form and result in similar manners of behaving and outcomes of emotion (Brougère 1999).

When taking the objectivist view, play can be seen as an inherent evolutionary trait common among animals and humans alike. Huizinga (1938) in his seminal work ‘Homo Ludens’ identifies play as one of the most important evolutionary tools and positions it as the framing device for the subsequent evolution of man, language, culture and modern day civilisation. Play in modern day culture can be seen as an inherently intrinsically motivated experience through leisure activities (Ungera & Kernan 1983), sports (Mihalich 1982), hobbies (Bloch & Bruce 1984), creativity (Hirschman 1983), games (Huizinga 1938) and even as a consumption experience (Holbrook, Chestnut, Oliva & Greenleaf 1984). The ‘relationship to pleasure, with its intrinsic motivation, is the most interesting characteristic of play; that is to say that behaviour so complex and rich in possibilities is carried out only because the subject finds pleasure in it without it being directly linked to the restrictions of daily life’ (Brougère 1999, p. 139).

There remains a certain level of abstruseness on the concept of play as Sutton-Smith (2001) acknowledges in ‘The Ambiguity of Play’. Sutton-Smith (2001) points to a myriad of divergent theories on what play actually is but realizes the research implications of such a quandary is the necessity to examine in detail various aspects of play in order to improve our understanding of the concept as a whole. Through the detailed examination of intrinsic motivation and mobile play, this thesis can add to the knowledge path of the understanding of the concept of play.

Oerder (1999) in his research on the psychology of play identified three major characteristics of play;

- That it is intrinsically motivated and highly attractive,



- It implies a change in perceived reality
- That it is frequently repeated.

Vorderer (2000) took Oerder's research and applied it to the psychology of entertainment, proposing the 'psychological theory of playful action'. Vorderer (2000, 2001) proposes this theory as a useful framework to describe and explain interactive entertainment, stating that most forms of entertainment can be seen as play given that most forms satisfy Oerder's defined characteristics.

While Oerder (1999) identified these characteristics of play for children as essentially a coping mechanism for their lives, he applied it to adults through their needs for religion, art and even work as a follow up phenomena of play that potentially serves the same functions. Oerder dismisses the need of adults for play as an escape from reality, identifying day dreaming, fantasies and the social realities of real life as providing enough outlets for adults to cope without recourse to play.

However both the success of the video game industry (Alpert 2007), the various identified motivations of play (Kallio, Mayra & Kaipainen 2010, Klug & Schell 2006) and research on play from an evolutionary standpoint (Ohler & Nieding 2006) provide enough counterpoints to this theory that Vorderer's theory of playful action can be seen as a plausible path towards conceptualising entertainment, in particular interactive entertainment such as video games. Vorderer's (2000) theory is that all media use is a form of play that helps consumers to cope with life. It's intrinsically motivated, repeated frequently and allows one to escape from reality. This framework should be specifically useful concerning video game play (Vorder, Hartmann & Klimmt 2003) and as a result reinforces the position of this thesis in conceptualizing smartphone play as intrinsically motivating.

According to Ermi and Mäyrä (2005) the act of playing a game leads to its program code having an effect on cultural, social, artistic and commercial realities. Players do not just engage in the gameplay but actively shape their own experiences within the game. ‘If we want to understand what a game is, we need to understand what happens in the act of playing, and we need to understand the player’ (Ermi & Mäyrä 2005 p1). This research intends to conceptualise play as an intrinsically motivated experience that is attractive for its hedonic qualities. This offers justification for the choice of SDT as a theoretical framing device and enjoyment as the dependent variable.

Play remains an underrepresented phenomenon throughout the academic literature. ‘What other aspects of human behavior (other than play) are so common, so universal, so pervasive, so profound, and so critical to an understanding of human nature, well-being, and self-consciousness—yet studied so seldom’ (Myers 2006, p. 49)? Play traditionally remains a difficult phenomenon to understand (Sutton-Smith 2001, Piaget 2013) yet this thesis offers a starting point, rooted in an emerging and dynamic context, which can allow a discourse on play through the examination of the intrinsic motivations that drive it.

### **2.2.2 Mobile Gaming**

The defining characteristics of mobile games according to the literature are in “accessibility”, due to being ever present on a person (Hjorth & Richardson, 2009, Kleijnen et al 2002, Maddell & Muncer 2007, Soh & Tan 2008), use as entertainment to fill empty time or idle moments (Sotimaa 2002, Li & Counts 2007, James 2001, Hjorth & Richardson 2009) and as a socially connected device (Hjorth 2011, Casey, Kirman & Rowland 2007). James (2001) identifies a distinct advantage that mobiles have over more traditional fixed gaming vehicles such as computers or consoles, in that previously ‘entertainment-impooverished’ situations can now be

utilised for gaming. This is potentially a tremendous advantage in terms of potential revenue generation since as for millions of consumers their mobile device will be how they primarily occupy dead time.

Sotimaa (2002) describes the first phase of mobile gaming as the 'entertainment of idle moments' where the stereotypical mobile gamer is playing while waiting for a friend or on public transport, attributing this to the fact that most people who own one carry it with them at all times. Hjorth and Richardson (2009) investigated the where and why of casual mobile gaming. Their results found a number of contexts for mobile phone game play—'waiting', 'boredom', 'time-filling', and 'switching off'—each of which describes a form of delay or putting 'on-hold'; that is, not 'telepresent' but rather co-present or co-proximate distraction when with unfamiliar others, or otherwise a solitary 'in-the-meantime' or 'time-out' activity. This is what they found to be a form of 'Nagara', a Japanese term defined as doing something 'whilst doing something else'. Li and Counts (2007) also found that mobiles provide an excellent platform for utilising interstitial time such as waiting or travelling due the nature of mobile as being ever present on a person. 'The most obvious relative advantage of mobile services is its ubiquity, which allows consumers to engage in time-killing or stress-relieving activities anywhere and at any time' (Kleijnen et al. 2002, p. 52).

As mobile games continue to evolve, more recent literature offers a more nuanced view of the phenomenon. Chan (2008) points to the fact that a lot of portable gaming takes place in the home itself. Advances in technology, such as the iPhone with its touch screen and motion sensing, has led to games that can 'demand a non-casual multi-sensory engagement, perhaps more akin to the stickiness of console' (Richardson 2011, p. 423). Yet conversely, many casual mobile games are still characterised by simple rules and a substantially lower barrier to entry in terms of time and skill (Richardson 2011). Yet these modern developments can challenge the perception of mobile

games as predominantly casual and used for time filling, as the advanced capabilities such as internet connectivity and open operating system mark a significant shift away from traditional 'phonic' functionalities and more towards a device that offers itself as a 'conduit and container of numerous playful and often user generated applications' (Richardson 2011, p. 428) as well as various other modes of connectivity.

The fact that the mobile remains at heart a socially connected communication device means that the potential for multiplayer games remains vast. Soh and Tan (2008) identifying the potential for global multiplayer gaming as well as localized multiplayer games on mobile devices while Li and Counts (2007) identify mobile game play as fostering a feeling of community among players. Kim (2013) suggests that many of the more successful mobile games allow for social interactions.

Essentially the mobile gaming arena remains one in flux due to the advancement and diffusion of technology and games themselves. While the most common definition of mobile gaming remains as a casual time filler, recent advancements and the normalisation of constant smartphone use indicates that that it is becoming more. Yet core values of mobile gaming remain 'as an enjoyable way to kill time, valued especially for its ubiquitous availability and its instant entertainment for short time episodes' (Engl & Nache 2012, p. 85). Liu and Li (2011) identify that there is a utilitarian aspect of hedonic mobile gaming in this context, in that gaming serves a utilitarian purpose of distraction through enjoyment.

While the core values of mobile gaming can be seen as an intrinsically motivated choice, that while subject to various extrinsic influences such as forced waiting, remains a choice of consumption that is personally directed. In particular mobile gaming, reflecting Vorderer's Theory of Playful Action, represents a change in reality and is frequently repeated.

While exploratory research of these characteristics of mobile games would appear redundant at this point, it remains important to acknowledge and explore this area within this thesis to validate and discuss any potential findings. Table 2.2 summaries these characteristics.

**Table 2.2 Characteristics of Mobile Play**

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Current Characteristics of Mobile Video Game Play
Always accessible
Played anywhere
Casual Play or Serious Play
Low barriers in terms of skill and time for adoption
Use as time filler or distraction
Advanced technological capabilities resembling traditional console video game play
Cheap accessible games available as Apps
Connectivity device that allows connection with others.

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### **2.2.3 Previous studies of Motivation in Video Games**

There is a wide and growing body of literature concerning motivation in the context of interactive media such as video games. This section seeks to briefly outline how motivation has been conceptualized and considered in terms of the phenomenon.

To be motivated is to be moved to do something and, ‘its most basic distinction is between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome’ (Ryan & Deci 2000, p. 55). In line with Oerder’s (1999) definition of play, this research will examine motivation for play on smartphone games in terms of intrinsic drivers of enjoyment. Motivation differs between people in the level of motivation people have and also in the orientation of that motivation. The orientation of motivation concerns the underlying attitudes and goals that give rise to actions, in essence the why of actions (Ryan & Deci 2000). In terms of video games and their use on smartphones we need to ask what motivates people to play

them. Ryan et al. (2006) have stated that it is clear that that video games have tremendous appeal and that players are highly motivated to engage in these simulated environments.

Bartle's (1996) player types for the genre of Massive Multiplayer Online Role Playing Games (MMORPG) have formed the basis for player segmentation and motivations for play within the games industry and early academic literature. These types of game are one in which player's control a character or avatar set in some form of fantasy world. Players can interact and play with other players online either co-operatively or in competition. The 'world' in which games are situated provide; challenges, missions and quests for players that allow them to level up (improve) their character in order to become equipped to face greater challenges. Bartle's work is frequently identified as the seminal work that informed subsequent research.

Bartle identified four main types of player, Killers, Achievers, Explorers and Socialisers, each type explicitly reflecting what the various players primarily like to do within the game. Yee (2006) used a factor analysis approach to examine these player types as motivations of play from a survey of 3200 respondents. Yee concluded that players couldn't be identified as a single type on the basis of Bartle's work but that instead there are three key motivations of achievement, social and immersion, further divided into 10 motivational subcomponents. These motivations are not exclusive and instead form a complex pattern of interconnected motivations. Limitations of this work lie in the fact that it relates exclusively to MMORPGs such as World of Warcraft yet importantly it reveals that there are a lot of varied and complex interwoven reasons to play.

Kallio et al. (2010) have extended the scope of player motivation studies beyond specific game genres and instead offer 'a more comprehensive theory of play and players in which digital play is understood to be framed and situated in culturally specific everyday realities' (p. 6). They identify the motivations behind the modern gamer as divided into several gaming mentality

heuristics that in turn can be influenced by the context surrounding them. There are three overarching main mentalities, social, casual and committed. The social mentality can be broken down further into gaming with mates, kids or gaming for company. The casual mentality can be broken down into killing time, filling gaps or relaxing and the committed mentality can be broken down into having fun, entertaining and immersing.

They suggest that that ‘it is apparent that the mainstream of digital gaming is not formed by the casual gamers who only play to kill time, nor is it populated by their opposites, the committed game hobbyists. It is rather the fluid continuity of different people who play to relax, socialize, have fun and entertain themselves who form the majority of the digital gaming culture and who provide the backbone for the emerging ludic society at the moment. This view is related to a particular view of the future, based on the perception of how digital play has already entered the process of becoming an age-independent, everyday practice that probably will not soon differ at all from other commonly accepted and adapted free-time activities’ (Kallio et al. 2010, p. 21). Here it is again apparent that a multitude of motivational factors influence gaming according to the person or context.

Klug and Schell (2006) offer an industry perspective that gives several motivations for play such as; structured competition, vicarious experiences through games, exploring fantasy relationships safely and control of their environment.

Video games remain a complex area of motivational studies with the literature, continuing to broaden as deeper and more specific areas of interest are identified and investigated. What is clear is that there are a multitude of approaches to understanding a complex paradigm of motivation surrounding video games and that there has been a clear evolution of the context and

the theories surrounding it. Video gaming has moved on from being identifiable as a specific activity performed by a clearly identifiable segment of the population.

It is the sheer diversity of motivations established in this section that means as a starting point for this research, a previously established theory will provide a framework that can be adapted according to what the literature tells us about mobile gaming. As Rigby (2004) argued, a true theory of motivation should not be constrained by the various genres, types and platforms for games, but instead should focus on the inherent motivations that exist within humans, the factors that address our inherent psychological needs. This is reinforced by Kallio et al. (2010) in that now many different people play for many different reasons.

Taking this into account, this research seeks to identify a relevant and current theoretical model that can form the basis of the conceptual model identified in this research, taking into account the preceding arguments.

### **2.3 Models of Media Choice & Entertainment**

This section investigates several established theories of media use and enjoyment that could potentially provide a starting point for the conceptual underpinnings of this thesis. Given that one of the purposes of a literature review is to construct definitions that distinguish relevant from irrelevant studies (Cooper 1998) this section serves a function through demonstrating why Self Determination Theory is more relevant than the following theories examined. As a result this section highlights why the following theories were not deemed appropriate and provides a background context to highlight why Self Determination Theory was chosen. A more in-depth review of this section is available in Appendix 1.8.



### **2.3.1 Action Theories; Theory of Planned Behaviour and Technology Acceptance Model**

The Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) have both received attention in the literature. Both models are adapted from the Theory of Reasoned Action (TRA, Fishbein & Ajzen 1975), which suggests that a person's behavioural intention depends on the person's attitude towards the behaviour in question and subjective norms, the perceptions of others. TAM is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (Venkatesh & Davies 2000). Chutter (2009) concluded that research in TAM lacked sufficient rigor and relevance to make it a relevant theory for Information Systems (IS) research while Bagozzi (2007) found that the TAM model was not suitable to explain or predict system use.

TAM has been used with extensions of the model to explain why people play online games (Hsu & Lu 2004) and the *adoption* of mobile games (Ha, Yoon & Choi 2007). Prugsamatz, Lowe and Alpert (2010) utilised TPB to model consumer entertainment software choice and the theory was extended by Lee (2009) to understanding the behavioural intention to play online games. The importance of the flow experience and enjoyment established by Lee, provide support for the use of these constructs in this research. This study finds that both TAM and TPB do not offer comprehensive models in terms of understanding intrinsic motivation, and although elements of the theories are useful in terms of explaining elements of video games, overall they are limited in providing a framework to understand mobile gaming and intrinsic motivation.

### **2.3.2 Uses and Gratifications as Media Choice**

Blumler and Katz' (1974) Uses and Gratification Theory (UGT) suggested that media users play an active role in their choice and use of media. The users are goal orientated in selecting a media that will satisfy their needs and result in gratification. Uses and Gratifications theory focuses on media use and assumes users to be active, purposeful and selective in their choice of media, allowing examination of the motivations behind the choice and use of media (Krcmar & Strizhakova 2009).

Criticisms of UGT are fairly common according to Rubin (2002), and Krcmar and Strzhakova (2009). These include researchers attaching different values to the UGT constructs depending on the context being investigated and even a lack of conceptual clarity in the concepts themselves. The treatment of the audience as being too actively rational in judging their behaviour and the reliance on the methodology of self-report has also been extensively criticised. Strzhakova and Krcmar (2003) question whether viewers actually have access to their viewing motives while Nabi, Stitt, Halford and Finnerty (2006) suggest that audiences are not as active in their media choices as the UGTs literature suggests. Finally a problem exists in that many media use typologies that exist for each individual media can't be shared at a broader level due to the various motives behind each medium, restricting UGT as a meaningful approach (Krcmar & Strizhakova 2009).

In terms of video games, UGT has been examined in the context of social networking games (Hou 2011) and as a predictor of video game use and preferences (Sherry, Greenberg, Lucas & Lachlan 2006). Indeed this study, while not utilising UGT as a framing theory, utilises elements of past work to complete the conceptual model. The competition construct utilised as part of the conceptual model was adapted from Greenberg et al. (2010) who examined video games from

the background of the UGT perspective and is discussed later in this thesis. The previous criticisms of the theory established here and that it fails to fully reflect the earlier definitions of play guiding this research means that Uses' and Gratifications does not provide the optimal starting point for exploring the research questions posed in this research.

### **2.3.3 Selective Exposure and Mood Management**

Selective exposure theory (Festinger 1957) and mood management theory (Zillmann 1988) are two linked theories that can offer some explanation towards the motivation behind media choice and by extension, video games. Festinger's (1957) theory of selective exposure is based on the assumption that individuals will avoid media or entertainment that they feel will create dissonance and instead will exercise autonomy in their media choices and filter what they are exposed to. Zillmann (1988) extends this theory to posit that individuals select different types of media entertainment in order to regulate their moods. Individuals will arrange internal and external stimulus conditions in order to minimise negative moods and maximise or enhance good moods. A large part of mood management has been conducted experimentally (Knobloch & Westerwick 2006) as investigating mood management via surveys can be problematic due to lay rationalisations and the social desirability of certain responses are likely to bias self-reports (Zillmann1985).

Elements of selective exposure and mood management have been examined theoretically in the context of video games (Vorderer, Hartmann & Klimmt 2003, Bryant & Davies 2006, Olson 2010) and in controlled studies (Bowman 2010, Chen & Raney 2009). Crucially 'Disposition theories, like mood management, are difficult to apply to video and computer games' (Vorderer, Bryant, Pieper & Weber 2006, p. 4) due to the distinction between passive media such as TV and interactive media such as video games. It is difficult to explain the process of enjoyment that

users feel as they play a game as the game may not turn out as originally intended due to its interactive and subsequently unpredictable outcome. (Bryant & Davies 2006) However Bowman (2010) argues that video games, due to their interactivity and subsequently higher involvement, have a greater potential for mood repair than traditional media forms.

Mood management also has parallels to Vorderer's (2000) theory of playful action in that it is intrinsically motivated and attractive due to its potential in creating arousal in the player, a change in reality will affect moods and that it can be assumed to be frequently repeated, as experience with a game will allow a player to understand the impact it will have on their mood. While mood management does not form the basis of this thesis, elements of the theory inform aspects of this study. Social Escapism (Korgaonkar & Wolin 1999), utilised in this thesis, can be seen to reflect elements of mood management and is discussed in detail later.

### **2.3.4 Social Cognitive Theories**

Social Cognitive Theory (SCT, Bandura, 1989) is based on Bandura's (1977) interpretation of Social Learning Theory. SCT is described by Bandura (1989) as reciprocal, casual relationships among the environment, individuals and their behaviour. In other words, new behaviours are not learned solely by people attempting them but rather as a combination of this, observing others and the environment they are in. In effect, cognitive schemas arise from a combination of direct and observational learning.

Eccles and Wigfield (2002) characterize SCT as an expectancy theory; that is behaviour is guided by expectations regarding outcomes. The main components of SCT can be seen as outcome expectations, self-efficacy and self-regulation (LaRose 2009) and the theory has been quite successfully applied in investigating media choice and usage (LaRose & Easton 2004).SCT can be seen as particularly useful in explaining the adoption of new technologies due to observed

behaviour of others (Bandura 2001, Rogers 1995). ‘Recent research provides preliminary evidence of (SCT)’s superiority to one of the leading paradigms of media choice, UGs, and it also fills important conceptual gaps in TPB’ (La Rose 2009, p. 27). SCT does not satisfy the criteria of a theory of intrinsic motivation and can be seen as conceptually inferior to the following theory (SDT) in terms of the definition of play identified in this research.

## **2.4 Self Determination Theory**

Self Determination Theory (SDT) proposed by Deci and Ryan (1985) is a theory of human motivation that offers a suitable framework for examining entertainment (Vorderer, Steen & Chan 2006). It fulfils the criteria of being of intrinsic motivation and offering an understanding of why an activity offers an escape from perceived reality and is frequently repeated. At the core of the theory is the fact that three innate psychological needs; The Need for Competence, The Need for Autonomy and The Need for Relatedness, inherent to everyone.

The pursuit of satisfaction of these needs is what is considered the motivational drive. When an individual satisfies these needs in any particular role or activity then this leads to optimal intrinsic motivation within the context. Satisfaction of these needs will lead to greater enjoyment, well being and increased motivation to continue in any role or activity.

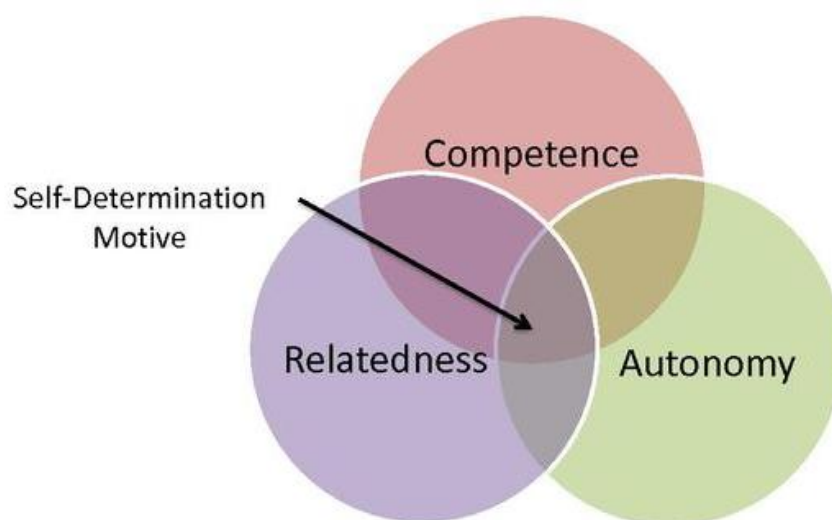
SDT has been used and examined in the context of video games. A scale, the Player Experience of Need Satisfaction (PENS) has been developed and empirically validated for video games, utilising SDT as the underlying theory. Crucially, this scale has yet to be examined in terms of mobile play such as smartphone games, and can offer new insights into the intrinsic motivations of this particular context.

In order to fully justify SDT as the theoretical underpinning of this thesis, section 2.4.1 offers an in-depth analysis of the conceptual underpinnings of the theory while section 2.4.2 explores the use of SDT in the context of video games. Figure 2.2 offers a summary of the theory.

**Fig 2.2 Self Determination Theory**

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### Three Innate Psychological Needs Comprise The Self-Determination Theory of Student Motivation



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Source: Deci & Ryan (2000).

#### **2.4.1 Background and conceptual underpinnings of the theory**

Self Determination Theory (Deci & Ryan 1985) proposes a multidimensional conceptualization of motivation that is based on the distinction between intrinsic and extrinsic motivation. Deci & Ryan (1985) argue that for optimal performance at any given task or occupation, internalisation of extrinsic influences as intrinsic motivation will produce the best outcome. Intrinsic motivation refers to doing something because it is inherently interesting, enjoyable or of value to the individual while extrinsic motivation refers to doing something because it leads to a separable outcome (Ryan & Deci, 2000a). An intrinsically motivated person is moved to act for the fun or

challenge entailed in the act rather than due to external pressures, rewards or sanctions. SDT has been successfully applied to video games (Ryan, Rigby & Przybylski 2006, Chiang & Lin 2010, Przybylski, Rigby & Ryan 2010) and is discussed in greater detail in section 2.4.2.

Deci and Ryan (1985) acknowledge that humans from birth when in their healthiest state are driven to be active, curious and playful creatures that display a ubiquitous tendency to learn and explore. This is a natural motivational tendency that extends beyond childhood and allows us to extend both our skills and knowledge through an inclination to take an interest in novelty and apply our skills. It is a significant feature of human nature that affects performance, persistence, and well-being across life's epochs. SDT focuses on the degree to which an individual's behaviour is self-motivated and self-determined.

One mini theory (a theory offering greater understanding of the SDT theory as a whole) within SDT, Basic Psychological Need theory (BNP) posits that there are three inherent needs within every individual of competence, autonomy and relatedness that once satisfied lead to greater well-being. Another theory within SDT, Cognitive Evaluation Theory (CET, Deci & Ryan 1985) had the aim of specifying factors that explain variability in intrinsic motivation. CET focused on the three inherent needs within the individual of competence, autonomy and relatedness. When these three needs are satisfied it leads to optimal intrinsic motivation. BNP and CET form the basis of Self Determination Theory and have subsequently been subsumed into the literature as SDT theory itself. Self Determination Theory is a complex theory but can also be seen as a relatively simple concept in that at its root, is the satisfaction of these three needs.

Vansteenkiste, Niemiec and Soenens (2010) provide an overview of SDT and how historically five mini theories inform the basis of the entire phenomenon. As well as BNP and CET, there are three other theories that drive SDT. Organismic integration theory concerns how extrinsic

motivations can be internalized as intrinsic motivation and thus still lead to positive outcomes. Causality orientations theory concerns itself with personality types and how individuals orient to an environment and regulate their various behaviours according to how self determined they are. Finally, Goal Content Theory situates the needs established in SDT in terms of life and long term goals as outcomes. Vansteenkiste et al. (2010) hoped to ‘provide a source of inspiration for scholars to further develop SDT, thereby fitting their own piece into the SDT puzzle’ (p. 153). The three basic needs of competence, autonomy and relatedness established in BNP and CET have come to define the basic tenants of SDT in every arena, including as illustrated further on, in video gaming. Table 2.3 offers a brief summary of the five theories relevant to SDT.

**Table 2.3 Summary of Self Determination Theory**

Basic Psychological Needs	Psychological well-being and optimal functioning is predicated on the satisfaction of the needs for competence, autonomy, and relatedness.
Cognitive Evaluation Theory	Highlights the role of these needs in the fostering of intrinsic motivation
Causality Orientations Theory	How personality types and how individuals orient to an environment and regulate their various behaviours according to how self determined they are.
Organismic Integration Theory	concerns how extrinsic motivations can be internalized as intrinsic motivation
Goal Contents Theory	the distinctions between intrinsic and extrinsic goals and their impact on motivation and wellness.

**Source: Based on Deci & Ryan (1985), Deci & Ryan (2000), Ryan & Deci (2000a).**

The primary concern throughout the research on SDT has been the well-being of individuals, whether they are students in classrooms (Miserandino 1996), patients in clinics (Ryan, Plant & O'Malley 1995), athletes on the playing field (Frederick & Ryan 1995), or employees in the workplace (Sheldon, Reis & Ryan 1996). However the theory is not limited in how it can be applied.



Vorderer, Steen and Chan (2006) used SDT to suggest that people's overall interest in entertainment is due to the fact that the use of entertainment media products, provide specific solutions to the needs of autonomy, competence and relatedness. Firstly, due to entertainment being a choice, they identified that it could be categorised as intrinsically motivated. We can choose the degree of difficulty we require in our entertainment choices and satisfy our need for competence. We can watch a complex documentary or a less demanding comedy. We satisfy our need for autonomy in that we make this choice. If the choice is someone else's we may not enjoy it as much. Finally we can satisfy our need for relatedness through with whom we experience the entertainment itself with or even through characters on a screen or in a book.

These insights can be seen directly reflected in video games. In terms of the Need for Competence, players can choose the difficulty level of a game to reflect their current needs. Players can choose which specific game or type of game they want to play according how much of a challenge they require. Players also experience autonomy in this choice of game yet within game they can also experience autonomy through the choices, decisions and options they make or take within a game. The Need for Relatedness can be experienced through playing with others or identification with the characters they control and interact with in game. Yet these aspects of SDT remain unexplored in terms of the intrinsic motivations for mobile games. Mobile and smartphone games have characteristics, such as being used as a distraction in appropriate contexts, which may separate the concept from traditional video game play (play situated on a PC or console and TV). Do these needs explain the intrinsic motivations of mobile games or are these concepts rooted in more traditional settings of video game play? Does mobile play allow satisfaction of competence, autonomy and relatedness? For example does the characteristic of smartphones as a socially connected device allow for players to feel connected to others through play?

In terms of motivational theories, Deci and Ryan (1985) adopt the position of the organismic theory, which assumes the organism (individual) initiates behaviours in order to satisfy intrinsic needs and physiological drives. Deci and Ryan (2000) suggest that while SDT may not have relevance with the early developmental play of children it does become more important for play later on. This position adds support to the position of this thesis in that play should be understood from the evolutionary and developmental psychology of play. The inherent intrinsic needs and physiological drives provide the energy for the individual to act on the environment, as opposed to being reactive, and to manage their drives and emotions. Deci and Ryan (1985) posit that to be truly intrinsically motivated an individual's behaviour must be free from external control, in effect self-determined. 'Self-determination is a quality of human functioning that involves the experience of choice, in other words, the experience of an internal perceived locus of causality' (Deci & Ryan, 1985, p. 38).

SDT focuses on the degree to which an individual's behaviour is self-motivated and self-determined. Ryan and Deci (2000a) articulate the basic differences between intrinsic and extrinsic motivation in terms of SDT, in terms of intrinsic motivation as being doing something because the individual basically enjoys it while extrinsic motivation is doing something because it leads to a separable outcome. Ryan and Deci (2000a) further illuminate by stating that it is critical to remember that intrinsic motivation occurs only for activities that hold an intrinsic interest in terms of having an appeal for the individual such as novelty, challenge or aesthetic value. 'Self-Determination Theory is specifically framed in terms of social and environmental factors that facilitate versus undermine intrinsic motivation' (Ryan & Deci 2000a p58). Self-determination is a quality of human functioning that revolves around the experience of choice, when self-determined one acts out of choice rather than coercion or obligation to others (Deci & Ryan 1985). This further emphasises the appropriateness of the theory for examining autonomous

choice of playing games on a mobile. Mobile games fundamentally remain a choice from choice of phone, choice of game and choice of when to play.

Central to self-determination theory is the concept and theory of basic psychological needs (BPN) that are assumed universal to everyone. According to BPN theory, these needs--the needs for competence, autonomy, and relatedness--must be satisfied in order for people to encounter well-being in their lives (Deci & Ryan 2000). Cognitive Evaluation Theory (CET, Deci & Ryan 1985) had the aim of specifying factors that explain variability in intrinsic motivation. CET is based on the shift in the locus of control that occurs when behaviour moves from being self-determined and intrinsically motivated towards being extrinsically motivated through external rewards or controls. CET also focuses on the three inherent needs within the individual of competence, autonomy and relatedness. When these three needs are satisfied it leads to optimal intrinsic motivation. 'Three innate psychological needs – competence, autonomy and relatedness – which when satisfied yield enhanced self-motivation and mental health and, when thwarted, lead to diminished motivation and well-being' (Ryan & Deci 2000b, p. 68).

CET was formulated to integrate results from initial laboratory experiments on the effects of external events on intrinsic motivation and has been subsequently been tested and extended by many field studies set in various settings (Ryan & Deci 2000b). The principals of CET only hold true for intrinsically motivated pursuits and Ryan and Deci (2000b) summarise this framework by suggesting that social environments can facilitate or forestall intrinsic motivation through either supporting or denying the three basic psychological needs suggested by the theory. The mobile context and smartphone games has yet to be examined in terms of the facilitation or otherwise of these needs but as an intrinsically motivated pursuit would appear a suitable avenue of enquiry.

Firstly CET argues that interpersonal events and structures, such as feedback or rewards, lead to feelings of competence through action and in effect enhance intrinsic motivation for an action or task. This is due to the satisfaction of a basic psychological Need for Competence. Ryan and Deci (2000a) predict that optimal challenges or feedback from effectance (having an influence on an environment) will facilitate intrinsic motivation. But CET specifies that competence alone will not enhance intrinsic motivation unless the individual also feels autonomous in the task, that the task is accompanied by an internal perceived locus of causality (Ryan & Deci 2000a). Choice and opportunities for self-direction will enhance intrinsic motivation because they allow a greater feeling of autonomy (Deci & Ryan, 1985). Although the satisfaction of the Needs for Competence and Autonomy are highly salient for producing variability in intrinsic motivation, a third factor, the Need for Relatedness, also has an effect (Ryan & Deci 2000b). While many intrinsically motivated behaviours are performed in isolation, the evidence points to a secure relational base being necessary for the expression of intrinsic motivation to be evident (Ryan & Deci 2000b). Socially connected devices such as smartphones, and the associated social networking capabilities, would indicate that there exist relational frameworks available to players that can support this position.

On a macro level, Przybylski et al. (2009) in researching the basic need satisfaction of SDT in video game player's lives found that high levels of basic psychological need satisfaction were related to a more harmonious and healthy pattern of video game use in players lives while lower levels of basic need satisfaction led to more addictive and unsatisfying game engagement. In effect when the principals of SDT remain salient and the needs are satisfied in life generally, video game engagement remains a healthier pursuit.

Thus, SDT offers a suitable framework for examining intrinsically motivated pursuits in terms of positive outcomes. It also offers academically well established and rigorous constructs that allow

measurement and testing of the underlying theory. The next section analyses and discusses the use of SDT as a measure of understanding the intrinsic motivations for the enjoyment of video games which can help answer the research questions posed in this thesis.

#### **2.4.2 Specific use of SDT in video games**

Self Determination Theory has been explicitly adapted and applied to video games in several studies that demonstrate the value of the theory in the context of intrinsic motivations for video game play and enjoyment. This thesis proposes examining the Needs for Competence, Autonomy and Relatedness, developed and tested as part of the Player Experience of Need Satisfaction scales (PENS, Ryan et al. 2006), as part of the conceptual model to explain intrinsic motivations for play on smartphones.

Ryan, Rigby & Przybylski (2006) sought to examine the motivational pull of video games utilising an SDT approach. The purpose of the study was two-fold, firstly to examine how an existing theory of human motivation (SDT) applied to and accounted for player motivation in the context of video games. Secondly, they investigated the short term impact of video game play on the basic psychological needs identified in CET, hypothesising that games are primarily motivating due to players experiencing satisfaction of the needs for competence, autonomy and relatedness while playing. Ryan et al. (2006) predicted that need satisfaction would explain continuing play while a lack of need satisfaction would result in a lack of inclination to play. The inclination to play was measured by examining the enjoyment of particular games. Therefore a game that satisfies the Needs for Competence, Autonomy and, where relevant, Relatedness would result in more enjoyment and an inclination to play more. Satisfaction of these needs would result in intrinsically motivated play.

Ryan et al. (2006) identified that, few formal theories of motivation had been applied to video games in order to investigate the motivations of players and the well-being outcomes of play.

Their primary starting point was built on Rigby's (2004) argument that a true theory of motivation should not be based on the structure of particular games but should instead address the factors that are associated with the enjoyment of games across different players and different genres of games. The question is what basic psychological needs and human motivational propensities are met by gaming in general? Ryan et al. (2006) articulated and empirically tested a theory-grounded approach to gaming based on the assumption that all different players seek to satisfy the same basic psychological needs through play. In order to do so they developed and employed a new measure of need satisfaction through the playing of video games, the Player Experience of Need Satisfaction (PENS), elaborated from SDT.

The PENS scales consists of five constructs designed to measure relevant outcomes. The Needs for Competence, Autonomy and Relatedness are the primary basis of the scales. Two further constructs were also developed to provide a context specific use of the scales. 'Immersion' reflected how deeply players feel they are in a game world, and is distinct from the concept of flow, in that it reflects atmosphere and story progression of a game (Naliuka et al. 2012). Screen size and game type will both result in lower levels of immersion (Naliuka et al. 2012) and as such the smartphone does not offer the optimal screen size or game experiences to reflect items such as 'Exploring the game world feels like taking an actual trip to a new place' (Ryan et al. 2006). Larger screens and games offering a more realistic in depth game experience heighten the immersion experience. Furthermore this thesis is examining general intrinsic motivations for play and Immersion remains a game specific item. Similarly, the construct of 'Intuitive Controls' can also be seen as very game specific as reflected by items such as 'When I wanted to do something

in the game, it was easy to remember the corresponding control' (Ryan et al. 2006). Both Immersion and Intuitive Controls are not indicative of motivation to play as explained further on.

In the initial testing and validation of the PENS scales (Ryan et al. 2006) four studies were carried out to test three main hypotheses. The first three studies were experimental and examined the PENS scales with individuals, post playing certain games, while the fourth study surveyed an on-line community with experience in multiplayer games. Firstly it was expected that satisfaction of the three needs within gameplay would contribute to intrinsic motivation to play, immersion in the game environment itself and short term positive shifts in player well-being. Secondly it was hypothesised that the motivational affordances provided by games are more important than the specific appeal of certain games and individual differences. This is an important consideration in the approach applied to this thesis. The third hypotheses predicted that mastery of game controls was necessary to access the satisfaction of needs but that this mastery of controls alone was not in itself motivation to play.

The results for the first hypothesis were positive in that it was suggested that the satisfaction of the three needs, competence, autonomy and relatedness contributed to motivation to play and in fact 'showed that psychologically need satisfying experiences form the root of intrinsically motivating play, and that such experiences positively influence short-term shifts in well-being and increased immersion in the game world' (Przybylski, Rigby & Ryan 2010, p. 158). The results indicated that all three needs made independent contributions to the enjoyment of, and immersion in, the game as well as future plans to play (Przybylski, Rigby & Ryan 2010).

The second hypothesis, that the motivational affordances provided by games are more important than the appeal of specific games, was examined through comparing a more popular and critically well received game against a less popular game and worse received game of the same

genre. “The more popular game had a more positive influence on short-term well-being and was more intrinsically motivating precisely because it provided experiences that were richer in autonomy and competence need satisfaction (Przybylski et al. 2010, p. 157). This provides evidence that genre and game type are less important than the satisfaction of these universal needs. The quality of the game and how it satisfies player’s needs is what is important. The third hypothesis that mastery of games controls was important in satisfying needs was demonstrated over three studies tested using the Intuitive Controls scales. Mastery of controls had an influence on enjoyment of games but ‘no longer accounted for unique variance in player motivation and well-being when in-game need satisfaction was considered’ (Przybylski et al. 2010, p. 158). This suggested that the construct of Intuitive Controls is not a motivating influence on play.

Overall the studies demonstrated that psychological need satisfaction is at the root of the intrinsic motivation to play games and that game environments can fulfil satisfaction of these needs and as a result can provide ‘a robust account for player motivation and the effects of play on wellness outcomes’ (Przybylski et al. 2010, p. 158). What is important to remember is that these results are indicative of experimental play sessions on traditional gaming devices such as consoles. These results provide a conceptual basis for examination in the context of smartphones and intrinsic motivation. It remains necessary to explicitly examine how psychological need satisfaction is satisfied through smartphone and mobile gaming.

Przybylski, Ryan and Rigby (2009) utilised the PENS scales in a series of studies examining the motivating role of violence in video games finding that violence adds little to enjoyment or motivation once the needs autonomy and competence are satisfied. Violent content was largely unrelated to need satisfaction. Over six studies, separate elements of the PENS scales were tested at various points, demonstrating that the PENS scales as a whole does not have to be used to be



used congruently. That separate aspects of the entire scales can be used in an ad-hoc pragmatic manner reinforces the approach adopted in this thesis.

Przybylski et al. (2010) summarise their works on video game motivation and Self Determination theory through advocating a theory-based motivational model for examining and evaluating the ways by which video game engagement shapes psychological processes and influences well-being. Their ‘evidence suggests that the broad appeal of games is based on the psychological need satisfaction play can provide, that these motivational processes are robust predictors over and above differences in player demographics, and that they apply across game genres and content’ (Przybylski et al. 2010, p. 163). They also warn that the application of SDT in video games remains at a starting point in the enquiry. The following studies and this thesis intend to further the application of SDT in video games.

Tamborini et al. (2010) in defining media enjoyment through video games and validate a model of enjoyment as a satisfaction of the higher order needs as represented in SDT and argue for the inclusion of these needs alongside traditional hedonic needs in research examining entertainment enjoyment. In an experimental setting they utilised the PENS scales to test for the satisfaction of autonomy, competence, and relatedness needs. Enjoyment was measured utilising the interest/enjoyment subset of the Intrinsic Motivation Inventory (Ryan 1982). They also justify SDT as a measure of video game motivation by suggesting that video games are intrinsically rewarding regardless of whether extrinsic rewards are present. Similar to this research, Tamborini et al. (2010) did not utilise the PENS scale items of Intuitive Controls or Immersion, instead utilising separate constructs of perceived game skill, co-playing and natural mapping. The needs proposed in the PENS scales and utilised in the study—autonomy, competence, and relatedness, were importantly, found to serve as a predictor of enjoyment. This reinforces that the

needs inherent in SDT and their influence on enjoyment in terms of video games are consistent across studies yet retain flexibility in the manner they are employed.

Tamborini et al. (2011) conducted two studies in order to demonstrate the value of defining enjoyment of video games in terms of non-hedonic and hedonic need satisfaction. The non-hedonic needs examined were the needs for competence and autonomy from the PENS scales. Due to the fact that the need for relatedness was associated only with multiplayer games (Ryan et al. 2006) this need was not examined in the studies as they were conducted using a single player game. The hedonic needs examined in the two studies were arousal and affect. Elements of arousal and affect are examined in varying degrees in this research through constructs of flow and social escapism. 'The two studies reported extend the findings of Tamborini et al. (2010), which demonstrated that the satisfaction of non-hedonic, intrinsic needs associated with SDT accounted for substantial variance in self-reported enjoyment' (Tamborini et al. 2011, p. 1036). This further underlines the utility of the scales in terms of the research paradigm they are employed in.

Reinecke et al. (2012) utilised the PENS scales in examining the role of need satisfaction in terms of mood management. Their specific target was to examine the influence of the intrinsic needs for competence and autonomy on selective exposure to media and whether the satisfaction of these needs could predict the subsequent enjoyment of the games. The degree of need for competence and autonomy were both found to have an influence on games chosen and it was suggested both predict enjoyment and as a result indicated that mood management can result from mood repair through need satisfaction. This indicated that once a player enjoys a game, mood repair or enhancement naturally follows and thus negates the need to examine mood management effects. Intuitive Controls, Immersion and the Need for Relatedness were not

examined in this particular research, again supporting that the PENS scales need not be used in entirety.

Peng, Lin, Pfeiffer and Winn (2012) specifically manipulated game features to examine how the basic needs of SDT could be met in an exergame (a game designed to induce and support exercise) and ‘provided additional empirical evidence that the need satisfaction-supportive features in a video game have positive effects on motivation and engagement-related outcomes’ (p. 191). Limitations lay in that only the needs for autonomy and competence could be tested and not relatedness due to a lack of resources (Peng et al. 2012). Furthermore the role of presence and intuitive controls were not examined. This research validates the use of the scales outside of traditional gaming contexts such as consoles or PCs. Smartphones could be considered a non-traditional gaming platform also.

Reinecke et al. (2012) utilized the Needs for Competence and Autonomy as part of a study that investigated their influence on selective exposure to video games and subsequently tested the influence of satisfying these needs on resultant mood repair. Their findings indicated that the satisfaction of the needs predicted enjoyment and subsequently that that mood management can result from mood repair through need satisfaction.

Johnson and Gardner (2010) asked players to recall a recent gaming experience and provide measures of personality via the ten-item personality inventory (TIPI) which is designed to measure the big five personality measure, and their gaming experience via the PENS scale. Crucially for this research Johnson and Gardner (2010) demonstrate links between aspects of personality and the PENS Scale. Examples include a link between agreeableness and the need for competence and a correlation between openness to experience and autonomy that suggests that players who are more open to experience are more likely to enjoy the interesting choices and

activities that video games provide. Johnson and Gardner's (2010) research 'provides validation of the PENS measure with a broader sample of experienced game players, shows variation in types of need satisfaction across game genres and offers initial evidence of links between personality and game genre preferences' (p. 279). This research offers valuable insights and indicates that the PENS scale can be utilised in conjunction with personality characteristics. Playfulness as a characteristic is examined in this research.

Lafrenière, Verner-Filion and Vallerand (2012) developed and validate a measure of gaming motivation, the Gaming Motivation Scale (GAMS) which included the PENS scales (Ryan et al. 2006) as the measure for intrinsic motivation. However, their scales incorporated the concept of extrinsic motivation as the scales that were developed measured integrated, identified, introjected, and external regulation, which are forms of extrinsic non self-determined motivational influences, as well as a-motivation. Given that this research proposes play as an intrinsically motivated experience the GAMS will not be utilised in this research.

Self Determination theory (SDT) and the needs established in Basic Psychological Needs (BPN) and Cognitive Evaluation Theory (CET) will form the basis of this research. Przybylski et al. (2010, p. 155) state that 'CET-based research demonstrates that activities foster greater intrinsic motivation to the extent to which they satisfy three fundamental human needs: the need for competence (sense of efficacy), autonomy (volition and personal agency), and relatedness (social connectedness)'.

On the basis of the preceding arguments for the PENS scales and the established usage of subsets of the scales in existing literature, this research proposes utilising and examining the central constructs of the PENS scales as part of the conceptual model, namely the theorised satisfaction of the Needs for Competence, Autonomy and Relatedness.

Given the previous arguments, it has been demonstrated that the Need for Competence, when fulfilled, has a motivating influence on play through enhancing enjoyment. Players want to feel good about their play, and their ability to achieve within a game. The fulfilment of the need for competence in order to achieve happiness and well-being has been demonstrated in many different experiments, studies and investigations. As part of the adapted PENS scales derived from SDT the Need for Competence has been found as a motivating influence for traditional video gameplay and as having a positive influence on video game enjoyment. Ryan et al. (2006) originally identified that '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. 350). 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. What distinguishes this research is that it intends to examine the role of the construct in a different context. It remains unknown how important the Need for Competence and how much influence, if any, it has on the enjoyment of smartphone games. Does the characteristic of smartphones as a time filler or distraction negate the appeal of the satisfaction of this need? Furthermore this thesis does not test for its influence in a post play experience survey. Instead it conceptualises the Need for Competence as a generally intrinsically motivating influence on the games people choose to play, rather than the result of a random post play experience not chosen by the player. This thesis seeks to underline how potentially influential the construct is on the general intrinsic motivations of smartphone play.

Therefore

**Hypothesis 1: The Need for Competence positively influences the enjoyment of smartphone games.**

The Need for Autonomy has also been found to have had a positive influence on people's intrinsic motivation and well-being, both in life and through video gaming. Players wish to feel that they have control and can exercise some level of autonomous behaviour while they play. The Need for Autonomy, when fulfilled, has consistently been demonstrated as an important factor in self determined behaviour and as a result, in greater levels of personal well-being. In video game terms, as part of the adapted PENS scales, the Need for Autonomy has been found as a motivating influence for traditional video gameplay and as having a positive influence on video game enjoyment. 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. While more traditional games such as World of Warcraft offer almost limitless options and choices for individual players, smartphone games remain a mix of casual and complicated gameplay that has yet to be examined in terms of this construct. The question remains, does the Need for Autonomy influence enjoyment on smartphone games or is a concept specific to more advanced traditional games? Similar to the approach adopted by this research with the Need for Competence, the Need for Autonomy will be situated for examination its role on the general enjoyment of games. Do people play games on their smartphones that offer options and choices and does this influence enjoyment?

Therefore

**Hypothesis 2: The Need for Autonomy positively influences the enjoyment of smartphone games.**

The Need for Relatedness, while not having had the same impact and usage as a variable in the video game literature as the Needs for Competence and Autonomy, has nonetheless been found

to be an important part of self-determined behaviour. The Need for Relatedness has been found as a motivating influence for traditional video gameplay within the multi player context and as having a positive influence on video game enjoyment. 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. While it remains unknown how applicable this need may be in terms of generalised game experiences, it also remains important to examine as this research remains exploratory in nature. A measure is developed in Chapter three, in order to make allowances for the distinction between single and multi player gaming experiences. Smartphone games are played on an inherently socially connected device and many games offer multiplayer capabilities indicating that the Need for Relatedness may have an important influence.

As with the Needs for Competence & Autonomy this research will examine the role of the Need for Relatedness in terms of the general smartphone gaming experience. It remains unknown whether the Need for Relatedness can be satisfied through smartphone games and as a result, impact on the enjoyment of games. As such, this allows for this thesis to make an important contribution through testing the impact of this multiplayer specific construct on a general model of enjoyment.

Therefore

**Hypothesis 3: The Need for Relatedness positively influences the enjoyment of smartphone games.**

The following three sections seek to expand upon the conceptual framework of SDT and the PENS scales by proposing variables that can add to our understanding of the intrinsic motivations for the enjoyment of smartphone games. The variables of Flow, Social Escapism and Competition have been used to examine the motivations behind various contexts including video

games. It is theorised that these variables can explain the enjoyment of games on smartphones beyond the inherent need satisfaction of autonomy, competence and relatedness examined by the PENS scales and can instead shed some light on the why of playing games in various contexts on smartphones. The PENS scales directly examines in game satisfaction of these Needs for Competence, Autonomy and Relatedness. They do not offer support beyond the game experience itself.

Flow, Social Escapism and Competition are independent variables previously established in the academic literature. These variables were selected due to their intrinsic orientations, their potential relevance to smartphone gaming and their lack of previous application in the smartphone context. These variables are linked to SDT theoretically as expressions of the satisfactions of the basic Needs for Competence, Autonomy and Relatedness. This is in order to allow a more thorough understanding of the intrinsic motivations for smartphone game enjoyment. Mobile play has been established as characteristics such as; potentially shorter play sessions, use as a distraction or time filler and being always accessible. The PENS scales fails to take these factors into account as an explanation of why people may enjoy smartphone games. As a result there remains a need to expand the conceptual model to take these characteristics into account.

While the satisfaction of the Needs for Competence, Autonomy and Relatedness serve as the conceptual underpinning of SDT, there are various conditions and contextual factors that can affect the satisfaction of these needs (Ryan & Deci 2000a). This thesis posits that the experience of Flow, Social Escapism and Competition provide context specific examples of the satisfactions of these needs that can further illustrate the understanding of intrinsic motivations to enjoy smartphone games.



## **2.5 The experience of Flow**

Flow is defined as an extremely enjoyable experience, where an individual engages in any game activity with total involvement, enjoyment, control, concentration and intrinsic interest. Given that ‘success gives the player a satisfaction, that lasts a shorter or a longer while, as the case may be’ (Huizinga 1938, p. 70), success in video games can be seen as delivering a satisfaction that optimally allows for a player to experience Flow.

Klimmt (2003) tells us that enjoyable games are ones that offer a balance between challenge and mastery. Players must be able to achieve within a game yet feel some level of suspense and curiosity as to whether they will be able to. This is a delicate balancing act that enjoyable games deliver. If a game is too easy a player cannot truly enjoy it as it offers no challenge, while a game that is too difficult will not allow for mastery.

The Need for Competence implies that individuals want to be effective in their actions (Deci & Ryan, 1985). Essentially referring to the need for an individual to be effective in dealing with the environment in which a person finds oneself. Deci and Ryan (1985) wrote ‘When people are intrinsically motivated, they experience interest and enjoyment, they feel competent and self-determining, they perceive the locus of causality for their behaviour to be internal, and in some instances they experience flow’ (p. 34)

Eccles & Wigfield (1992) relate flow theory to SDT theory by suggesting that it possible to reconcile the positions of Deci and Ryan (SDT) and Csikszentmihalyi (Flow). They suggest that play or exploratory behaviour can help to increase an individual’s competence (SDT) but that these behaviours are usually performed because of the immediate rewards offered such as being exciting or enjoyable (Flow). So while SDT suggests the ultimate outcomes, flow theory can be seen as an explanation for the gratifications during the immediacy of play. Indeed,

Csikszentmihalyi and Massimini (1985) have suggested that the experience of Flow is a reward that ensures that individuals will seek to increase their competence thus positively relating the flow construct as an identifiable measure of the need for competence. Deci and Ryan (2000) relate the two concepts further by stating that flow's postulate of 'optimal challenge is fully consistent with SDT's specification of the competence need as a basis for intrinsic motivation, for it is success at optimally challenging tasks that allows people to feel a true sense of competence' (p. 260). It is this 'optimal challenge' that this thesis proposes is a driver of enjoyment. Players will play games that facilitate a test of their skills, without being overwhelming.

According to research on flow and related work on play and intrinsic motivation, it is suggested that the perceived challenge of an activity is one of the key determinants of the experience an individual derives from the activity (Csikszentmihalyi 1975, Deci & Ryan, 1985) thus reflecting a need for competence. Flow can be seen as a truly intrinsically motivated experience that is achieved through personal actions and challenging of one's abilities.

To achieve optimal flow, the key factors in computer interactions are the perceived task challenge and a sense of being in control (Ghani 1991, Ghani & Deshpande 1994). Flow is the state of being achieved during an optimal experience. Csikszentmihalyi's original definition of flow (1975, p. 36) is the 'holistic sensation that people feel when they act with total involvement.' The experience of Flow is characterized by a narrowing of the focus of awareness, loss of self-consciousness; responsiveness to clear goals and unambiguous feedback; and a sense of control over the environment (Csikszentmihalyi 1975). Csikszentmihalyi identified eight major components of Flow shown in table 2.4.

**Table 2.4: Eight major components of Flow**

---

A challenging activity requiring skill
Direct, immediate feedback
Clear goals
Concentration on the task at hand
A sense of control
A loss of self-consciousness
An altered sense of time

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**Source: Based on Csikszentmihalyi (1975).**

Chen (2007) suggests that most video games deliberately leverage and utilise these eight components in their game design and that gamers in fact value games based on whether they can deliver a flow experience. Flow has been previously identified as a useful construct for describing human interactions with computers and information systems in numerous studies including (Csikszentmihalyi, 1990, Ghani 1991, Ghani & Deshpande 1994, Trevino & Webster 1992).

In their influential and pioneering work, Trevino and Webster (1992) examined the flow construct in computer mediated communications. They utilised four dimensions to describe characteristics of flow as a multidimensional construct characterized by the dimensions of control, attention focus, curiosity, and intrinsic interest. However, Finneran and Zhang (2003) question why these particular dimensions were used due to the lack of clarity as to whether they define flow or can be considered consequences or antecedents. They identify that flow theory needs to be re-assessed before using it due to the inconsistencies in the various models and constructs used in the literature. The likelihood of a flow experience is instead very contextually based and is dependent on the interplay between the person, their competence, the task, and the artefact.

Flow has also become an important construct in the study of cyberspace and online behaviour (Mathwick & Rigdon 2004, Novak & Hoffman 1997). In their seminal work, Hoffmann and

Novak (1996) provide some of the first evidence that marketers should seek to optimise their web presence in order to allow consumers to achieve a flow state and subsequently improve marketing experiences. Building on this early conceptualisation Novak, Hoffman and Yung (2000) utilised a structural equation modelling approach to measure the customer experience in online environments utilising flow as the central construct of their investigation. They conceptualised flow as a cognitive state experienced during web browsing that 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). Using data from a web based consumer survey; they examined a model built upon previous structural models that they consider to have examined a limited subset of the components of flow (Ghani 1991, Ghani & Deshpande 1994, Trevino & Webster 1992) as well as flow channel segmentation models (Nakamura 1998, Wells 1998).

Crucially they directly measured flow using a three-item scale following a narrative description of flow based on the successful use of this scale by Chen, Wigand and Nilan (1999) in examining the optimal experience of web activities. Chen et al. (1999) had found evidence that the flow construct was a valuable tool in investigating web behaviours. Another important finding by Novak et al. (2000) that flow was best used to measure experiential activities (like gaming) rather than goal orientated activities although later research (Novak, Hoffman & Duhachek 2003) found evidence for flow in both types of activities.

Building on this previous research Mathwick and Rigdon (2004) investigated the online search experience and how the flow influences consumers, finding a positive link between the flow experience and perceived play.

Flow has also featured heavily in the video game literature, for example; (Cowley, Charles, Black & Hickey 2008, Chen 2007, Chen & Park 2005, Chiou & Wan 2006, Choi & Kim 2004, Chou & Ting 2003, Hsu & Lu 2004, Jegers 2007, Jin 2012, Kim, Oh & lee 2005, Olson 2010, Seger & Potts 2012, Sherry 2004, Sweetser & Wyeth 2005, Wan & Chiou 2006). Sherry (2004) tells us that games possess the ideal characteristics as a medium to create and maintain flow experiences, subsequently directly linking flow to the enjoyment of games.

One of the more important works on the concept of Flow and video games is by Sweetser and Wyeth (2005) who provide an in-depth analysis of how flow and enjoyment of video games are linked. They link the enjoyment of games directly back to Csikszentmihalyi's (1975) eight major components of flow. Justifying their proposed theories through an examination of the literature Sweetser and Wyeth (2005) then validated their gameflow criteria through an expert review of two games. They then compared how each game had been critically received to how they scored on the gameflow criteria. The game that had scored impressively on critical reviews and enjoyed greater commercial success, also scored significantly better on the gameflow criteria. However Sweetser and Wyeth themselves acknowledge that limitations in the research lie in the particular games used which were MMORPG's (Massive Multiplayer Online Role Playing Games) which, as has been previously acknowledged in this thesis, account for a significant proportion of gaming research. This type of game has specific characteristics including traditionally being played much longer than more casual games such as the games played on smartphones.

Another important piece in the literature is Hsu and Lu's (2004) examination of why people play online games. While this research has already acknowledged the limitations of using TAM to explain motivation to play games, Hsu and Lu's model provides a good empirically based example of the effects of flow on video games. They hypothesised that Flow experience is positively related to a user's attitude towards playing an on-line game and intention to play an

on-line game. Hsu and Lu's (2004) hypothesis that flow was 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).

Flow has been previously examined in the mobile gaming literature. Engl and Nacke (2012) tested for elements of the flow experience through examining players' responses after playing a particular game. They asked subjects to agree or disagree with questions such as 'I forgot everything around me' after playing one of two available games. Their model attempted to frame experience with special regard to the overarching contextual influences that affected the gaming experience. In effect flow was examined to test for differences in different contexts and wider findings for the construct were not identified beyond this. This thesis tests for the experience of Flow and situates it in a larger scale that seeks to understand more of how it can influence intrinsic motivations towards the general enjoyment of games.

Flow has been established as an important psychological construct in the literature in regards to many different activities. It is strongly linked to intrinsic motivation and the subsequent enjoyment of activities. The experience of Flow has been found to have stronger links to experiential activities, such as play, as opposed to more goal orientated activities. Based on the proceeding arguments and the fact that the scale has been directly used in measuring video game play by (Hsu & Lu 2004), the online experience (Novak et al. 2003), web based learning (Choi, Kim & Kim 2007), children's use of video games (Jin 2012) and online purchase intentions (Korzaan 2003) as well as being adapted to investigate interactivity on websites (Sicilia, Ruiz & Munuera 2005), this research proposes the testing of the flow experience based on Novak et al. (2000) and used in the context of video games by Hsu and Lu (2004).

In effect, this research seeks to address not a breakdown of flow experience itself, but instead tests whether players have experienced Flow while playing smartphone games and proposes that this experience is positively correlated to the enjoyment of games. While Flow has strong and empirically validated theoretical connections to video game play, it has yet to be tested for its importance as one of the intrinsic motivations towards smartphone play and enjoyment.

Therefore

**Hypothesis 4: The experience of Flow positively influences the enjoyment of smartphone games.**

## **2.6 Social Escapism**

Social Escapism is defined as pleasurable, fun, and enjoyable activity that allows one to escape from reality, arousing emotions and feelings as well as relieving day to day boredom and stress. The social aspect of the construct is theorized as elements of the construct that allow a relief from loneliness through connection with others.

‘First and foremost, all play is a voluntary activity, play is freedom’ (Huizinga 1938, p. 26). In SDT, autonomy concerns the desire to self-organize one’s actions, when the individual can freely pursue the activity and feels volitional in doing so (Deci & Ryan, 1985, Ryan & Connell, 1989) as opposed to controlled behaviours, which are those that are experienced as being pressured by external or internal forces (Chua & Koestner 2008). When the basic satisfaction of autonomy or control over one’s actions is satisfied it will facilitate intrinsic motivation.

In terms of gaming Klimmt and Hartmann (2006) state that ‘as gamers know to a certain extent what will happen 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). Bowman & Tamborini (2013) demonstrated links between

video game play and mood repair, supporting that video games provide a vehicle for players to manage moods through the choice to play. What offers a clear distinction between mobile gaming and the more typical type of gaming the authors above were referring to is the fact that the mobile game allows the player access at all times due to the fact it is ever-present, thus offering potential mood management as required.

One construct that can be seen to represent this autonomy in terms of how people manage their moods and leisure or free time through a form of escapism is 'Social Escapism' (Korgaonkar & Wolin 1999). When Korgaonkar and Wolin (1999) examined the motivations for web usage using a multivariate analysis, they proposed Social Escapism Motivation as a possible intrinsic motivation. This construct was based on statements that characterise the web as a fun, pleasurable and enjoyable activity and emphasis the use of the web as entertainment. Social Escapism Motivation is seen as when individuals use the web to provide diversion, to arouse emotions and feelings and ultimately provide enjoyment.

Korgaonkar and Wolin (1999) originally created the construct as also overcoming loneliness, however their results showed that the motivation did relieve stress and boredom but perhaps did not provide the relief from loneliness they initially thought.

Their construct reflects mood management theory in that it encompasses relieving stress and arousing emotions and feelings, while escapism is represented by escaping from reality and forgetting about work. Zhou and Bao (2002) found that internet users with a social escapism motivation did so in order to satisfy their hedonic needs in their online surfing, a process perceived to be a pleasurable, fun, and enjoyable activity that allowed them to escape from reality. Zhou and Bao's results found a positive correlation between social escapism and perceived entertainment. Tojib and Tsarenko (2008) in a conceptual paper 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 identify it as an important predictor of mobile entertainment use.

Bryant and Davies (2006) in examining selective exposure to video games examined the literature to find links between the elements of mood management theory and the playing of games. They concluded that taken as a whole the research suggested that gamers play for the arousal inducing properties of the game. The interactive nature of games, which allows for greater engagement than a more passive medium such as TV, was identified as a motivation to play. This can be reflected through the player's choice of a particular game or due to the level of control games offer. Thus an individual can manage moods through game choice and subsequent play and enjoyment.

However Bryant and Davies (2006) acknowledge that while there are tremendous opportunities to researching these processes on video games, challenges remain in testing these theories given the complexities of video games and selective exposure experiments. Bryant and Davies (2006) examined the selective exposure literature to see how the research had application for video games. They found that while mood management theory was certainly a huge factor in the choice of games and that 'the research on video games suggests that gamers play their games because of the arousal-inducing properties of the games' (p. 184). There were other factors such as age, gender and repeat playing that needed to be investigated further in order for selective exposure theory to be successfully applied to gaming. Given the difficulties in examining mood management outside of experiments there remains a need to identify a simpler construct that can encompass the values inherent in mood management.

There's a strong link between the concept of mood management and escapism in the literature. Salisch, Opel and Kristen (2006) examined why children play games and found that 'because the survey data did not ask about participants' feelings before turning to the media, mood management in the sense of seeking arousal when bored and calmness when overstressed may not be differentiated from simple escapist needs' (p. 157). Klug and Schell (2006) found that many people play games to escape, in part, from what is going on in their lives. Yee (2006) identified escapism as a motive for play and defined it as using the online environment to avoid thinking about real life problems. Escapism has also been defined as a motive for play in several other studies for example (Hefner, Klimmt & Vorderer 2007, Klimmt, Schmid & Orthmann 2009, Wood, Griffith & Parke 2007) and also as a motive for mobile gaming (Okazaki 2008). While the theories of mood management and escapism offer parallels to each other and demonstrate an exercising of an individual's autonomy, they are separate theoretical concepts. Yet there remains a need to encompass these constructs within this research due to their prevalence in the literature and the characteristics of mobile gaming itself.

Given these characteristics of mobile gaming and as a result its potential immediacy of use, it can be seen as a potentially autonomous potential tool to facilitate escapism. Social escapism has been mentioned in latter research yet rarely used as a tool to investigate subsequent theories and phenomenon. However Joines, Scherer and Scheufele (2003) extended Korgaonkar and Wolin's work through extension of their seven underlying motivations for web use and the implications for e-commerce. In examining the motivations in terms of online shopping Social Escapism was not found to be a significant motivation, albeit in a context different to gaming and with a limiting sample size of fifty nine.

This research, in line with Tojib and Tsarenko's (2008) identification of the construct as an important factor of mobile use to relieve stress and boredom, believes that Social Escapism or

indeed aspects of the construct can further our understanding of the motivations behind mobile game play. Social escapism is experienced when mobile video games act as pleasurable, fun, and enjoyable that activity allows one to escape from reality, arousing emotions and feelings as well as relieving day to day boredom and stress. As a result of the preceding arguments this research will use the scales created by Korgaonkar and Wolin (1999) to measure how social escapism can influence and motivate the enjoyment of smartphone games, and a result suggests the following hypotheses of the direct effects on the enjoyment of smartphone games.

Therefore

**Hypothesis 5: Social Escapism positively influences the enjoyment of smartphone games.**

## **2.7 Competition**

Competition is defined as the need to beat friends and others at games. It is defined in this research as the need to beat or do better than other players while playing games (Greenberg et al. 2010).

Huizinga (1938, p. 110) states that ‘ever since words existed for fighting and playing, men have been wont to call war a game’ while also identifying that ‘modern social life is being dominated to an ever-increasing extent by a quality that has something in common with play and yields the illusion of a strongly developed play-factor’ (p. 231). Competition can be seen as one of the key aspects of play with both negative and positive social aspects associated with it (Hyland 1978). Competition has been identified as one of the primary motivations for video game play in children. While boys tend to be more competitive, many girls also enjoy the competitive element, which can facilitate socialisation between peers (Olson 2010).

The Need for Relatedness (Baumeister & Leary 1995) is the need to feel connected. In his seminal work, Kozinets (2001) identified the growing influence of consumer subcultures and

how they can influence entertainment choices based on a shared commitment to a particular mode of consumption. In effect how shared passion for something can lead to feeling connected. Muniz and O'Guinn (2001) extend this idea to brand communities, a social construct based around the mutual admiration of a particular brand, which provides evidence of the persistence of community in the wider consumer culture. What these studies indicate is that there is a growing trend towards a shared culture surrounding varied consumptions. As previously stated the need for competence is reflected in that individuals want to be effective in their actions. This effectiveness can not only be traditionally seen through the feedback offered by video games through scores, achievements and the completion of games, but also through the achievements against others as per traditional sports.

One motivation that can be seen as an outcome of the need to feel relatedness and the need for competence is competition. Hyland (1978) in deconstructing the original meaning of competition in sport, posits that as it is derived from the expression 'to strive together' competition can be seen as a means both to excel and to build relationships. Hyland (1978) makes a strong philosophical case for competition as a means towards improving ones competence and forming strong ties to others, 'we ought to strive at all times to let our competitive play be a mode of friendship' (p. 35).

Tauer and Harackiewicz (1999) tested the effect of competition on intrinsic motivation and found that whether it had a positive effect depended on the individual. However their studies identified strong links between competition and competence, and subsequently enjoyment.

Reeve and Deci's (1996) investigation of the competitive elements that affect intrinsic motivation directly included elements of self-determination theory. 'Results revealed, in line with cognitive evaluation theory (CET) that two elements of the competitive situation affected

intrinsic motivation (competitive outcome and interpersonal context) and that two variables (perceived competence and perceived self-determination) mediated these effects' (p. 30).

Stanne, Johnson and Johnson (1999) investigated whether competition enhanced or inhibited motor skill performance and found that it lead to greater levels of performance, in effect it had a positive influence. Tauer and Harackiewicz (2004) conducted a series of studies investigating the effects of competition and cooperation on intrinsic motivation, performance and enjoyment. 'Competition may have a positive effect because it poses an exciting challenge and/or increases the importance an individual places on doing well. As a result, individuals may become more involved in the activity, thereby promoting intrinsic motivation' (Tauer & Harackiewicz 2004, p. 850).

Competition can be seen as a motivation which is an outcome of the needs to feel relatedness and competent. Lazzaro (2005) identified that people play games they don't like in order to play with the people that they do. This reflects that gaming may not always be necessarily associated a desire to play video games. Bertozzi (2008) investigated competition and video gaming through gender differences. Her assertion, that 'males tend to use play as a way of determining their rank and status within a group, (p. 481), can be seen as reflective of both the Needs for Competence and Relatedness. Females, she acknowledges, relate to competition in a different manner, and are much more likely to be competitive in alternative criteria than gaming, although this form of competition can also be seen to be closely related to the Needs for Competence and Relatedness.

Vorderer, Hartmann and Klimmt (2003) identified competition as a major factor in the explanation of video game enjoyment and subsequent usage. They make a distinction between competitive elements as a player alone and competition between players which they define as social competition. However competitive elements in single player against the computer can be

seen as being reflected in the need for competence and the flow construct. This research, while acknowledging that competition can be seen as a reflection of the need for competence, identifies that it also reflects a need for relatedness. Vorderer et al. (2003) identify that competitiveness is individually based and can reflect a strong motivation to play.

The UGT approach identified competition as an important gratification of video game play. Lucas and Sherry (2004) in investigation of gender differences in video games revealed that 'competition – 'to be the best player of the game' (p. 503) was a stronger motivation for males than females although it had a motivating influence for both. Sherry et al. (2006) found competition to be a strong motivational factor due to the fact that it through video games it provided 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 fact is what sets video games apart from traditional media.

Play as a social phenomenon that incorporates challenges between players can be seen to be demonstrated through competition. Competition has been established as an important motivational factor in traditional play such as sports, and more recently in video games (Greenberg et al. 2010). Furthermore Competition has been identified as one of the basic elements of intrinsically motivating activities (Csikszentmihalyi 1975, Deci & Ryan 1985) and in terms of mobile game play, Li and Counts (2007) suggested that competition acted as an effective motivator for play. The competition variable established in this research is one both established in the video game literature and stands as a measure of competition as an intrinsically motivated construct as opposed to extrinsically motivated. Given the preceding arguments, particularly the established importance of competition as a driver of play, the following hypothesis is proposed.

Therefore

**Hypothesis 6: Competition positively influences the enjoyment of smartphone games.**

## **2.8 Dependent Variable – Enjoyment**

Enjoyment is the core of media entertainment (Vorderer et al. 2004). While traditionally usage or intention to use have fulfilled the role of the dependent variable in empirically based video game studies, there is a strong case to be put that enjoyment is uniquely suited as a dependent variable when it comes to any play experience including smartphone gaming. In fact throughout Self Determination Theory, the enjoyment scale is considered the self-report measure of intrinsic motivation (Ryan, Mims, & Koestner 1983).

Vorderer et al. (2004) conceptualized media related enjoyment as a complex construct encapsulating many different facets, yet lies at the core of all experiences of media enjoyment. They identified the growing importance of understanding enjoyment as modern individuals devote incredible amounts of time to the entertainment experience in the pursuit of fun. They suggested that to cover the variety of motives involved in the concept of media enjoyment is very broad and included just three motives in their model; escapism, mood management plus achievement and competition. Vorderer et al. (2004) advocate the notion of entertainment as play in order to understand enjoyment.

Enjoyment has also been defined as being an intrinsically motivated in a diverse range of different contexts such as the internet (Yi & Hwang 2003), exercise (Ryan, Frederick, Leps, Rubio & Sheldon 2007), computer use in the workplace (Davis, Bagozzi & Warshaw 1992), fashion (Workman & Studak 2005), sports psychology (Kimiecik & Harris 1996) and education (Heyman & Dweck 1992). This re-enforces the validity and utility of the construct.

While usage has traditionally served as a measure of play of video games, this thesis argues it is an inappropriate measure. Given that mobile games are used as casual time fillers (Hjorth & Richardson 2009), as a longer more engaging experience more akin to traditional console gaming (Richardson 2011), and indeed as a secondary activity (Kultima 2009), the discrepancy between the nature of these uses would suggest that asking users to estimate average time spent playing would result in difficulties. Tobin, Bisson and Grondin (2010) in experiments testing the validity of self reported of video game usage found it an unreliable measure. Wu and Du (2012) also found that this form of reported usage is the least accurate method of measuring usage. Recent research by Kahn, Rattan and Williams (2014) that has explicitly demonstrated the flaws in self reported usage as a measure has subsequently validated the approach of this thesis in not utilising usage as part of the conceptual model.

In SDT there is a distinction between what motivates action or drives actions and ‘the most basic distinction is between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome’ (Ryan & Deci 2000a, p. 55). In education, for example, because a lot of what is needed to be learned is not enjoyable for students, extrinsic incentives are commonly used to motivate students (Ryan & Deci 2000a). While Silvia (2005) made a distinction between what is interesting and enjoyable, in terms of the context of video games, Sweetser and Wyeth have stated that ‘player enjoyment is the single most important goal for computer games’ (2005, p. 1) and Tamborini et al. (2010) define media enjoyment as the satisfaction of intrinsic needs. This underlines the appropriateness of enjoyment as the dependent variable in this thesis.

In fact, most of the literature based on the combination SDT and video games strongly supports the notion of enjoyment as being one of the optimal outcomes of the satisfaction of intrinsic



needs. Ryan, Rigby and Przybylski (2006) implicitly define enjoyment as the satisfaction of SDT's theorised needs of autonomy, competence and relatedness due to the fact that their results showed that the satisfaction of the needs can independently predict both enjoyment and future game play. Ryan et al.'s (2006) original hypotheses were based on the assumption that people play games because they are intrinsically satisfying or fun. Game enjoyment was measured within the studies with items adapted from the Intrinsic Motivation Inventory (IMI, Ryan, Mims, & Koestner 1983).

Their first study on a single player platform game confirmed their 'principle hypotheses that gaming motivation and enjoyment can be accounted for by experiences of competence and autonomy while playing' (Ryan et al. 2006, p. 352). The second study which allowed for an examination of the differences between a critically well received game and a poorly received game again confirmed that greater need satisfaction of competence and autonomy can lead to greater enjoyment of a game. The third study again 'show that games that elicited greater experiences of autonomy and competence resulted in more enjoyment' (p. 357). The fourth study which was survey based on existing experienced players of the popular online multiplayer game World of Warcraft tested the need for relatedness as well as autonomy and competence. As before the satisfaction of the identified needs using the PENS scales resulted in greater enjoyment of the game.

Przybylski et al. (2009) while extending their theories to incorporate the influence of violence in games found that individual differences in aggression, while independent predictors of preference for future play, did not predict enjoyment during game play. Their results again showed need satisfaction as a consistent motivator but curiously that more aggressive individuals would play a violent game more despite not enjoying it. 'Level of game violence did not account

for the appeal of games; in fact, it was negatively related to game enjoyment once need satisfaction was accounted for' (Przybylski et al. 2009, p. 159).

Przybylski, Weinstein, Ryan and Rigby (2009) in utilising SDT to examine compulsive play of video games, found strong correlations between low basic need satisfaction and low game enjoyment. While not utilising the PENS scales and instead measuring basic need satisfaction, their results demonstrated that there may not be a direct link between the enjoyment of games and the usage of games and instead there may be an inverse relationship due to obsessive play. Tamborini et al. (2010) examined the concept of media enjoyment and presented and tested a formal model of enjoyment as need satisfaction, building on the original work of Ryan et al. (2006). The model's predictive strength drew attention to the value of needs associated with psychological well-being in order to understand enjoyment.

Tamborini et al. (2011) found support for a need satisfaction model that demonstrated that both hedonic and non-hedonic intrinsic need satisfaction accounted for unique variance in the enjoyment of video games. Reinecke et al. (2012) extended the work of Tamborini et al. (2010, 2011) through investigating the influence of the PENS scales intrinsic needs for autonomy and competence on selective exposure and resultant mood repair. The subsequent mood repair was represented as enjoyment. Enjoyment in all studies was again measured with items from the interest/enjoyment subset of the Intrinsic Motivation Inventory (IMI; Ryan 1982).

In regards to other variables identified in this research there are further links to enjoyment. Sweetser and Wyeth (2005) linked the concept of flow directly to game enjoyment and created a measure that can be used to measure enjoyment in experimental conditions, although the measure was found to be limited in reference to specific game types and genres. Sherry (2004) reported that in terms of video games 'flow offers a theoretical explanation for a gratification that has

been reported in many studies: enjoyment' (p. 344). Korgaonkar and Wolin (1999) originally defined Social Escapism as a factor very similar to the concept of entertainment and that the context where it was applied could be gratifying in its ability to provide diversion, arouse emotions and provide *enjoyment*. Vorderer et al. (2003) regarded competition as a key element of the explanation of player's entertainment experiences and subsequent enjoyment.

Barnett (2007) in the original creation of the Young Adult Playfulness Scale identified that playful individuals are able to transform virtually any environment to make it more enjoyable. Barnett (2011) contrasted individuals in terms of their level of playfulness and the leisure activities that they enjoyed, finding that, among other internal rewards, enjoyment was reported as more important to experience in their free time for more playful individuals. Barnett (2012) defines enjoyment alongside a need for challenge as an intrinsically motivated experience and that more playful people tend to be more intrinsically motivated. Qian and Yarnal (2011) reported that playful individuals have a greater tendency to enjoy leisure and to entertain the self. By reframing situations to one that is more enjoyable, playful people are better able to take pleasure in everything they do. The experience of enjoyment can be seen as central to more playful individual's outlook or experiences.

Enjoyment as a construct provides an established outcome in terms of what is examined in this research. It also can be seen to represent the outcomes of play and is one of the key reasons for people to be intrinsically motivated.

## **2.9 Player Characteristics**

### **2.9.1 Demographics of Age and Gender**

Demographics and personality traits influence preferences for various entertainment choices (Rentfrow, Goldberg & Zilca 2011). Gender has an influence on motivations, including areas

such as competency, value, and self-efficacy beliefs, and these influences are domain-specific (Meece, Glienke & Burg 2006) while most intrinsically motivated behaviour can also be seen as a result of individual interests that vary as a result of gender and age (Renninger 2000). This indicates that age and gender can potentially have an influence on any examination of intrinsic motivations that is domain specific.

McCarthy and Shrum (1993) examined the demographics of age, gender, income and education in terms of personal values and television viewing preferences. In terms of this research it is important to note that gender and age were found to be the most significantly influential demographic factors. Gender and age have been established in the literature as important factors in terms of the motivation to play games. Demographics have an influence on video game play, yet factors such as age and gender have yet to be specifically examined in terms of intrinsic motivations of mobile games on smartphones in a large scale study. While Engl and Nacke (2012) did examine these variables in terms of mobile gaming, their findings were limited to the effects of context, in effect extrinsic influences. Their study was based around examining how play was affected in different environments and ran game playing experiments with thirty five respondents. However their findings did identify differences in age and gender, with younger players and males filtering out contextual effects. This implies a gap exists where these variables are worthy of investigation in terms of a larger study of mobile play and intrinsic motivations.

Further emphasising the need to situate age and gender in this research are studies such as by Lucas and Sherry (2004), who examined the differences between the genders in terms of traditional video game results with a number of interesting results. Male players were more likely to be video game players than females and tended to play for longer periods of time. Males were also more likely to enjoy the social aspect of gaming and were significantly motivated by competition. Both genders were highly motivated by challenge with females more motivated by

challenge than competition. In effect both genders were motivated by the challenge inherent in the game play itself but males were more likely to be engaged by competition with others.

Sherry et al. (2006) in a further study found similar results between males and females. They examined four samples of fifth, eighth and eleventh graders plus university students, the mean differences between the genders varied by sample with the biggest differences between the genders starting in the fifth grade, followed by college students, eleventh graders and eighth graders.

Von Salisch, Opel and Kristen (2006) identified that what was attractive in terms of the motives for playing video games for children varied in terms of both age and gender. Raney, Smith and Baker (2006) through investigating the appeal for adolescents found that there were differences between the genders and also that, for teenagers there was a need for a social connection through playing games and social capital gained through knowledge of the latest gaming trends, which may not be applicable for adults. 'The gratifications sought through media use vary between individuals of different ages, gender and stages in life among other factors, as well as within individuals given situational factors such as mood, time of day, and stress. 'With this in mind, it can be expected that individuals might turn to video gaming playing to meet the various needs they experience' (Raney et al. 2006, p. 166). This re-enforces that age and gender influence differences in motivation for the consumption of video games.

Greenberg et al. (2010) examined orientations to video games among gender and age groups utilising a uses and gratifications approach. Examining nine gratifications, they found age differences for seven of the nine but not related to age in a consistent linear fashion. The motivations for play were found to differ by both age and gender. While 'gender is the dominant differentiating trait in playing time, in strength of motivation, and in genre preferences'

(Greenberg et al. 2010, p. 17), age differences were observed in gratification prominence, game genre preferences and amount of time played. Nsyveen et al. (2005) in examining intention to use mobile services 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).

Feijoo et al. (2012) acknowledge that the wide ranging demographics of mobile gaming due to the increased penetration of smartphones is of interest and cite that a 2009 survey ‘revealed that baby boomers (aged 45 and older) increased their video game playing via mobile devices by 52% compared with a modest increase of 2% for generation-Y consumers (aged 18–24), although obviously they began from much different levels of penetration’ (p. 218). The authors acknowledged that mobile games up to 2007 were characterised as simple, relatively dated, games that were similar to those found on consoles fifteen years earlier. The technology of phones was holding games back and games remained resolutely casual although these characteristics may have contributed to an initial widening of the traditional gaming demographic base (Feijoo et al. 2012). Yet different age groups or generations still have differences in terms of technological adoption and use (Williams & Page 2011). Kim (2013) identifies that mobile gaming has shifted demographics in terms of both age and gender, in that females may play more than males on mobile and that both younger and older players are playing games on mobile. Mobile gaming remains the catalyst for the most dynamic demographic shift to have ever happened in video gaming.

These rapid changes in terms of who is playing mobile games indicate that there remains a need to fully understand the shifts behind these evolving demographics. Do the motives for play differ between males and females? Is the enjoyment of mobile games motivated differently depending on age? This research will seek to clarify differences in both age and gender in terms of the

motives for play in smartphone games due to the arguments and research outcomes suggested in the literature based on these demographic factors. Therefore this research proposes that the player demographics of age and gender will have an interaction effect on the motivational influences and outcomes identified in this research. Baron and Kenny (1986) provide the seminal distinction between the two most common interaction effects, moderation and mediation. A moderating variable can be seen as a variable that influences the strength and/or direction of the relationship between the independent variables and dependent variable while a mediating variable is one that accounts for the relationship between the independent variables and the dependent variable (Baron & Kenny 1986). This research argues that characteristics of age and gender are not key drivers of the play experience yet have some influence.

One original contribution of this research is that it represents a fresh context, smartphone gaming, which has established previously, has contributed to the normalisation for females and older gamers. One example is that previous studies, such as by Lucas and Sherry (2004), found that males are driven more by direct competition and social relationships. Yet their study was done when males played more frequently and for longer, as opposed to recent assertions by Kim (2013) that argues that females play more on their smartphones. Could this mean that females are now more competitive and socially driven than males? There is no current research available to take into account these developments and while game genre choice has been found to be an influence on gender differences, this thesis seeks to investigate general play rather than game specific outcomes. Similarly, age has yet to be examined in the context of smartphone gaming, which as previously established in Chapter One of this thesis, has introduced gaming to a new audience of older gamers. As a result, it is difficult to make specific predictions on how Gender or Age will influence the various motivations and their influence on enjoyment, yet the literature suggests that they will act as a moderating influence.

Therefore

**Hypothesis 7: Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.**

**Hypothesis 8: Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.**

### **2.9.2 Playfulness**

‘The predisposition to frame a situation in such a way as to provide oneself (and possibly others) with amusement, humour, and/or entertainment’ (Barnett 2007).

Given that this research seeks to conceptualise smartphone gaming as play, it remains a valid conceptual point to extend this framing device to players themselves. As previously stated there remains a need to examine the psychology of play itself in conjunction with intrinsic motivation for an optimal understanding of any model of entertainment. One area in the literature that remains relatively under explored in the modern ‘ludic’ society is the concept of playfulness itself.

Playfulness as a trait, or characteristic, of an individual has traditionally been examined in the context of children. Amongst the first to identify playfulness as a trait rather than an observed behaviour was Lieberman (1965, 1966) who attempted to view play by focusing on the child rather than the setting. Building on this work, Barnett (1990) sought to move further away from play as a manifestation of what a child does and instead move towards play as an internal predisposition to be playful. Barnett developed a measure of playfulness in a child that incorporated five constituent dimensions of playfulness comprising of physical spontaneity, social spontaneity, cognitive spontaneity, sense of humour and manifest joy. A general



playfulness factor was obtained thus illustrating the comprehensiveness of the trait as part of the individual. Barnett's (1990) playfulness scale allows research to move forward in explain the nature of, antecedents of and consequences of play behaviour. The scale can be used as a measure of a child's internal disposition to bring a playful quality to their interactions within different environments and contexts (Barnett 1991).

While it has been conjectured that playfulness carries over from childhood into adulthood (Bjorklund 2007, Lieberman 1977, Solnit 1998), research of playfulness using adults has been limited. One of the foremost measures of playfulness in adults was conducted by Glynn & Webster (1992). While investigating playfulness as a trait Glynn and Webster (1992) developed a theory-based measure of adult playfulness. The Adult Playfulness Scale is a self-report visual analogue measure comprising 32 items of paired adjectives, based on the semantic differential technique. Five studies, conducted in laboratory and field sites, with over 300 individuals examined, investigated the psychometric properties and correlates of playfulness within the workplace.

Glynn and Webster (1992) while developing their adult playfulness scale defined playfulness as an individual predisposition to define and engage in activities in a non-serious, imaginative or fanciful manner in order to increase intrinsic enjoyment of those activities. Their investigations of playfulness yielded a trait that was quite stable across individuals. The Adult Playfulness Scale represents a comprehensive measure of adult playfulness incorporating factors of spontaneity, expressiveness, fun, creativity and silliness, paralleling previous research on playfulness in children (Barnett 1990,1991). Glynn and Webster (1993) validated their construct further finding that the scale can be applied universally regardless of intelligence, gender or age. Crucially they found that playfulness as a trait correlated positively with intrinsic motivational

orientation. This offers support to the position of this thesis in reconciling playfulness with a model of intrinsic motivations.

Glynn and Webster (1992) themselves question the empirical validity of utilising their scale outside of the workplace due to the workplace based context of the research. Given that play on a smartphone has been established here as an intrinsically motivated hedonic experience, a measure of playfulness based on the workplace does not seem appropriate. Kruger's (1995) review of the Adult Playfulness Scale included criticisms such as content and construct validity being inadequate and that its optimal use would be for the manager of a work team. The limitations inherent in this scale indicate a poor fit for the research questions posed in this thesis.

Bozionelos (1996) tested Glynn and Webster's scale in relation to computer anxiety finding that individuals who score higher on playfulness were less likely to experience anxiety when using computers. In fact playfulness in 'microcomputers' had been examined previously by Webster and Martocchio (1992), based on Lieberman's (1977) research, again in a workplace setting. Subsequent studies such as Novak, Hoffman and Yung (2000), Moon and Kim (2001) and Hoffman and Novak (1995) use this construct 'microcomputer playfulness' as intended, as a specific measure of playfulness towards computers. Yet it remains plausible that a measure developed towards computers over twenty years ago has little validity in a world where 'the rapid development of digital technology continues to make computers and computing a part of everyday experiences' (Yoo 2010, p. 213). Measuring someone's sense of playfulness towards their work computer and play on their personal smartphone device can be seen as inherently different activities due to the inherently different nature of the tasks involved. Work, while optimally intrinsically motivated (Gagné & Deci 2005) it remains an environment driven by extrinsic influences. This dictates that an optimal measure of playfulness must be one that can reconcile itself easily with the approach of this thesis.

One measure of playfulness that can be seen to reflect the approach of this thesis is by Barnett (2007), who sought to extend previous research on the playfulness trait through developing a Young Adult Playfulness Scale. Barnett refutes Glynn and Webster's (1992) assumption that play is the opposite of work, citing Csikszentmihalyi(1990), Csikszentmihalyi and LeFevre (1989) and Starbuck and Webster(1991). The goal of Barnett's study was to determine if playfulness could be more precisely identified as a meaningful psychological construct in young adults. Focus groups of six to ten undergraduate students were asked to identify characteristics of playful and non-playful people. Six hundred and forty-nine undergraduate students were subsequently asked to rate both themselves and others on the resultant forty-two descriptors. The selection of which descriptors most saliently depicted playfulness were determined by carefully examining each one to search for the most consistent combinations of significant relationships with playfulness, in combination with demonstration of discriminability on both self-and other-ratings.

Fifteen of the descriptors were retained based on these criteria – all showed significant correlations across all rating groups and occasions, as well as significant differences between high and low playfulness' (Barnett 2007, p. 953). Barnett was left with fifteen key items that constitute a measure of young adult playfulness and the findings led to the following definition of playfulness; 'Playfulness is the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humour, and/or entertainment. Individuals who have such a heightened predisposition are typically funny, humorous, spontaneous, unpredictable, impulsive, active, energetic, adventurous, sociable, outgoing, cheerful, and happy, and are likely to manifest playful behaviour by joking, teasing, clowning, and acting silly' (Barnett 2007, p. 955).

Barnett's scale demonstrates no differences based on gender, unlike the trait when measured in children (Barnett 1990), and the propensity towards playfulness appears to be more fully incorporated as a characteristic style or approach to one's environment. This raises the question of what impact will playfulness have on a person's use of mobile games on their smartphone?

Qian and Yarnal (2011) conducted an analysis of the role of playfulness in the leisure stress-coping process among young adults, utilising Barnett's (2007) scale. One of their crucial findings was that young adults of a more playful nature are more likely to seek companionship through social leisure and to enhance mood through leisure pursuits. Leisure pursuits such as play and video games are intrinsically motivated and Qian and Yarnal's (2011) findings enforce the potential suitability of the scales for use in this context.

Barnett (2011) examined the role of playfulness in the leisure preferences of university students, examining the activity preferences they made, the motives they had, and their perspectives on their leisure time. It was found that the leisure activities experienced were not different but that playful individuals, perceive and experience them differently, and have different motives and desire different experiences and outcomes from their free time. It was also found that more playful students are more likely to 'experience internal rewards, active and novel engagements, opportunities to be challenged and further develop their skills, and have social interactions' (Barnett 2011, p. 397). The scale was further validated by Barnett (2012) where one significant outcome was that playful people are not motivated by tangible rewards. Furthermore Barnett (2012) concluded 'that playfulness is an internal predisposition, possessed in varying degrees, and facilitated/fostered by aspects of personality and, to lesser extents, affective style and motivational orientation' (p. 191).

Given that playfulness as a definition is framing any situation to provide entertainment and has parallels with mobile gaming's use as entertainment in any situation, at this point there appears to be a connection between the two concepts. Playfulness, as defined by Barnett and mobile gaming, as identified in the literature, both reflect intrinsically motivated action as a result of contextual influences such as the situation someone may be in. Furthermore, playfulness, like video games, is also situated in the conceptual framework of play itself. It is the definition of playfulness itself that offers connections to the concept of mobile play given that people play games on their smartphones in a variety of situations. Moore (2011) identifies the gamer as a mobilised and *playful* identity.

On the basis of these arguments, this study uses the Young Adult Playfulness Scale in order to investigate whether playfulness has an influence on the enjoyment of smartphone games. Similar to the influence of age and gender, the following hypothesis is suggested of the affect playfulness has on smartphone gaming:

**Hypothesis 9: Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.**

## **2.10 Summary of the literature review**

The results of the literature review are summarised in Tables 2.5, 2.6 and 2.7.

**Table 2.5 Summary of the arguments for SDT and the PENS scales**

Driver	Key Content	Hypothesis
The Need for Competence	(Deci & Ryan 2000; Ryan et al 2006; Przybylski et al 2010 )	The Need for Competence positively influences the enjoyment of smartphone games.
<p>Commentary: The literature strongly supports the Need for Competence as having a direct influence on the enjoyment of traditional games and as being instrumental in motivating players to continue playing a game. The need still remains to be tested in terms of general play experiences and situated on the smartphone platform.</p>		
The Need for Autonomy	( Deci & Ryan 2000; Ryan et al 2006; Przybylski et al 2010 )	The Need for Autonomy positively influences the enjoyment of smartphone games.
<p>Commentary: Similar to the Need for Competence, here is also strong support for the Need for Autonomy as having a direct influence on enjoyment as well as a need to test it both in terms of general play experiences and on the smartphone platform.</p>		
The Need for Relatedness	(Deci & Ryan 2000; Ryan et al 2006; Przybylski et al 2010 )	The Need for Relatedness positively influences the enjoyment of smartphone games.
<p>Commentary: The Need for Relatedness has a direct relationship with enjoyment in terms of being explicitly tested in relation to multiplayer games. In terms of this research the construct has a more tenuous relationship as this thesis is testing general gameplay rather than specific multiplayer experiences. However it remains valid to test and see if the construct does have a role in the overall smartphone gameplay experience.</p>		

**Table 2.6 Summary of arguments for Flow, Social Escapism and Competition**

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Driver	Key Content	Hypothesis
Flow	(Csikszentmihalyi 1975; Novak et al 2000; Hsu & lu 2004)	The experience of Flow positively influences the enjoyment of smartphone games.
<p>Commentary: Flow has been inextricably linked with the enjoyment of video game play. This research does not seek to break down the flow experience as it is testing general gameplay rather than a single gaming experience. Instead this research examines the 'experience of flow', using established scales, in relation to enjoyment and offers insights into whether the experience transcends traditional gaming experiences and is part of the more 'casual' smartphone experience.</p>		
Social Escapism	(Zillmann 1988; Korgaonkar & Wolin 1999; Zhou & Bao 2002)	Social Escapism positively influences the enjoyment of smartphone games.
<p>Commentary: The characteristics of mobile play identified in the literature indicate that mobile play is often used for escapist and social purposes. This research seeks to examine Social Escapism and its influence on the enjoyment of smartphone games as the construct reflects escapist and social properties that would potentially reconcile well with the smartphone game experience.</p>		
Competition	(Vorderer, Hartmann, and Klimmt 2003; Lucas & Sherry 2004; Greenberg et al 2010)	Competition positively influences the enjoyment of smartphone games.
<p>Commentary: Competition has been established in the literature as an important construct when understanding the motivations to play games. This research seeks to establish whether this intrinsically motivated realisation of the concept influences the enjoyment of smartphone games. The relationship between the two may be slightly oblique but given the causal nature of this research it remains important to examine this construct in this particular context.</p>		

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**Table 2.7 Summary of the arguments for Playfulness, Age and Gender.**

Driver	Key Content	Hypothesis
Playfulness	(Barnett 2007; Barnett 2011; Qian & Yarnal 2011; Barnett 2012)	Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.
<p>Commentary: The specific playfulness construct used in this research is as a result of its definition as ‘the predisposition to frame a situation in such a way as to provide oneself with amusement, humour, and/or entertainment’ This reconciles well with the established use of mobile games as a context based diversion. The construct has also had little use in the literature and playfulness itself has indeed been seen little in the marketing paradigm. Accordingly the use of this construct can add to theory as an original contribution in this context.</p>		
Age	Lucas & Sherry 2004; Greenberg et al 2010	Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.
<p>Commentary: Given that mobile gaming has been established as one of the factors in normalising video game play for older generations it is apt that the differences between different ages is examined for its impact on the experience.</p>		
Gender	Lucas & Sherry 2004; Greenberg et al 2010	Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience
<p>Commentary: Similarly given that mobile gaming has accelerated the ‘rise of the female gamer’ it remains important to examine how differences between genders is realised in terms of the smartphone game experience.</p>		

## 2.11 A Proposed Conceptual Model

Based on preceding theoretical arguments and empirical findings, summarised in tables 2.5, 2.6 and 2.7 a conceptual model is proposed. The investigation of intrinsic motivations to enjoy smartphone games is depicted diagrammatically in Figure 2.3. This model provides the theoretical underpinning of this thesis.

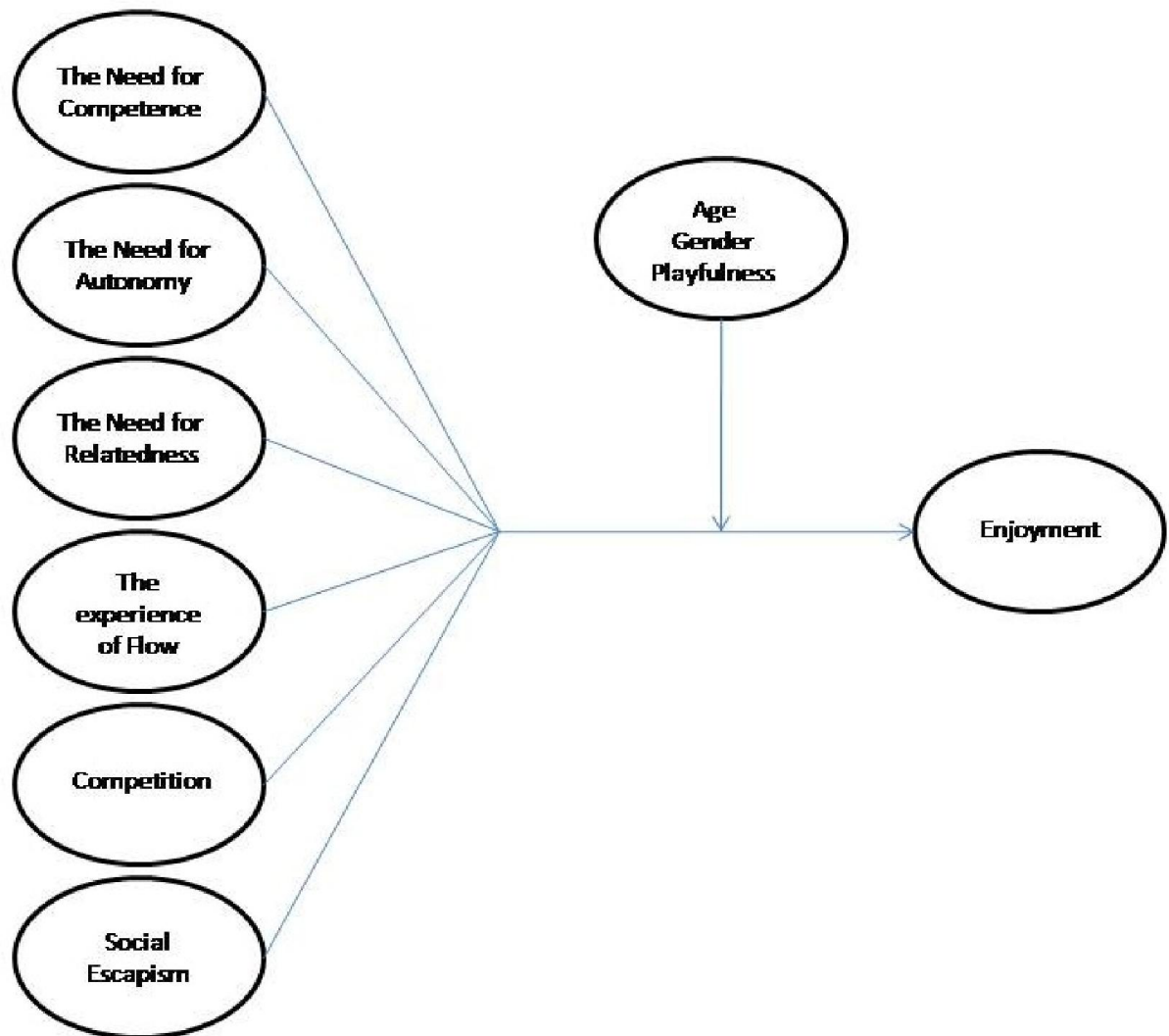
Figure 2.3 depicts the hypothetical conceptual model for assessing the motivations and outcomes of video game play on smartphones. In order to investigate how the independent variables influence the dependent variable of enjoyment, this research proposes utilising a standard linear regressions approach in order to measure the strength of the relationships identified in the model. In establishing play as an intrinsically motivated experience the following intrinsic motivations identified in the literature will be used as independent variables. The Needs for Competence,



Autonomy and Relatedness (Ryan et al. 2006) are all proposed to influence player's enjoyment of games. Similarly, the experience of Flow (Hsu & Lu 2004), Social Escapism (Korgaonkar & Wolin 1999) and Competition (Greenberg et al. 2010) are proposed as positively influencing enjoyment of games.

Influencing the intrinsic motivations are the player's characteristics. This is due to a need to understand where characteristics influence the constructs established in the model. Demographics of age and gender are proposed as having a moderating influence between the motivations of, and enjoyment, of games, as is a player's level of playfulness. This model presents an original and unique perspective on the understanding of smartphone video gameplay that can add to the understanding of a recent and increasingly important phenomenon as well as enhance our understanding of play.

Fig 2.3 Proposed conceptual model



## 2.12 Hypotheses Summary

The following hypotheses are proposed:

Hypothesis 1: The Need for Competence positively influences the enjoyment of smartphone games.

Hypothesis 2: The Need for Autonomy positively influences the enjoyment of smartphone games.

Hypothesis 3: The Need for Relatedness positively influences the enjoyment of smartphone games.

Hypothesis 4: The experience of Flow positively influences the enjoyment of smartphone games.

Hypothesis 5: Social Escapism positively influences the enjoyment of smartphone games.

Hypothesis 6: Competition positively influences the enjoyment of smartphone games.

Hypothesis 7: Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 8: Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 9: Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

# **Chapter 3**

## **RESEARCH METHODOLOGY**

### **3.1 Introduction**

Chapter one introduced the pertinent research questions, objectives, potential contribution of this thesis and the scale of the industry in question. Chapter two presented an overview of the relevant literature which allowed for a conceptual frame of reference in order to establish a conceptual model to guide the subsequent empirical research. The literature review chapter concludes by identifying a relevant conceptual model, driven by the literature, which can fill an identified gap in the consumer behaviour knowledge.

The aim of this thesis is to establish a plausible model for understanding the intrinsic motivations for playing games on smartphones and how player characteristics can influence this. The literature review subsequently translated these aims into a number of research questions and hypotheses which provided direction for the construction of the research approach. As the stated hypotheses identify critical constructs and proposed relationships between these variables, this thesis leans toward employing quantitative methodology.

### **3.2 Research Approach**

In terms of selecting a relevant research design, this thesis adopted both a descriptive and causal research approach facilitating quantitative data analysis. Quantitative research has several main goals; to make predictions about relationships between factors and behaviours, to gain insights into these relationships, validate any existing relationships and to test various hypotheses in regards to these relationships (Hair et al. 2006). Consideration toward the research approach also demands identifying critical dependent and independent variables and the examination of the relationships between them. A quantitative approach is more directly related to descriptive and causal research than to exploratory designs. Moreover, a research outcome of describing and

making inferences about a data set typically demands there is an interrelationship between descriptive and causal research. Malhotra, Hall, Shaw and Oppenheim (2008) acknowledge that distinctions among research designs are not absolute and research may incorporate one type of research design in concert with another.

This approach was reflected in this thesis whereby a causal research design was combined with descriptive research. The descriptive research was relevant in the preliminary stage of establishing the conceptual model. The objective of gaining insights and understanding of constructs guided the descriptive research. Item adaptation for scale development constituted the first phase of descriptive research.

### **3.3 Implementation of the Measurement Instrument**

#### **3.3.1 The Content**

This section describes the content of the questionnaire used for the survey and the process of its development. The research questionnaire was hosted online on the university website utilising Qualtrics software. A marketing research company, Research Now, supplied the respondents from their own panel of respondents. Respondents were directed to a survey on smartphone use. The panel was asked to select from a list of ten activities on which they used their smartphone for. Panel members who did not select playing games from the list were directed to a message informing them that they did not meet the criteria of the survey. In order to ensure a relatively even split between male and female respondents, panel members next were asked their gender. A quota variable ensured that once a certain number of males or females had completed the survey that excess panel members of either gender were directed the previous message of not fulfilling the criteria of the survey. The research questionnaire used was divided into sixteen sections/questions and was almost exclusively either requesting closed ended responses, and/or

preference ratings on Likert-type scales. Each independent and dependent variable appeared onscreen independently.

**Table 3.1: Variables and Corresponding number of survey items**

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Question 1 Screening question: two items
Question 2 Gender: one item
Question 3 Age: one item
Question 4 Competence: three items
Question 5 Autonomy: three items
Question 6 Relatedness: three items
Question 7 Social Escapism: eleven items
Question 8 Competition: four items
Question 9 Flow: three items
Question 10 Playfulness: fifteen items
Question 11 Enjoyment: three items
Question 16 Qualitative Questions: two items
Question 17 Usage, Gamer Segments & Play Mode: three items
Question 18 Play locations & Game Genre: two items

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### **3.4 Description of Sampling Plan**

This research utilised an existing market research company ‘Research Now’ to recruit respondents. Research Now meets the ethical standards of the Australian Market and Social Research Society (AMSRS). The AMSRS is a not-for-profit professional membership body of over 2,000 market and social research professionals who are dedicated to increasing the standard and understanding of market and social research in Australia. Maintaining consumer trust is integral to effective market and social research. AMSRS, through its Code of Professional Behaviour and guidelines, promotes the highest ethical and professional standards for researchers around the world. Research Now provided a cost effective approach and strong customer support. Subsequently the company invited their panel of potential respondents to take part in the survey. If they chose to do so, they were directed to the survey on the RMIT website. The survey itself was hosted utilizing the Qualtrics software available to university staff and students.

The population of interest for this thesis consisted of Australian based adults over eighteen who owned a smartphone and played video games on them. Quotas were maintained between the two genders in order to provide a sample of statistical relevance when examining gender differences. The administration of the survey began with the qualifying criteria of playing games on smartphones and the establishment of gender followed by a brief description of the project and instructions about how to complete the survey.

Initially respondents were asked two qualifying questions in order to establish their suitability for the survey. Any participants who did not own a smartphone or did not play games on their smartphone were thanked for their time, advised on their suitability and screened out. See Appendix 1.6 for questions. Respondents were advised that their participation was voluntary and confidentiality was assured. See Appendix 1.7.

## **3.5 Data Set**

### **3.5.1 The Independent Variables**

Six initial independent variables were initially considered as drivers for this thesis; the Need for Competence, the Need for Autonomy, the Need for Relatedness, the experience of Flow, Social Escapism and Competition.

### **3.5.2 The Categorising Variables**

Demographics of age and gender and player characteristic of playfulness were considered as categorical antecedent variables for this thesis and were included in the analysis.

### **3.5.3 The Dependent Variable**

In this thesis, the dependent behavioural variable was enjoyment.

### **3.5.4 Descriptive Variables**

Respondents were asked to describe several facets to provide qualitative insights surrounding the findings of the model. Respondents were asked to identify their gaming segment, their smartphone game usage and where they played. Two optional open-ended questions were asked to establish context surrounding the game experience.

### **3.6 Approaches to the Analysis: Preliminary**

The preliminary data analysis of describing, summarising and grouping the data led to undertaking descriptive analysis.

The main study addressed the hypotheses proposed through a quantitative approach tested by two distinct but mutually supporting stages in research analysis. The theoretical foundation of the approach to the analysis is discussed in the next section.

#### **3.6.1 Descriptive Statistics**

Descriptive analysis was undertaken with the aim of providing an understanding of the sample.

Descriptive analysis entailed profiling of the respondents in order to provide a snap shot of who responded to the survey. The aim of this section is to assess the sample is with respect to data gathered outside of the specific conceptual model as well as the demographic characteristics of the respondents. Another aim of the descriptive statistics by means of numerical measures of central location and dispersion was to assess how representative the sample was, with respect to gamer type, age and gender. Descriptive analysis also facilitated hypothesis testing through establishing that in terms of gender and age there was a relatively even split, allowing more accurate testing for differences.

A summary and description of the results is available in chapter four.



### **3.6.2 Factor Analysis**

Factor analysis is a generic term used to describe a number of methods designed to analyse interrelationships within a set of variables or objects culminating in the specification of factors.

#### **Exploratory Factor Analysis**

In multivariate statistics, exploratory factor analysis is a statistical method used to uncover the underlying structure of a set of variables. 'EFA explores the data and provides the researcher with information about how many factors are needed to best represent the data' (Hair et al. 2006, p. 773). EFA can be used when the researcher has no a priori hypothesis about factors or patterns of measured variables and is commonly used by researchers when developing a scale and serves to identify a set of latent constructs underlying an assortment of measured items. In the case of this research items were adapted and examined in terms of a different context (smartphone gaming) and thus EFA was applicable. EFA procedures are more accurate when each factor is represented by multiple measured variables in the analysis. All variables applied to the conceptual model contained at least three distinct items.

EFA requires the researcher to make a number of important decisions about how to conduct the analysis because there is no one set approach. Researchers are faced with numerous decisions when conducting factor analysis and the in general the literature provides inconsistent and inconclusive information in terms of these decisions (Schmitt 2011). In the case of this research, the EFA led to changes in certain constructs and as a result changes in the hypothesis. Exploratory factor analysis (EFA) was used as tool in this an analysis in order to provide operational definitions for descriptive statistics and subsequent regression analysis and also to test the validity and reliability of the proposed measurement instruments. The general purpose of factor analytic techniques is to define the underlying structure of the variables and the primary

purpose of EFA is to define the underlying structure among the variables in the analysis (Hair et al. 2006). The Bartlett test of sphericity tests the null hypothesis that there are no correlations amongst the variables. If the observed significance is small ( $<.05$ ) then the test provides the evidence that the correlation matrix has significant correlations between at least some of the variables (Hair et al. 2006). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is used to compare the magnitude of the observed correlations in relation to the magnitudes of the partial correlation coefficients. Measures less than 0.5 are not suitable for further analysis. All variables were examined using the Varimax rotation method and KMO as 'rotation of the factors improves the interpretation by reducing some of the ambiguities that often accompany initial unrotated factor solutions' (Hair et al. 2006, p. 123). Varimax rotation was chosen as though it is usually the default, there is no compelling analytical reason to choose one method over another (Hair et al. 2006). While factor loadings in the range of .30 - .40 can be considered with a sample size over 350, loadings greater than 0.5 are considered to be practically significant (Hair et al. 2006) and were considered for further evaluation in this research. When the underlying structure of the indicators or number of factors is not well understood, lack of a prior specification in EFA becomes a relative strength (Gerbing & Hamilton 1996). In the case of this research, although the number of factors per latent construct was known and thus specified, EFA was undertaken with the objective of examining underlying factor patterns or factor correlations. Therefore specification of a measurement model developed in part with EFA was particularly relevant for a number of reasons. The PENS scales (Ryan et al. 2006) were adapted to reflect general play as opposed to specific play experiences and as a result warranted further examination. The construct of Social Escapism had included the concept of loneliness, originally theorized as a separate and distinct factor by Korgaonkar and Wolin (1999), yet their findings concerning the construct identified potential limitations in the theorization behind it. All constructs used in the research had previously been examined in contexts separate to the smartphone and mobile application.

In support of this approach, Gerbing and Hamilton (1996) point to the viability of consideration of EFA as a precursor to confirmatory factor analysis (CFA) for both theory development and assessment. Confirmatory methods, then attempt through various model fit indices to optimally match the observed and theoretical factor structures for the data set in order to determine the goodness of fit of the predetermined factor model. This can be seen to represent a middle ground methodology in that it is partly exploratory and partly confirmatory (Lages & Fernandez 2005) and as such can effectively employ EFA as a tool in recovering an underlying measurement model, which can then be evaluated with CFA (Gerbing & Hamilton 1996).

### **Confirmatory Factor Analysis**

Confirmatory factor analysis (CFA) is referred to as the analysis of the measurement model testing theories specified previously to describe the sample data. CFA is considered as theory-testing when a hypothesis is postulated prior to the analysis. In other words, with a CFA model, the exact number of factors and relationships are initially specified from a strong theoretical and/or empirical foundation, in this case post EFA. CFA was employed to test how well the model resulting from the EFA fit the data and to test for convergent validity and discriminant validity.

There were several measures utilized to examine the overall model fit in AMOS 22.0.0. The first  $\chi^2$  value (p value) tests the hypothesis that the model fits perfectly in the population. However there are salient drawbacks to this statistic, including that it is highly sensitive to sample size, and as a result other fit indices are usually relied on more heavily in the evaluation of model fit (Brown 2012). While these other fit indices provide a useful guide, allowing model fit to drive the research process potentially moves away from the original theory testing purpose of the research (Hooper, Coughlin & Mullen 2008). Fit indices may point to a well-fitting model when

in actual fact; parts of the model may fit poorly, while conversely, strictly adhering to recommended cut-off values can lead to instances of the incorrect rejection of an acceptable model (Hooper et al. 2008). It is important to note that there is currently a great deal of debate concerning the validity of approximate fit statistics (Schmitt 2011) and in the case of this research, measures were adapted from Schumacker and Lomax (2004) and Arbuckle (2011). Table 3.2 identifies the model fit measures utilized in this research.

**Table 3.2: Model Fit Measures**

Model Fit Measures and acceptable parameters	Definition
<p><b>Chi-squared test <math>\chi^2</math> value (p value)</b>            Low <math>\chi^2</math> value (relative to df) with sig. level &gt; 0.5            &gt;.05 significance reflects acceptable fit</p>	<p><b>P</b> is the probability of getting as large a discrepancy as occurred with the present sample (under appropriate distributional assumptions and assuming a correctly specified model). That is, <b>P</b> is a “p value” for testing the hypothesis that the model fits perfectly in the population.</p>
<p><b>Cmin/df</b>            Ratios 2 to 1 or 3 to 1            Values close to 1 reflect good model fit. Values &lt; 5 reflect acceptable fit</p>	<p><b>CMIN/DF</b> is the minimum discrepancy, divided by its degrees of freedom. It isn’t clear how far from 1 you should let the ratio get before concluding that a model is unsatisfactory</p>
<p><b>Goodness of fit index (GFI)</b>            Value close to 0.90 reflects a good model fit</p>	<p><b>GFI</b> is the measure of fit between the hypothesized model and the observed covariance matrix.</p>
<p><b>Adjusted Goodness-of-Fit (AGFI)</b>            Value adjusted for <i>df</i>, Value close to 0.90 reflects a good model fit.</p>	<p><b>AGFI</b> corrects the GFI, which is affected by the number of indicators of each latent variable.</p>
<p><b>RMSEA</b>            Value less than 0.05 indicates a good model fit, &lt;.1 reflects a reasonable fit</p>	<p><b>RMSEA</b> avoids issues of sample size by analysing the discrepancy between the hypothesized model, with optimally chosen parameter estimates, and the population covariance matrix</p>
<p><b>Normed Fit Index (NFI)</b>            Value close to 0.90 reflects a good model fit</p>	<p><b>NFI</b> analyses the discrepancy between the chi-squared value of the hypothesized model and the chi-squared value of the null model.</p>
<p><b>Tucker-Lewis Index (TLI)</b>            Value close to 0.90 reflects a good model fit</p>	<p><b>TLI</b> resolves some of the issues of negative bias in the NFI.</p>
<p><b>Comparative Fit Index</b>            Value close to 0.90 reflects a good model fit</p>	<p><b>CFI</b> analyses the model fit by examining the discrepancy between the data and the hypothesized model, while adjusting for the issues of sample size inherent in the chi-squared test of model fit and the NFI</p>

Source: Based on Schumacker & Lomax (2004), Arbuckle (2011).

## **3.7 Approaches to the Analysis: The Main Study**

### **3.7.1 Regression**

For the main analysis of the resulting variables from the factor analysis multiple linear regression analysis was used. In statistics, regression analysis is a statistical process for estimating the relationships between variables. It has the advantage of including many techniques for modelling and analysing several variables, when the focus is on the relationship between a dependent variable and, in this case, six independent variables. Regression analysis is a dependence technique and as such should be used when the independent and dependent have been identified and are metric (Hair et al. 2006). Regression as a technique has been used many times in examining conceptual models and video gaming including the seminal paper for this study (Ryan et al. 2006) as well as many others (Vorderer et al. 2003, Sherry et al. 2006, Przybylski et al. 2009).

Regression analysis helps investigators understand how the typical value of the dependent variable (in this case Enjoyment) changes when any one of the independent variables is varied, while the other independent variables are held fixed. In the case of multiple independent variables the regression is deemed as multiple regressions (Hair et al. 2006) and is used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships. Regression analysis has many techniques for carrying out the analysis and in this case multiple linear regressions was judged most appropriate given the model and pertinent research questions. Linear regression is an approach for modelling the relationship between dependent variable,  $Y$ , and one or more independent variables denoted  $X$ . The case of one independent variable is called simple linear regression. In the case of this research with six independent variables, the process is called multiple linear regression where all variables are examined concurrently.

Regression analysis is the most widely used and versatile dependence technique used in business research and multiple regression analysis is a general statistical technique used to analyse the relationship between a single dependent variable and several independent variables (Hair et al. 2006). Multiple regressions can be seen as a group of techniques that facilitate the exploration of the interrelationships among a set of variables. There are three main types. The standard approach is the most common method and involves all the independent variables being entered into the equation simultaneously in order to test the relationships between the variables and such that each variable can be evaluated in terms of its predictive power over the other independent variables.

Investigations of the univariate distribution of variables did not show any outliers or severe deviations from normality. The same held true for the multivariate distribution of the data. A plot of residual versus predicted values showed the linearity and equal variances assumption to be met and a normal probability plot of residuals indicated that sample scores were normally distributed, giving reason to assume a normal distribution in the population. The value for Mahalanobis' Distance showed that there were no multivariate outliers.

To investigate a series of hypotheses standard multiple regression equations were run, post EFA and CFA, with the independent variables of: The Need for Competence & Autonomy, The Need for Relatedness, the experience of Flow, Competition, Mobile Escapism and Social Arousal. The dependent variable was Enjoyment.

To test the moderation effect of Gender, Age and Playfulness, appropriate procedures were applied according to Aiken and West (1991) to test the potential moderation effect of each potential moderating variable between each of the independent variables and the dependent variable. Dummy variables were created for the categorical variable of gender while the

continuous variables of age and playfulness were centred. Subsequently interaction terms were created and hierarchical regression was used to test for interaction/moderation effects. To test for moderation the interaction effect between each independent variable and requisite moderation variable was examined to see if the effect was significant in predicting the dependent variable, enjoyment. First all variables were standardized to make interpretations easier afterwards and to avoid issues of multicollinearity. Next a regression model was run predicting the dependent variable from the independent variable and the moderating variable. The second stage of the hierarchical model is run with the interaction term added and the results are checked for a significant R<sup>2</sup> change as well as a significant effect by the new interaction term. If both results are significant then a moderation effect can be confirmed as happening

### **3.7.2 Sample Size**

In total, 459 respondents were gathered, with 340 responses being considered valid post data cleaning. The data was screened and according to procedures outlined by Tabachnick & Fidell (1996). Once data collection was finalised, SPSS was used to process and analyse the data. To ensure accuracy of the data, frequency and cross tabulations were produced in the first instance and then inspected for possible errors to screen the data for missing cases. Given that the survey was run online and all questions had to be answered for the completion of the survey, predictably there were no missing variables. Outliers were identified and profiled to ensure extreme values did not influence results. In order to avoid biased results the data set was checked for both univariate and multivariate outliers. Tests for skewness and kurtosis were successfully applied to test the data for normality of distribution.

Meade and Craig (2012) advise that data should be screened after collection through careful analysis. Their study identified that around 15% of respondents engage in sporadic careless

responding and while this study found a careless response rate of 26 % this may be indicative of the use of an online research company where respondents generally respond to a higher level of surveys, reflecting Meade and Craig's (2012) finding that careless responses increase over time. A careful visual analysis of each survey collected identified patterns of negligence including what Meade and Craig (2012) identify as errors of consistency and response patterns.

Previous studies empirically examining video game playing populations have used similar sample sizes with one of the seminal papers (Hsu & Lu 2004) having empirically evaluated their model using survey data collected from 233 users about their perceptions of on-line games. Nysveen et al. (2005) in examining mobile services gathered 201 responses in regards to the gaming component. Further studies such as Prugsamatz et al. (2010) with 170 respondents demonstrate that the 340 respondents utilized in this thesis can be deemed a good size sample. While a recommended minimal sample size applicable in all contexts remains rather elusive (Hair et al. 2006) the sample size for this thesis can be seen as sufficient in terms of answering the research questions posed.

### **3.8 Measurement Instrument**

This section provides definitions and the theoretical background to the psychological constructs hypothesized to drive the enjoyment of mobile gamers. Six constructs function as independent variables. They are the Need for Competence, the Need for Autonomy, the Need for Relatedness, the experience of Flow, Social Escapism and Competition. The dependent variable is Enjoyment. The demographic variables of age, gender as well as player's playfulness were examined for their impact on the overall model. Several other aspects of respondent's play experience were also examined as part of the exploratory process. The questionnaire was initially designed to filter out respondents who didn't fulfil the criteria of playing smartphone games. Subsequently



respondents were prompted screen by screen to answer questions as detailed previously in Table 3.1.

### **3.9 Scale Development**

This section develops exploratory scales and adapts existing scales from the literature to be situated specifically in the smartphone play experience relevant to this research.

#### **3.9.1 Player Experience of Need Satisfaction (PENS)**

Ryan et al. (2006) derived and developed the PENS scales from SDT. Apart from the original study which developed, tested and validated the scales across several studies (Ryan et al. 2006), the scales have been tested and validated in several alternative studies (Johnson & Gardner 2010, Tamborini et al. 2010, Tamborini et al. 2011, Peng et al. 2012, Reinecke et al. 2012). Some studies have been experimental and have tested the scales directly after a play experience while other studies have asked respondents to recall a recent play experience. Przybylski et al. (2010) identified that the original studies found ‘that psychologically satisfying experiences of play were a robust predictor of motivation and well-being across individuals and across the varied game contents and narratives’ (p. 157). Yet Johnson and Gardner (2010) identified variation in types of need satisfaction across game genres. Given that this research intends to situate findings in generic antecedents and outcomes of mobile game play rather than genre specific findings the PENS scales has been adapted and can be seen in Table 3.3. Adaptations were made in order to reflect general experiences of gameplay situated specifically on smartphones. Respondents rated their level of agreement to each item using a 7-point Likert scale (1= Do Not Agree, 7=Strongly Agree).

**Table 3.3 PENS Items**

---

Original	Adapted
“Reflect on your play experiences and rate your agreement with the following statements:”	“Reflect on your <b>smartphone</b> play experiences and rate your agreement with the following statements:”
<b>The Need for Competence</b>	
1.I feel competent at the game	I feel competent at games on my phone.
2.I feel very capable and effective when playing.	I feel very capable and effective when playing games on my phone.
3. My ability to play the game is well matched with the game's challenges.	My ability to play phone games is well matched with the games' challenges
<b>The Need for Autonomy</b>	
1.The game provides me with interesting options and choices	1. The games I play on my phone provide me with interesting options and choices
2.The game lets you do interesting things	2. The games I play on my phone let you do interesting things
3.I experienced a lot of freedom in the game	3. I experienced a lot of freedom in the games I play on my phone.
<b>The Need for Relatedness</b>	
1. I find the relationships I form in this game fulfilling.	1. I find the relationships I form in games on my phone fulfilling.
2. I find the relationships I form in this game important.	2. I find the relationships I form in games on my phone important.
3. I don't feel close to other players. (-)	3. I don't feel close to other players in games on my phone. (-)

---

### 3.9.2 The experience of Flow

Originally adapted and validated for examining the online experience of consumers (Novak et al. 2000) the flow construct has more recently been tested and validated in terms of online gaming (Hsu & Lu 2004). A narrative description of flow is offered and subsequently respondents answer questions on the experience. Both the narrative descriptive and three item scales have been adapted from Hsu and Lu (2004) to reflect the smartphone gaming experience, see table 3.4. As with both previous studies respondents rated their level of agreement to each item using a 7-point Likert scale (1= Do Not Agree, 7=Strongly Agree).

**Table 3.4 The experience of Flow items**

Original	Adapted
<p>Flow experience</p> <p>Instructions: The word “flow” is used to describe a state of mind sometimes experienced by people who are totally involved in some activity. One example of flow is the case where a user is playing extremely well and achieves a state of mind where nothing else matter but the on-line game; you engage in an on-line game with total involvement, concentration and enjoyment. You are completely and deeply immersed in it. The experience is not exclusive to an on-line game: many people report this state of mind when web page browsing, on-line chatting and word processing. Thinking about your play of the <b>on-line game</b>.</p> <p>1.Do you think you have ever experienced flow in playing an on-line game.</p> <p>2.In general, how frequently would you say you have experienced “flow” when you play an on-line game.</p> <p>3.Most of the time I play an on-line game I feel that I am in flow.</p>	<p>Flow experience</p> <p>Instructions: The word “flow” is used to describe a state of mind sometimes experienced by people who are totally involved in some activity. One example of flow is the case where a user is playing extremely well and achieves a state of mind where nothing else matter but the video game; you engage in a video game with total involvement, concentration and enjoyment. You are completely and deeply immersed in it. The experience is not exclusive to video games: many people report this state of mind when web page browsing, on-line chatting and word processing. Thinking about your play of <b>smartphone games</b>.</p> <p>1.Do you think you have ever experienced flow in playing a game on your smartphone?</p> <p>2.In general, how frequently would you say you have experienced “flow” when you play a smartphone game.</p> <p>3.Most of the time I play a smartphone game I feel that I am in flow</p>

### 3.9.3 Social Escapism

The social escapism motivation (Korgaonkar & Wolin 1999) was not adapted, with the exception of items six and ten, refer to table 3.5 for details. Item six ‘So I can forget about work’ was adapted to include ‘or study’ in order to include any students who may not be in employment. Item ten was adapted from ‘I do not like to surf the web alone to ‘I do not like to play games alone’ in order to fit the context. The scale was prefaced with ‘I play games on my smartphone’. Respondents rated their level of agreement to each item using a 7-point Likert scale (1= Do Not Agree, 7=Strongly Agree).

**Table 3.5 Social Escapism items**

Original	Adapted
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.	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 surf the web alone.	10. I do not like to play games alone
11. Because it takes me to another world.	

### 3.9.4 Competition

The competition scales were not adapted for this research as they already reflected the video game experience and can be found in table 3.6. The statements were prefaced by ‘When playing games on my smartphone’. Respondents rated their level of agreement to each item using a 7-point Likert scale (1= Do Not Agree, 7=Strongly Agree) (Greenberg et al. 2010).

**Table 3.6 Competition items**

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

### 3.9.5 Dependent Variable – Enjoyment

The enjoyment construct utilized throughout research based on the PENS scales has been adapted from the Intrinsic Motivation Inventory (Ryan, Mims & Koestner 1983, Ryan et al. 2006) and is shown in table 3.7. Respondents rated their level of agreement to each item using a 7-point Likert scale (1= Do Not Agree, 7=Strongly Agree).

**Table 3.7 Enjoyment items**

Original	Adapted
I enjoyed doing this activity very much	I enjoy playing games on my phone
This activity was fun to do	Playing games on my phone is fun to do
I thought this was a boring activity (Reverse scored)	I think playing games on my phone is a boring activity(r)

### 3.9.6 Playfulness

The Young Adult Playfulness Scale has been utilised as ten item Likert scale ranging from ‘a little’ through to ‘a lot’ (Barnett 2007, Barnett 2011, Qian & Yarnal 2011, Barnett 2012). In order to prepare respondents to answer questions about their personality the following statement appeared before the questions;

‘The next section will ask you to rate certain aspects of your personality on a scale from one to ten. Please think about each answer carefully as it applies to you in comparison to other people’. Based on how the previous studies had utilised the scale respondents were subsequently asked to ‘Please rate yourself on how the following characterises you’. The young adult playfulness scale consists of four factors, gregarious, uninhibited, comedic and dynamic. The items representing each factor are used to examine respondents overall playfulness as a mean score and are in table 3.8.

**Table 3.8 Playfulness items**

Playfulness Components	Items used
Gregarious	Cheerful, Happy, Friendly Outgoing, Sociable
Uninhibited	Spontaneous, Impulsive, Unpredictable, Adventurous
Comedic	Clowns Around, Jokes/Teases, Funny, Humorous
Dynamic	Active, Energetic

### 3.9.7 Demographics

Table 3.9 shows the items for demographics.

**Table 3.9 Demographic items**

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Gender: Respondents were asked to choose their gender; male or female  
Age: Respondents were asked to choose their year of birth.

---

### 3.9.8 Exploratory Scales

A number of measures were designed to explore the play experience outside of the conceptual model in order to situate the results in an appropriate play paradigm.

#### Gamer Segments

Adapted from Prugmatz et al. (2010) where ‘respondents were asked to classify themselves by degree of involvement/usage: ‘Which best characterizes the extent you play video or computer games? Non-gamer, casual gamer, hard-core gamer’ (p. 385) and can be found in table 3.10. This device was intended as part of the descriptive statistics to ensure that the population did not consist of any one particular type of player. Juul (2012) identifies the casual player as the most common type of gamer.

**Table 3.10 Gamer Segments**

---

Please describe your gamer status, apart from on your phone  
Non-Gamer; I only play on my phone  
Casual Gamer; I sometimes play on other devices  
Hardcore Gamer; I play games a lot on different devices

---

## Usage

Terlutter and Capella (2013) characterise mobile gaming as being by 'higher playing frequency but shorter playing times with more interruptions and more distractions' (p99). Therefore to measure usage, a Frequency of Use Scale (FUS) was adapted from Kano, Horton and Read (2010), see table 3.11. The scale was originally used to measure the computer usage of children and was designed with simplicity in mind. This reflects the fact that mobile game playing is quite contextual in nature and varies according to situations. The usage variable was not intended as part of the overall model and was utilized as a conceptual discussion point. This reflects the faults established with reported self usage as a dependable measure. Recent research by Kahn et al. (2014) empirically validates self use as a flawed measure in terms of accurate outcome of technology usage due to a myriad of factors. The previously established characteristics inherent in mobile games indicated that a total usage variable would prove difficult to accurately predict. Indeed in comparing categorical self-report and log data of mobile use data (Boase & Ling 2013) found that asking respondents to estimate how often they use their mobile phones fared better than the continuous self-report measure asking to estimate their mobile phone activity.

While various alternative studies have utilised usage variables such as intention to use (Hsu & Lu 2004, Nysveen et al. 2005) this research is not seeking to establish usage patterns as an important consideration but instead based on arguments previously established in the literature review utilizes enjoyment as the dependent variable.

**Table 3.11 Usage item**

---

How often do you play games on your smartphone?

Once a month

Once a week

A few times a week

Once a day

A few times a day

Continuously throughout the day

---

## **Location**

Given the potentially mobile nature of smartphone gaming, to examine where people play games, a scale for measuring social media use was utilised from the Yellow Pages; 2012 Social Media Report (Sensis 2013). This measure was used as it represented a measure currently in use in actual industry reports and is shown in table 3.12.

**Table 3.12 Location items**

---

Where do you play games on your smartphone? Please tick all that apply

At home

At work or university

Restaurants, bars or parties

Public Transport

In the car

---

## **Play Mode (Multiplayer – Singleplayer)**

Games can be single player or multi player (McGonigal 2011) and Hainey, Connolly, Stansfield and Boyle (2011) identified that the distinction between single and multiplayer games is an important aspect in any research seeking to understand the motivations of games.

Given the social nature of some of the constructs this item was developed to examine any potential distinctions and named play mode, see table 3.13.



**Table 3.13 Play mode items**

---

Games can be identified as either Single-player (Where you play by yourself) or Multi-player (Where you play with other people or connect through a social platform such as Facebook). Please identify your playing habits in regards to splitting your time between the two.

Multiplayer only

Mostly multiplayer and some Singleplayer

Multiplayer and singleplayer

Mostly Singleplayer and some multiplayer

Singleplayer only

---

## **Game Genre**

Kim (2013) points to a problem of genre classification in terms of mobile games. Genre classification is difficult in terms of game characteristics. Many games in the mobile market display characteristics of many genres, and are situated simultaneously in different categories. Added to this is the fact that the two main App stores iOS and Google play have different categorizing schemes (Kim 2013). Video games and genre definition tax the current comprehension of object-bound disciplines (Arsenault 2009) and there are currently no academically rigorous classifications of mobile game genres. Video game genres can be understood as the codified usage of particular mechanics and game design patterns to express a range of intended play-experiences (Arsenault 2009). As a result this research identified and categorized five main categories of games using the Google Play Store. Sports & racing represent traditional sporting games played as video games. Brain & Puzzle represent the archetypal smartphone game. Arcade & Action represents more action orientated faster games. Strategy, Simulation & Role Playing Games, represent the more complicated involving games found on smartphones. Cards & Casino games represent traditional games played on smartphones. Each category represented an intended play experience heuristic. Similar to Greenberg et al. (2010) examples were given for each category and respondents were asked to tick all that apply, see table 3.14.

**Table 3.14 Game Genre**

---

Which games do you play? Please tick all that apply.

Sports & Racing (examples; Golf, Soccer, Basketball, Rugby, Tennis, Need for Speed, Fearless Wheels, Fifa 2013, Madden 2013)

Brain & Puzzle (examples; Words with Friends, Draw Something, Bejeweled, Tetris, Cut the Rope, Sudoku, Crossword, Chess, Scribblenauts, Trivia)

Arcade & Action (examples; Angry Birds, Temple Run, Fruit Ninja, Plants vs Zombies, Pinball, Call of Duty)

Strategy, Simulation & Role Playing Games (examples; Sims, Minecraft, Simcity, Farmville, Mafia Wars, Civilisation, Command & Conquer, Worms)

Cards & Casino (examples; Poker, Texas Holdem, Bingo, Blackjack, Slot, Solitaire, Baccarat)

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## Exploratory Items

### Why Play Games?

Based on characteristics of mobile gaming identified in the literature (Sotimaa 2002, Li & Counts 2007, Hjorth & Richardson 2009) two exploratory items were developed to situate the conceptual model within a framework of the contextual reasons why people actually play games. This was done to establish that the conceptual model was situated within the traditional mobile play paradigm as well as seek fresh perspectives on the phenomenon, see table 3.15.

Both questions were open response questions and marked as optional. This was to ensure more honest responses and given the nature of the questions asked, full response rates were not required. The data collected was coded and several themes were identified and are discussed in Chapter four.

**Table 3.15 Qualitative items**

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'Where or when do you play games on your phone?'

'Why do you play games on your phone?'

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### **3.10 Data Collection**

Data collection was administered between the twenty seventh of June and the tenth of July 2013. The survey was designed and hosted utilising the Qualtrics survey hosted on the RMIT University website. Correspondence was maintained with the relevant market research company, Research Now to ensure surveys were distributed to eligible participants. The survey was closed once the relevant budget quotas were met. Initially 459 responses were collected. Data cleaning resulted in 340 valid responses remaining. To ensure accuracy of the data, frequency and cross tabulations were produced in the first instance and then inspected for possible errors to screen the data for missing cases. Outliers were identified and removed to ensure extreme values did not influence results.

## Chapter 4

# CONSTRUCT MEASUREMENT & DATA ANALYSIS

### 4.1 Introduction

This chapter performs a number of functions. Firstly it profiles the respondents. Profiling of the respondents provides a snap shot of who responded to the survey. The aim of this section is to assess how representative the sample is with respect to an examination of the model and to provide an understanding of the sample through examining distributions of the behavioural and demographic variables.

Secondly Exploratory Factor analysis (EFA) is conducted to examine the constructs. Specifically the EFA was used to provide operational definitions of the constructs in order to examine the data appropriately in the context of mobile gaming. The subsequent Confirmatory Factor Analysis confirmed the validity of these scales. Hypotheses were reformulated on the basis of the outcomes of these procedures.

Finally, the proposed hypotheses were tested using a linear multiple regression approach. The results of the analysis inform the discussion and implications in chapter five.

### 4.2 Profile of Respondents

The variables of age, gender, gamer segment and preference for single or multiplayer play were used to profile respondents. There were 340 valid respondents in total, consisting of 171 males (51.1%) and 169 females (48.9%). There is no strict consensus established in any literature regarding the strict definition of generational gaps and generally approximations are used to delineate the differences between Generation Y, Generation X and Baby Boomers. 'Baby Boomers are people born between the years of 1945-1964, a cohort that has been the source of many important cultural and economic changes. Generally, it is accepted that the Xers are people

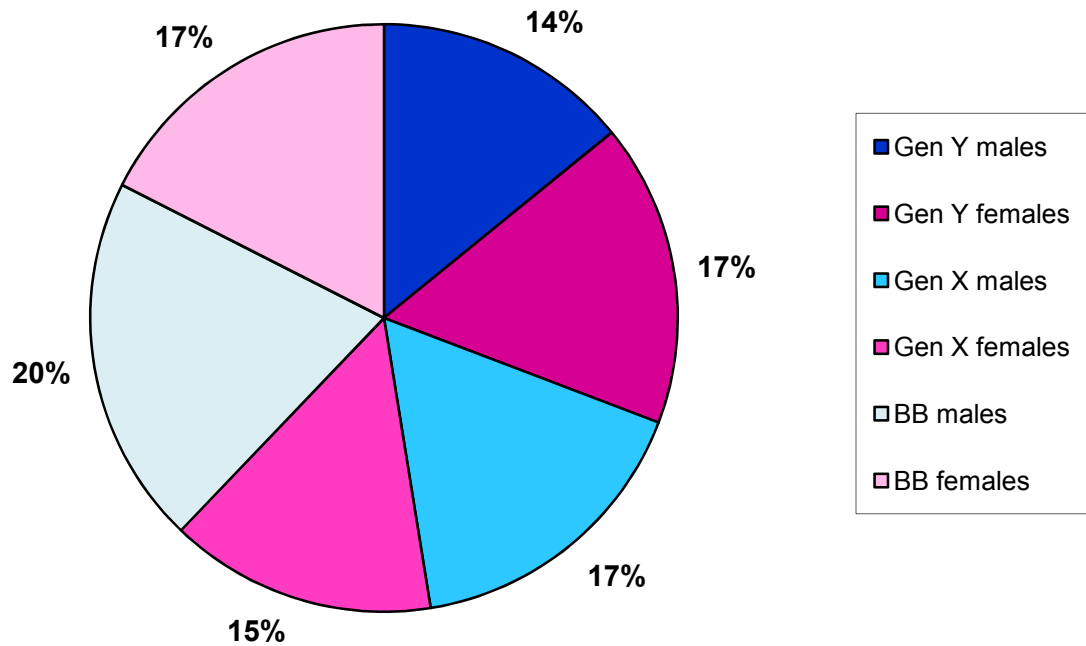
who were born between 1965 and 1980. The Y Generation or the ‘dot com’ generation are people who are born after 1980’ (Yu & Millar 2005 p2). Given that the Young Adult Playfulness Scale (Barnett 2007) was utilised to measure playfulness in adults aged thirty and under in previous research, the first segmentation by age was those aged between eighteen and thirty given that this sample satisfied existing criteria for this measure. These respondents have been labelled Generation Y. The cohort aged between thirty one and forty five have been labelled as Generation X and given that recently Baby Boomers have been identified in the literature as those aged forty five and older (Feijoo et al. 2012) all respondents over forty six and older are labelled as Baby Boomers for the purpose of this research.

The average age of respondents was 40, with the youngest respondent being 18 and the oldest 74. This wide age range can be seen as reflective of the fact that the rise of the smartphone and subsequently mobile gaming has led to a larger penetration of gaming where ‘Baby Boomers (aged 45 and older) increased their video game playing via mobile devices’ (Feijoo et al. 2012 p 218). Breaking this down into the three distinct generational groups it is evident that there are one hundred and three Generations Y (30%), one hundred and nine Generations X (32%) and the largest cohort are the Baby Boomers at one hundred and twenty eight respondents (38%).

Breaking these generations down further by gender, see figure 4.1, there is a relatively even split between the genders for each age cohort giving a relatively workable base from which to examine any potential differences for the predicted influential variables of age and gender.

**Fig 4.1 Age and Gender breakdown of respondents**

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### **4.2.1 Playfulness**

The construct of playfulness was established in the EFA (section 4.2.2) and confirmed using CFA (section 4.3.2). The measure was found to have an acceptable goodness of fit and as a result, the mean score of the fifteen items was used as the measure of the construct, similar to previous studies (Barnett 2010, Qian & Yarnal 2011). Similar to the age construct, the variable was divided into three distinct levels of low, medium and high playfulness in order to frame it as a categorical variable (Table 4.1).

In exploring the question; *“Is the Young Adult Playfulness scale suitable for use with adults older than thirty”* a chi square test for relatedness with the scale and generation segments, showed a Pearson chi square of 7.463 with a probability of .133. The significance value was well

above the alpha value of 0.05 and is therefore not significant. This demonstrates that the Young Adult Playfulness scale is suitable for use for all ages identified in this research.

**Table 4.1 Playfulness by age**

		Age/Generations				
		Total	Gen Y	Gen X	Boomers	Total
Playfulness	Low Play	118	32	39	47	118
	Med Play	105	27	41	37	105
	High Play	117	44	29	44	117
Total		340	103	109	128	340
Percent		100	30.3	32.1	37.6	100
$\chi^2 (2)(N=340) = 7.463 (p = 0.133)$						

A chi square test was also performed to test for relatedness in this construct in terms of gender with a resulting Pearson chi square of 0.645 and a probability of .742. That the significance value was above the alpha value of 0.05 and is not significant, re-enforces previous findings (Barnett 2007, Qian & Yarnal 2011) that the scale is suitable for use across genders, see table 4.2.

**Table 4.2 Playfulness by Gender**

		Gender				
		Total	Males	Females	Total	
Playfulness	Low Play	118	59	59	118	
	Med Play	105	50	55	105	
	High Play	117	62	55	117	
Total		340	171	169	340	
Percent		100	50.3	49.7	100	
$\chi^2 (2)(N = 340) = 0.645 (p = 0.742)$						

### 4.3 Exploratory Descriptives

Gamers were also asked to identify the types of games they played, single or multiplayer or a combination. One hundred and twenty one respondents identified as exclusively playing single player while two hundred and nineteen played some form of multiplayer. Only four players reported exclusively playing multiplayer games. As a result the sample was split into separate

potential cohorts for analysis; exclusively single player and multiplayer. This may have implications for the independent variables of the need for relatedness and competition, both of which are directly linked to multiplayer gaming. The older Baby Boomer Generation were more likely to play single player games only. Terlutter and Capella (2013) regard the question of single-player or multiple-player as a basic distinction in terms of mobile games. Chi square tests were performed to examine relatedness between game mode and age, gender and playfulness. In terms of age a resulting Pearson chi square of 11.442 and a probability of .003 suggested that there is a significant relationship between age and the choice of single player or multiplayer, see table 4.3. This relationship was not significant in terms of gender with a Pearson chi square of 1.760 and a significance of .185. Similarly there was no significant relationship between playmode and playfulness with a Pearson chi square of 4.655 and significance of .098. This indicates that older players may be less likely to be involved in social multiplayer play experiences on their smartphone but gender or playfulness does not influence this preference.

**Table 4.3 Age and playing preferences**

		Age/Generations				
		Total	Gen Y	Gen X	Boomers	Total
Play mode	Single player	121	29	32	60	121
	Multi player	219	74	77	68	219
Total		340	103	109	128	340
Percent		100	30.3	32.1	37.6	100
$\chi^2 (2)(N =340) = 11.442 (p =0.003)$						

### 4.3.1 Gamer Segments

Respondents were asked to classify themselves by their gaming habits outside of their phone gaming. Sixty two percent classed themselves as casual gamers that sometimes play games on different devices while seventeen percent would consider themselves hardcore gamers and twenty one percent only play games on their phones and identify as non-gamers. This reflects the



previously established view that while mobile gamers are a heterogeneous group (Penttinen et al. 2012) the majority of mobile gaming can be seen as casual. Juul (2012) identifies this player as the most common and a 'stereotypical casual player has a preference for positive and pleasant fictions, has played few video games, is willing to commit small amounts of time and resources toward playing video games, and dislikes difficult games' (p. 29). This has implications in that it re-enforces that the responding sample is relatively representative of mobile gamers and perhaps the shifting demographics of gamers in general.

Chi square tests were performed to examine if age, gender, playfulness and play mode had a significant relationship with gamer segments. Gender, with a Pearson chi square of 5.347 and a probability of .069 and playfulness, with a Pearson chi square of 0.827 and probability of .935 were not found to have a significant relationship. A Pearson chi square of 10.947 and a probability of .027 demonstrated that age did have a relationship with gamer segments, see table 4.4. Play mode with a Pearson chi square of 9.582 and a probability of .008 did have a significant relationship with gamer segments indicating that multiplayer on smartphones is preferred more by casual and hardcore players. Table 4.5 shows the breakdown of gamer segments in percentages. Most notably Generation Y, males and those who played multiplayer games were most likely to class themselves as hardcore gamers. While Baby Boomers, females and those who only played single player, were least likely to class themselves as such. While this reinforces certain stereotypical assumptions, it also demonstrates that age, life-cycle, technological advances and traditional gender activities may influence people's gaming activities overall. However it still points to a dramatic shift from the young males as the only gamer segment worth considering as the archetypal consumer of video games.

**Table 4.4 Gamer Segments by age**

		Age/Generations				Total
		Total	Gen Y	Gen X	Boomers	
Gamer Segments	Non-Gamer	70	18	25	27	70
	Casual Gamer	212	58	66	88	212
	Hardcore Gamer	58	27	18	13	58
Total		340	103	109	128	340
Percent		100	30.3	32.1	37.6	100

$\chi^2 (4) = 10.947, p = .027$

**Table 4.5 Gamer Segments by playmode**

		Game Mode			Total
		Total	Single	Multi	
Gamer Segments	Non-Gamer	70	34	36	70
	Casual Gamer	212	74	138	212
	Hardcore Gamer	58	13	45	58
Total		340	121	219	340
Percent		100	35.6	64.4	100

$\chi^2 (2) = 9.582, p = .008$

### 4.3.2 Game Genres/Choice of Games

Players were offered five game genres/categories and asked to select which they played. Overall Brain & Puzzle games were by far the most popular choice with 87.1% of respondents playing these games.

#### Male & Female game genres.

There were significant differences between males and females in terms of two game genres shown in table 4.8. Brain & Puzzle  $\chi^2 (1) = 10.174, p = .001$  and Sports & Racing  $\chi^2 (1) = 59.906, p = .000$ .

Greenberg et al. (2010) when exploring console genre preferences found that for males the most preferred genres were physical games such as action, racing, or sports while for females more traditional games such board games or puzzles were preferred. This research in terms of the smartphone supports these findings to a certain extent as on this platform, as more males play sports & racing games while more females play puzzle & brain games.

There were significant differences for Arcade & Action  $\chi^2(2) = 10.557, p = .005$ , Strategy, Simulation & Role-playing Games  $\chi^2(2) = 24.646, p = .000$ , Sports & Racing  $\chi^2(2) = 12.444, p = .002$  and Cards & Casino  $\chi^2(2) = 22.166, p = .000$ .

**Table 4.6 Game Genre by Gender**

Segment	Brain & Puzzle %	Action & Arcade %	Strategy, Sim & RPG %	Sports & Racing %	Cards & Casino %
Overall	87.1	59.7	44.1	30	52.4
Male	81.3	64.3	46.8	49.1	50.9
Female	92.9	55	41.4	10.7	53.8

### Age and Game Genres

Kim (2013) has observed that younger players may be more interested in more complex games on mobile while older players may prefer more casual games such as puzzle games to pass the time. While all generations play Brain & Puzzle games, the older Baby Boomers generations are less likely to play quick reaction Arcade & Action or complicated Strategy, Simulation and RPG games or Sports & Racing Games, see table 4.9. Instead the older generations are more likely to play traditional Card & Casino games with Baby Boomers by far the most likely to play the traditional games in video game format, reflecting Kim's (2013) assertion that the older the player, the less likely they are to play complicated game genres.

**Table 4.7 Game Genre by Age**

Segment	Brain & Puzzle %	Action & Arcade %	Strategy, Sim & RPG %	Sports & Racing %	Cards & Casino %
Overall	87.1	59.7	44.1	30	52.4
Gen Y	83.5	60.2	35.9	35.9	41.7
Gen X	87.2	47.7	37.6	37.6	43.1
Baby Boomers	89.8	28.1	18.8	18.8	68.8

**Playfulness and Game Genres**

The Playfulness construct was examined and established in the EFA and CFA (See sections 4.4 and 4.5). In terms of playfulness there are significant differences for Sports & Racing  $\chi^2 (2) = 12.365, p = .002$ , Strategy, Simulation & RPG games  $\chi^2 (2) = 6.877, p = .032$  and Cards & Casino games  $\chi^2 (2) = 9.152, p = .010$ , see table 4.10. Those of low playfulness were less likely to play the more complicated genre of Strategy, Simulation & RPG games or the more traditional Sports & Racing Games. This may indicate that those of higher levels of playfulness are more willing to invest time and effort into smartphone games and may naturally have more affinity for traditional sports games, played outside of traditional arenas, on smartphones. Those of high playfulness were much more likely to play Cards & Casino games.

**Table 4.8 Game Genre by Playfulness**

Segment	Brain & Puzzle %	Action & Arcade %	Strategy, Sim & RPG %	Sports & Racing %	Cards & Casino %
Overall	87.1	59.7	44.1	30	52.4
Low Playfulness	89.8	59.3	34.7	18.6	44.1
Med Playfulness	83.8	61	51.4	32.4	49.5
High Playfulness	87.2	59	47	39.3	63.2

**Gamer Segments and Game Genre**

Differences were found for Sports & Racing  $\chi^2 (2) = 10.889, p = .004$ , Arcade & Action  $\chi^2 (2) = 26.105, p = .000$ , and Strategy, Simulation & RPG games  $\chi^2 (2) = 25.698, p = .000$  and a full break down can be seen in table 4.11. Interestingly non gamers and hardcore gamers were much

more likely to play sports games than casual gamers. This may indicate that there may be a number of non gamers who use their smartphones to play sports and racing games that they are familiar with. The more hardcore a player, the more likely they were to play fast paced Arcade & Action games or complicated Strategy, Simulation & RPG games, thus supporting the original classification of these gamer segments.

**Table 4.9 Game Genre by Gamer Segments**

Segment	Brain & Puzzle %	Action & Arcade %	Strategy, Sim & RPG %	Sports & Racing %	Cards & Casino %
Overall	87.1	59.7	44.1	30	52.4
Non-Gamer	87.1	40	24.3	14.3	40
Casual Gamer	88.2	59.4	43.9	33	55.7
Hardcore Gamer	82.8	84.5	69	37.9	55.2

### 4.2.3 Usage (Frequency of Use)

In order to examine potential differences for usage, the Mann-Whitney U test was utilised to examine the continuous usage variable in terms of differences with categorical variables of two categories while the Kruskal-Wallis test was utilised to examine differences for categorical groups with three categories. The null hypothesis that ‘The distribution of usage was the same across categories’ was rejected if the p-value < 0.05 and supported if the p-value > 0.05.

In order to test for differences between the usage variable and gender a Mann-Whitney U test was run. The result was a rejection of the null hypothesis that ‘The distribution of usage was the same across categories of gender’,  $p = .007$ . Therefore there were differences across the distributions of usage in terms of males and females. Similarly a Mann-Whitney U test was run to test for relatedness between usage and play mode which rejected the null hypothesis that ‘The distribution of usage was the same across categories of play mode’,  $p = .000$ .

To test for categorical variables with more than two separate groups Kruskal-Wallis tests were utilized. The null hypothesis that ‘The distribution of usage was the same across categories of playfulness’ was supported,  $p = .246$ . Similarly the null hypothesis that ‘The distribution of usage was the same across categories of age’ was also supported,  $p = .173$ . For gamer segments there were differences across the distributions of usage as the null hypothesis that ‘The distribution of usage was the same across categories of gamer segment’ was rejected,  $p = .004$ .

These results demonstrate that while playfulness and age do not impact the usage variable, gender, gamer segments and play mode do. Single players are more frequent players than their multi player counterparts while hardcore gamers reflect their love of gaming through playing games on their smartphone more frequently than non or casual gamers. Previous game studies have generally established that males play more (e.g Greenberg et al. 2010), but in the context of this research, females can be seen as more frequent players of smartphone games.

#### **4.2.4 Play Locations**

Players were also asked where they played games with the most common response being At Home followed by Public Transport. This is illustrated in table 4.14.

Chi square analysis was applied to test for any potential differences between the various segments in terms of where they played. Males were more likely than females to play smartphone games at work  $\chi^2 (1) = 4.412, p = .036$  while female respondents were more likely to play games in the car  $\chi^2 (1) = 18.964, p = .000$ . Players of medium playfulness were more likely than those of low playfulness to play on public transport while highly playful people were even more likely to play here  $\chi^2 (2) = 8.091, p = .018$ . In terms of age, on Public Transport, Generation Y were the most likely to play here followed by Generation X while Baby Boomers were unlikely to play here  $\chi^2 (2) = 7.595, p = .022$ . This may be indicative of choice of transport

changing through the life cycle or Baby Boomers being embarrassed to play in public. In terms of at work or university there were similar results with Generation Y were the most likely to play here followed by Generation X while Baby Boomers were highly unlikely to play in this environment  $\chi^2(2) = 21.082, p = .000$ . On Public Transport non gamers were unlikely to play, casual players more likely to play and hardcore gamers the most likely to play  $\chi^2(2) = 9.361, p = .009$ . It was a similar experience at work or university with non gamers were unlikely to play, casual players more likely to play and hardcore gamers the most likely to play in this context  $\chi^2(2) = 23.783, p = .000$ . Where players play games on their smartphones can be seen as contextually based and varied according to player characteristics.

#### **4.2.5 Enjoyment**

To investigate how enjoyment potentially varied by age, gender, playfulness, play mode and gamer segment, Mann Whitney U tests and Kruskal-Wallis tests were run to examine any potential differences. The Mann Whitney U (Wilcoxon Rank-Sum Test) test is nonparametric and thus is suitable in the case of the categorical populations being examined here. As a non parametric test it preserves the Type I error rate to nominal alpha regardless of the population shape and has a fundamental advantage over its parametric counterpart the *t* test, which relies on the normality distribution assumption (Salkind 2006) The Mann Whitney test can prove three to four times more powerful for sample sizes such as in psychology (Salkind 2006) and utilised in this thesis.

In order to test for differences between the dependent variable of enjoyment and gender a Mann-Whitney U test was run. The result was support of the null hypothesis that ‘The distribution of enjoyment was the same across categories of gender’,  $p = .074$ . Similarly a Mann-Whitney U test was run to test for differences between enjoyment and play mode which supported the null

hypothesis that ‘The distribution of enjoyment was the same across categories of play mode’,  $p = .090$ .

To test for categorical variables with more than two separate groups Kruskal-Wallis tests were utilized. The null hypothesis that ‘The distribution of enjoyment was the same across categories of playfulness’ was rejected,  $p = .015$ . The null hypothesis that ‘The distribution of enjoyment was the same across categories of age’ was however supported,  $p = .391$ . For gamer segments the null hypothesis that ‘The distribution of enjoyment was the same across categories of gamer segment’ was rejected,  $p = .048$ .

This indicates that the more players are involved with video games separate to their smartphone, the more they enjoy games, supporting that hardcore gamers really enjoy video games. Similarly, the more playful a person the more likely they will enjoy smartphone games. This represents an important finding in that it is the medium and highly playful people who actively enjoy the games they play more, while gender and age does not influence enjoyment.

### **4.3 Qualitative Data Analysis**

In order to provide the importance of context when playing games on smartphones, two questions were posed. The responses to these questions supported the literature on mobile gaming and also provided a key insight that mobile gaming is now situated in the home as well as being an ever accessible device used while away from home.

#### **4.3.1 Where or when do you play games on your phone?**

For this question there were four main themes identified; Home, Travelling, Waiting/Bored and at Work or University. At home was by far the most common response reflecting the fact that ninety two percent of respondents play on their phones at home, see Table 4.10.



**Table 4.10 Where or when to play**

Where or When?	Examples
At Home	In bed at night Home in the evening Home - when winding down Mostly at home Home, watching tv
Travelling	On the way to shopping On the bus, train, in the car Public Transport On the bus, train, in the car
Waiting/Bored	Hospital and doctors waiting rooms When waiting for appointments meetings etc While waiting in the car While waiting for something (public transport, appointment, etc)
Work/University	At work in my breaks University Lunch times at work or slower times At work
Combinations of all	At home and on the train to and from work. During my lunch break At home because there is nothing on tv and Waiting in the car for school to come out At home, Food Courts, Doctor's waiting rooms, in the car (as passenger). At home,waiting for a tv show to start,or waiting to pick the kids up from school Public transport and whilst waiting for friends/events

### 4.3.2 Why do you play games on your phone?

Being bored or using games to pass time was the most common response followed by for fun or enjoyment. There were several responses for mental stimulation while the sheer convenience was reason enough for some players. There were a few responses directly linked to social reasons but this was the least utilised reasoning. Table 4.11 shows some examples of the responses gathered.

**Table 4.11 Why play games**

Why do you play?	Examples
Bored or to Pass Time	<p>something to do to pass the time</p> <p>Pass the time at work</p> <p>Boredom</p> <p>Keep me occupied when I am waiting, take a quick break, re-focus</p> <p>To fill in time, while waiting, or on break</p> <p>pass the time, need to be doing something all the time</p> <p>something to do to pass the time</p>
Fun/Enjoyment	<p>Pure enjoyment. It is nice to spend a small amount of time doing something fun removed from my every day routine.</p> <p>Because I enjoy it and always try to beat my last score</p> <p>Entertainment</p> <p>I just like to play</p> <p>Convenient &amp; fun</p>
Mental Stimulation	<p>To keep my mind alert</p> <p>To keep my brain active</p> <p>I love doing puzzles, word games, etc. because they stimulate my brain</p> <p>Brain games</p> <p>I like games that make me think ,the smartphone allows me to play multiple games of that nature e.g.. I currently have 21 live words with friends games</p>
Convenience	<p>Because when i'm studying i need a break</p> <p>Because my phone is always with me</p> <p>Because I can play it anywhere even in bed</p> <p>It's portable</p>
Social Reasons	<p>Connect with friends</p> <p>I enjoy playing some games with family and friends- helps me feel close to them.</p> <p>I have enjoyed meeting new people and have even met up with the in real life, the games gave us something in common</p> <p>I play games that my friends are playing too and we try to beat each others scores and pass each other on different levels.</p>

### 4.3.3 Summary of key characteristics of smartphone gamers

As a result of the descriptive statistics a summary of the key distinguishing characteristics of smartphone gamers and their various segments is shown in Table 4.12.

**Table 4.12 Summary of smartphone gamer characteristics**

Summary & Key Characteristics of Smartphone Gamers	
Smartphone Gamers	Play a variety of game genres. Play to pass time or for distraction. Most play at home as well as while commuting or waiting. 50% play daily.
Male Gamers	Play more Sports & Racing Games. Play at work or university.
Female Gamers	Most frequent smartphone players. Prefer Brain & Puzzle Games. Play in the car.
Generation Y	More hardcore gamers. Varied game genre choices. Will play anywhere.
Generation X	Varied game genre choices.
Baby Boomers	Play more single player Games. Prefer simpler, slower games. Less likely to play in the public sphere.
Low Playfulness	Limited game genre choices.
Medium Playfulness	Enjoy games more than those of low playfulness.
High Playfulness	Varied game genre choices. More likely to play in public spheres. Enjoy smartphone games more.

These characteristics indicate that there are differences in age, gender and playfulness external to the conceptual model and provide support to the potential validity of the hypotheses concerning these variables.

#### **4.4 Exploratory Factor Analysis**

Exploratory factor analysis (EFA) was used as tool in this an analysis in order to provide operational definitions for descriptive statistics and subsequent structural equation modelling and also to test the validity and reliability of the proposed measurement instruments. The general purpose of factor analytic techniques is to define the underlying structure of the variables and the primary purpose of EFA is to define the underlying structure among the variables in the analysis (Hair et al. 2006). The Bartlett test of sphericity tests the null hypothesis that there are no correlations amongst the variables. If the observed significance is small ( $<.05$ ) then the test provides the evidence that the correlation matrix has significant correlations between at least some of the variables (Hair et al. 2006). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is used to compare the magnitude of the observed correlations in relation to the magnitudes of the partial correlation coefficients. Measures less than 0.5 are not suitable for

further analysis. All variables were examined using the varimax rotation method and KMO as “rotation of the factors improves the interpretation by reducing some of the ambiguities that often accompany initial unrotated factor solutions’ (Hair et al. 2006, p. 123). Varimax rotation was chosen as though it is usually the default, there is no compelling analytical reason to choose one method over another (Hair et al. 2006). While factor loadings in the range of .30 - .40 can be considered with a sample size over 350, loadings greater than 0.5 are considered to be practically significant (Hair et al. 2006) and are considered for further evaluation in this research.

#### 4.4.1 Independent Variables

Firstly the independent variables; The Need for Competence, The Need for Autonomy, The Need for Relatedness, Social Escapism, Flow and Competition were tested to dimensionality of the constructs. Inspection of the correlation matrix (Appendix 1.4) ensured that all items have at least one correlation greater than 0.5. The KMO was .898 and the Test of Sphericity is highly significant ( $p < .05$ ), see table 4.13.

**Table 4.13 KMO & Bartlett’s Independent Variables**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.898
Bartlett's Test of Sphericity	Approx. Chi-Square	6118.357
	Df	351
	Sig.	.000

Inspection of the correlation matrix ensured that all items, bar one, have at least one correlation greater than 0.5. The item ‘Because it takes me to another world’ (Social Escapism) has no correlation above 0.5 and crossloads above 0.4 and thus is eliminated from further analysis. Exploring the factors again with a further EFA resulted in the same six principle factors. Table 4.14 displays the relevant Eigenvalues of the Factors.

**Table 4.14 Eigenvalues of Factors**

Factors	Initial Eigenvalues	% of Variance
Factor 1	9.666	35.802
Factor 2	3.223	11.985
Factor 3	1.959	7.257
Factor 4	1.455	5.390
Factor 5	1.337	4.951
Factor 6	1.055	3.908

**Factor 1- The Need for Competence and Autonomy**

Factor One consisted of six items: I feel competent at games on my phone; I feel very capable and effective when playing games on my phone; My ability to play phone games is well matched with the games challenges; The games I play on my phone provide me with interesting options and choices; The games I play on my phone let me do interesting things; I experienced a lot of freedom in the games I play on my phone. This factor consisted exclusively for the Need for Competence and the Need for Autonomy (Ryan et al. 2006) and explained 37.152 percent of the variance, see table 4.15.

The Needs for Competence and Autonomy being realised as one factor can be seen as reflective of the research design. Previous research (Park & Kim 2013, Terlutter & Capella 2013) identified a major weakness of previous game studies in that results were usually game or genre specific which in turn made generalising to other contexts questionable. This research asked respondents to think about their general smartphone play rather than specific play experiences. The original studies (Ryan et al. 2006) while proposing these psychological constructs in the context of video games, initially examined only the role of competence and autonomy in the enjoyment of single player games. The need for relatedness was only tested in the fourth of the four initial studies which took into account other players in a multiplayer environment. Hypothesising that satisfaction of the needs for competence, autonomy and relatedness resulted in higher levels of

game enjoyment their ‘results largely supported our hypotheses concerning the relations between autonomy and competence satisfactions in solitary game play, and of all three needs in multi-player environments’ (Ryan et al. 2006, p. 361). Alternate studies utilising the PENS scales have adopted this approach of only examining the need for relatedness in explicitly multiplayer games while examining competence and autonomy for all game types (Tamborini et al. 2011, Przybylski, Ryan & Rigby 2009 and Peng et al. 2012). In this research, respondents were not asked to reflect on specific games or recent game experiences as in previous studies (Ryan et al. 2006, Johnson & Gardner 2010) but instead on the games that they play on their smartphone. Given that ‘games that elicited greater experiences of autonomy and competence resulted in more enjoyment’ (Ryan et al. 2006, p. 357), this research assumes that people play games that satisfy their needs for competence and autonomy (mean = 5.067).

**Table 4.15 The Need for Competence and Autonomy**

Items	
I feel competent at games on my phone.	.808
I feel very capable and effective when playing games on my phone.	.835
My ability to play phone games is well matched with the games challenges	.821
The games I play on my phone provide me with interesting options and choices	.724
The games I play on my phone let me do interesting things	.718
I experienced a lot of freedom in the games I play on my phone.	.717

## **Factor 2 Social Arousal**

Factor 2 consisted of six items: Because it stirs me up; Because it arouses my emotions and feelings; Because it makes me feel less lonely; Because it shows me how to get along with others; So I won’t be alone; I do not like to play games alone. This factor explained 11.966 percent of the total variance, refer to table 4.16. All six items were part of Korgaonkar and Wolin’s (1999) Social Escapism which was originally derived using multivariate factor analysis of a UGT approach. Their initial theorization of the construct was that of two separate constructs,

one being ‘gratifying in its ability to provide diversion, to arouse emotions and feelings, and to provide aesthetic enjoyment. Thus, we see the Web being used as a relaxant to relieve day-to-day boredom and stress’ (Korgaonkar & Wolin 1999, p. 56). The values which have high loadings on Factor 2 are primarily related to the social aspects and arousal aspects of the construct. Therefore this construct can subsequently be identified as Social Arousal.

**Table 4.16 Social Arousal**

Items	
Because it shows me how to get along with others	.789
So I won't be alone	.704
I do not like to play games alone	.702
Because it stirs me up	.684
Because it arouses my emotions and feelings	.682
Because it makes me feel less lonely	.594

### **Factor 3 – Competition**

Factor three consists of four items: When playing games on my smartphone;-I like to play to prove to my friends that I am the best; When playing games on my smartphone;-When I lose to someone, I immediately want to play again in an attempt to beat him/her; When playing games on my smartphone;-It is important to me to be the fastest and most skilled person playing the game; When playing games on my smartphone;-I get upset when I lose to my friends. These items form the variable competition as originally theorised by (Greenberg et al. 2010), see table 4.17.

**Table 4.17 Competition**

Items	
When playing games on my smartphone;-I like to play to prove to my friends that I am the best.	.743
When playing games on my smartphone;-When I lose to someone, I immediately want to play again in an attempt to beat him/her	.808
When playing games on my smartphone;-It is important to me to be the fastest and most skilled person playing the game	.752
When playing games on my smartphone;-I get upset when I lose to my friends	.791

**Factor 4 – Mobile Escapism**

Factor four consists of four items: So I can escape from reality; So I can get away from what I am doing; So I can forget about work/study; Because it helps me unwind. These items form the remainder of Social Escapism (Korgaonkar & Wolin 1999). These items are primarily related to the escapism aspects of the construct. Therefore this construct can subsequently be identified as escapism and given the context of smartphone gaming, named as ‘Mobile Escapism’, see table 4.18.

**Table 4.18 Mobile Escapism**

Items	
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

**Factor 5 – The experience of Flow**

Factor five is made up of three items: Do you think you have ever experienced flow in playing a game on your smartphone?; In general, how frequently would you say you have experienced “flow” when you play a smartphone game; Most of the time I play a smartphone game I feel that I am in flow. These items comprise the variable of the experience of Flow (table 4.19) and remain a single construct as originally theorized (Hsu & Lu 2004).



**Table 4.19 The experience of Flow**

Items	
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

### **Factor 6 – The Need for Relatedness**

Factor six consists of three items: I find the relationships with others in games on my phone fulfilling; I find the relationships with others in games on my phone important;

I don’t feel close to other players. Factor six (table 4.20) can be seen as the need for relatedness as originally theorized (Ryan et al. 2006).

**Table 4.20 The Need for Relatedness**

Items	
I find the relationships with others in games on my phone fulfilling.	.608
I find the relationships with others in games on my phone important.	.614
I don’t feel close to other players	.745

### **4.4.2 Summary of EFA**

The EFA resulted in six independent variables. The Need for Relatedness, the experience of Flow and Competition were retained in their original forms. The Need for Competence and the Need for Autonomy formed one construct: the Need for Competence and Autonomy. Social Escapism resulted in two separate constructs: Social Arousal and Mobile Escapism. As a result the conceptual model was revised to reflect the findings of the EFA. (Fig 4.4)

### 4.4.3 Playfulness

The young adult playfulness scales was examined separately from the constructs in the main model. This is due to the fact that this variable concerns aspects of the respondents themselves and is considered separate from the main conceptual model.

#### Playfulness

Inspection of the correlation matrix ensured that all items have at least one correlation greater than 0.5. The Test of Sphericity is highly significant ( $p < .05$ ), see table 4.21.

**Table 4.21 KMO & Bartlett's Playfulness**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.848
Bartlett's Test of Sphericity	Approx. Chi-Square	3734.813
	Df	105
	Sig.	.000

Factor one is **Dynamic Gregariousness** consisting of Cheerful, Happy, Friendly, Outgoing, Sociable, Active and Energetic. This factor can be seen to explain 43.140 percent of the total variance. This factor is a combination of the two original theorized factors of Dynamic and Gregarious. Factor two was **Comedic** which is made up of Clowns Around, Jokes/Teases, Humorous and Funny and which explains 16.601percent of the total variance. Factor three was **Uninhibited** which consists of Spontaneous, Impulsive, Unpredictable and Adventurous explaining 10.027 percent of the variance. Tables 4.22 and 4.23 illustrate this.

**Table 4.22 Rotated components matrix Playfulness**

Rotated Component Matrix <sup>a</sup>			
	Component		
	1	2	3
Clowns Around		.827	
Jokes/Teases		.853	
Humorous		.856	
Funny		.813	
Spontaneous			.794
Impulsive			.819
Unpredictable			.815
Adventurous			.620
Cheerful	.790		
Happy	.841		
Friendly	.774		
Outgoing	.759		
Sociable	.808		
Active	.721		
Energetic	.771		

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 5 iterations.

**Table 4.23 Eigenvalues of Playfulness**

Factor	Initial Eigenvalues	% of Variance
Factor 1	6.511	43.140
Factor 2	2.520	16.601
Factor 3	1.542	10.027

#### 4.4.4 Dependent Variable

##### Enjoyment

The enjoyment variable, adapted from the Intrinsic Motivation Inventory (Ryan, Mims, & Koestner 1983) was found to be suitable for use as a dependent variable.

Inspection of the correlation matrix ensured that all items have at least one correlation greater than 0.5. The Test of Sphericity is highly significant ( $p < .05$ ) while the KMO of .667 which indicates that enjoyment is suitable for use as a dependent variable, see tables 4.24 and 4.25 for details.

**Table 4.24 KMO & Bartlett Enjoyment**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.667
Bartlett's Test of Sphericity	Approx. Chi-Square	522.904
	Df	3
	Sig.	.000

**Table 4.25 Enjoyment**

Items	
I enjoy playing games on my phone.	.832
Playing games on my phone is fun to do	.831
Playing games on my phone is boring	.591

#### 4.4.5 Reliability of Scales

Cronbach's Alpha was used to test the reliability of the proposed scales. Cronbach's Alpha is a coefficient of internal consistency. It is used as an estimate of the reliability of constructs. The alpha coefficient for any set of items should generally be over .70 to be deemed as an acceptable construct (Hair et al. 2006). Table 4.26 demonstrates the reliability of the ensuing constructs.

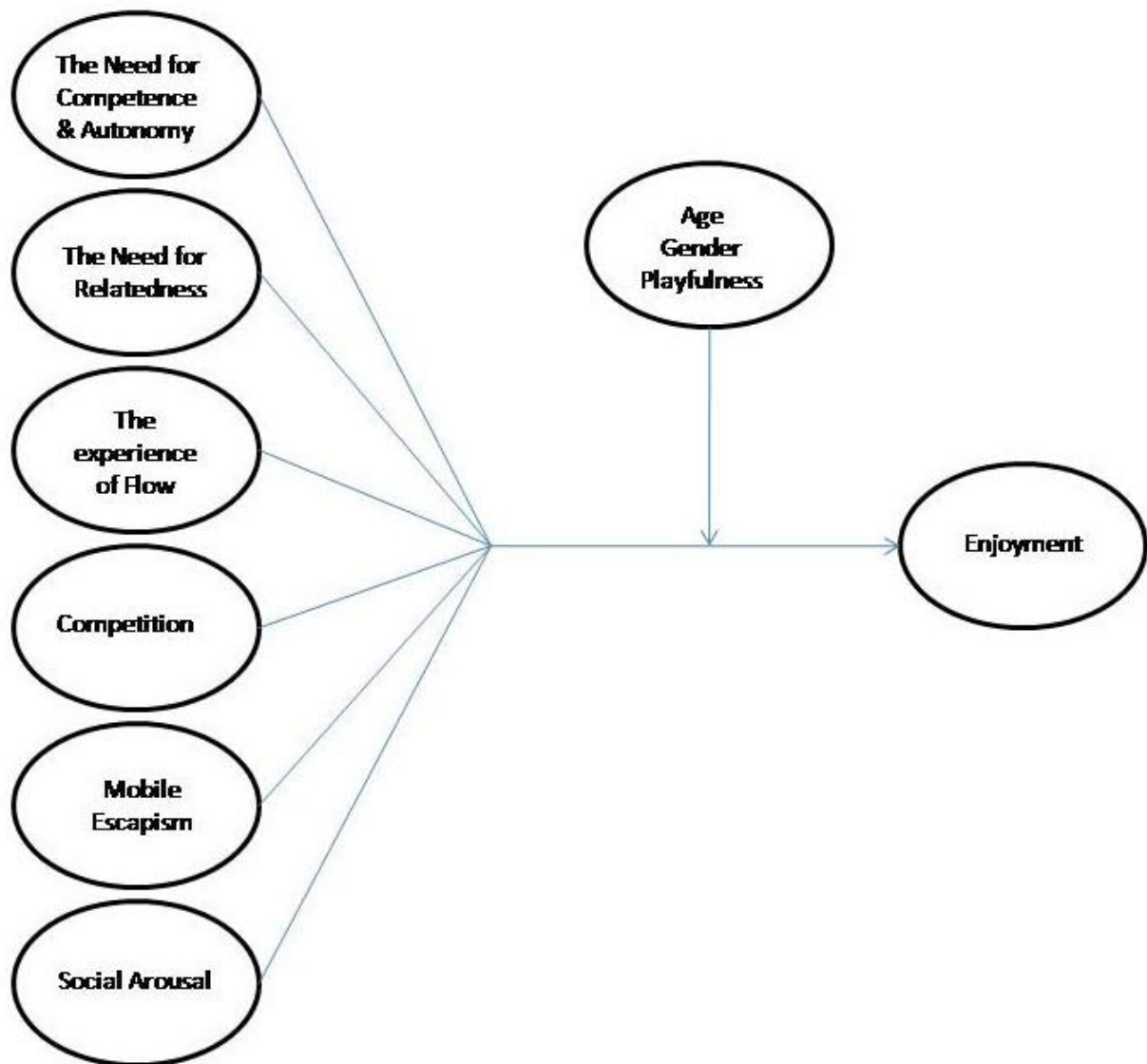
**Table 4.26 Construct Reliability**

Scale	Cronbach's Alpha
The Need for Competence& Autonomy	.897
The Need for Relatedness	.698
The experience of Flow	.951
Competition	.881
Social Arousal	.865
Mobile Escapism	.745
Playfulness	.901
Enjoyment	.814

The exploratory factor analysis resulted in changes being made to the original conceptual model.

See Fig 4.2.

Fig 4.2 Revised conceptual model



#### 4.5 Confirmatory Factor Analysis

CFA was performed using AMOS 20.0.0 to assess the factor structure of both the independent variables and the playfulness variable in separate analysis's in order to establish model fit in terms of the revised conceptual model. Results of the CFA were examined using the following goodness of fit criteria established in Chapter three.

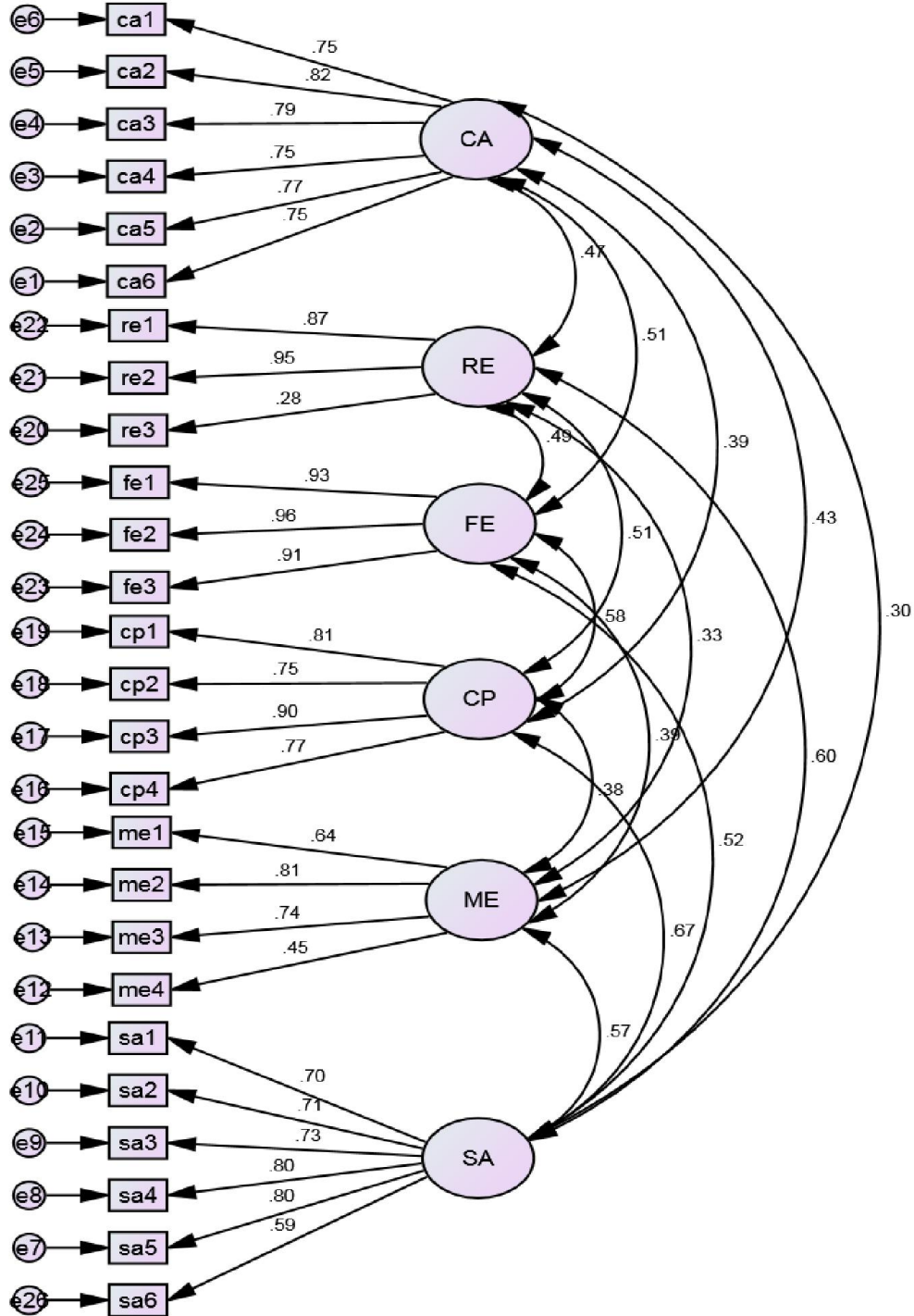
### 4.5.1 Independent Variables

Confirmatory factor analyses (CFA) was performed to assess the factor structure of the latent constructs Competence & Autonomy, The Need for Relatedness, Mobile Escapism, Competition, the experience of Flow and Social Arousal. One of the assumptions of CFA is that variables are measured at the continuous level. There were twenty six items that measured the constructs. Initial results are shown in table 4.27 and fig 4.3.

**Table 4.27 Initial Goodness of Fit results**

Model Fit Independent Variables	Model Comparison
Chi-squared 968.929	Tucker-Lewis Index (TLI) .863
Degrees of Freedom 284	Normed Fit Index (NFI) .840
P-value .000	Comparative Fit Index .881
Cmin/df 3.412	
Goodness of fit index .799	
Adjusted Goodness-of-Fit .752	
RMSEA .165	

Fig 4.3 Initial CFA of Independent variables





Initial analysis of the model did not result in an acceptable model fit. Accordingly, examination of the modification indices resulted in co-varying of error terms that were part of the same factor. Items e3 (ca4) and e2 (ca5), e6 (ca1) and e1 (ca6), e7 (sa5) and e9 (sa3), e10 (sa2) and e11 (sa1) were co-varied resulting in an acceptable overall model fit. Item e20 (re3) ‘I don’t feel close to other players’ was removed from the model to further improve model fit. Subsequently there was an improvement in the overall model fit. Table 4.28 illustrates the final CFA outcomes and model fit.

**Table 4.28 Final CFA Goodness of Fit results Independent Variables**

Model Fit Independent Variables	Model Comparison
Chi-squared 652.216	Tucker-Lewis Index (TLI) .919
Degrees of Freedom 325	Normed Fit Index (NFI) .891
P-value .000	Comparative Fit Index .930
Cmin/df 2.548	
Goodness of fit index .865	
Adjusted Goodness-of-Fit .828	
RMSEA .068	

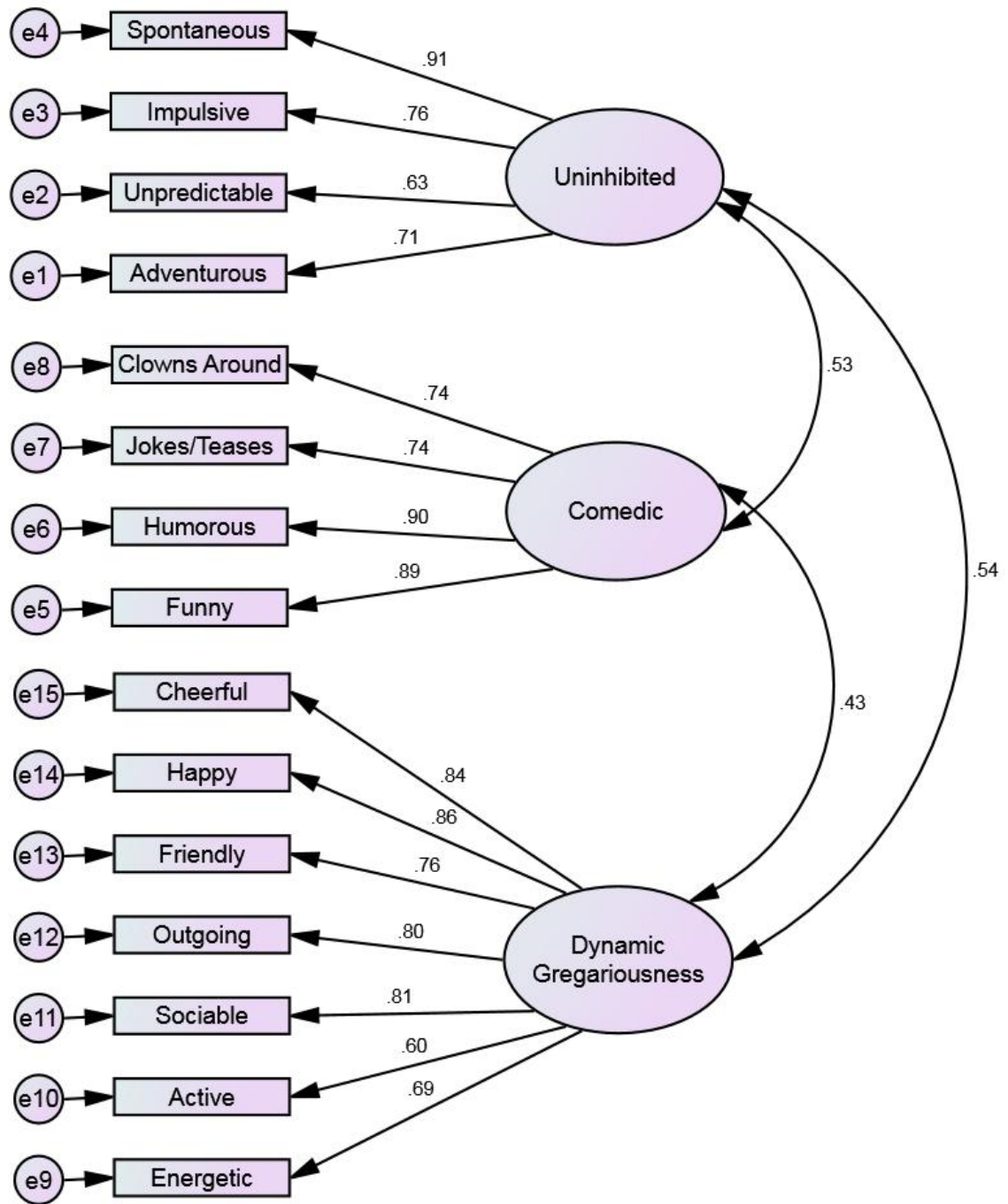
### 4.5.2 Playfulness

Confirmatory factor analyses (CFA) was performed to assess the factor structure of the latent constructs Uninhibited, Comedic and Dynamic Gregariousness which overall make up the playfulness construct. There were fifteen items that measured the constructs. Initial results are shown in table 4.29 and fig 4.4.

**Table 4.29 Initial Model Fit Playfulness**

Model Fit Playfulness	Model Comparison
Chi-squared 887.645	Tucker-Lewis Index (TLI) .738
Degrees of Freedom 87	Normed Fit Index (NFI) .766
P-value .000	Comparative Fit Index .783
Cmin/df 10.203	
Goodness of fit index .752	
Adjusted Goodness-of-Fit .658	
RMSEA .165	

**Fig 4.4 Initial CFA of Playfulness**



Initial analysis of the model did not result in an acceptable model fit. Accordingly, examination of the modification indices resulted in co-varying of error terms that were part of the same factor.

Items e9 (Energetic) and e10 (Active), e14 (Happy) and e15 (Cheerful), e7 (Jokes/Teases) and e8 (Clowns Around) were co-varied resulting in an acceptable overall model fit as shown in table 4.30.

**Table 4.30 Final CFA Goodness of Fit results Playfulness**

Model Fit Independent Variables	Model Comparison
Chi-squared 297.286	Tucker-Lewis Index (TLI) .928
Degrees of Freedom 84	Normed Fit Index (NFI) .922
P-value .000	Comparative Fit Index .942
Cmin/df 3.539	
Goodness of fit index .894	
Adjusted Goodness-of-Fit .848	
RMSEA .087	

### 4.5.3 Construct Validity

Construct Validity ‘is the extent to which a set of measured items actually reflects the theoretical latent construct those items are designed to measure’ (Hair et al. 2006, p. 776). When the proposed CFA model fits and displays construct validity then the measurement theory is supported. To assess construct validity it is recommended to examine content, convergent and discriminant validity.

### 4.5.4 Content Validity

Content Validity is the relatively subjective assessment of how closely the variables match their theoretical and conceptual definitions (Hair et al. 2006) and this has been previously established in this thesis.

### 4.5.5 Convergent Validity

Convergent Validity is where the items that are indicators of specific constructs converge or share a high proportion of variance in common (Hair et al. 2006). Factor loadings greater than 0.5, and ideally greater than 0.7, demonstrate convergent validity. Further indication of convergent validity can be shown through the average variance extracted. Reliability as through the calculation of construct reliability is also a good indicator of convergent validity and can be seen in table 4.31.

**Table 4.31 Construct Reliability**

	Construct Reliability	Average Variance Extracted
Social Arousal	0.845	0.577
Competence & Autonomy	0.872	0.582
Relatedness	0.906	0.827
Mobile Escapism	0.774	0.535
Competition	0.882	0.653
Flow	0.952	0.868
Uninhibited	0.843	0.577
Comedic	0.876	0.706
Dynamic Gregariousness	0.858	0.561

**Fig 4.5 Construct Reliability & Average Variance Equations**

$$CR = \frac{(\sum \lambda)^2}{[(\sum \lambda)^2 + \sum (1 - \lambda^2)]}$$

$$AVE = \frac{\sum \lambda^2}{[\sum \lambda^2 + \sum (1 - \lambda^2)]}$$

Source: Hair et al. (2006).

Average Variance extracted should be higher than 0.5 and Construct Reliability should be higher than 0.7 (Hair et al. 2006). As demonstrated in table 4.33 all factors demonstrate acceptable construct reliability and average variance extracted demonstrating convergent validity.

### 4.5.6 Discriminant Validity

Discriminant Validity is the extent to which a construct is truly distinct from other constructs (Hair et al. 2006). It provides evidence that a construct is unique and captures something that the other constructs do not. This measure can be supported if the estimated correlations between the factors are not excessively high. Highly correlated indicators for particular constructs may imply a definitional overlap between constructs.

Zait and Berteau (2011) proposed utilising AVE (Average Variance Extracted) as a test of discriminant validity which is calculated as per Fig 4.13, where  $\lambda_i$  is the loading of each measurement item on its corresponding construct and  $\epsilon_i$  is the error measurement. Subsequently it should be tested to see if the square root of every AVE value belonging to each latent construct is larger than any correlation among any pair of latent constructs. As per Zait and Berteau (2011) a matrix was created to examine the correlation of each construct with the other constructs. On the diagonal the AVE value was inserted in order to compare it with the other correlation coefficient, see tables 4.32 and 4.33.

The results of the above analysis demonstrate that there is discriminant validity between the constructs.

**Fig 4.6 Average Variance Extracted Equation**

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$$AVE = \frac{\Sigma[\lambda_i^2]}{\Sigma[\lambda_i^2] + \Sigma[\text{Var}(\epsilon_i)]}$$

---

**Table 4.32 Discriminant Validity of the Independent Variables**

	Social Arousal	Competence & Autonomy	Relatedness	Mobile Escapism	Competition	Flow
Social Arousal	0.577					
Competence & Autonomy	0.451	0.582				
Relatedness	0.567	0.559	0.827			
Mobile Escapism	0.584	0.441	0.336	0.535		
Competition	0.662	0.421	0.516	0.390	0.653	
Flow	0.557	0.523	0.488	0.391	0.580	0.868

**Table 4.33 Discriminant Validity of Playfulness**

	Uninhibited	Comedic	Dynamic Gregariousness
Uninhibited	0.577		
Comedic	0.523	0.706	
Dynamic Gregariousness	0.451	0.416	0.561

#### 4.5.7 Confirmatory Factor Analysis Summary

Based on preceding theoretical arguments Confirmatory Factor Analysis was applied to the proposed conceptual model. The results of the CFA confirmed the factor structure of the proposed variables for the examination of the conceptual model. One item was removed from the constructs identified in the EFA. Construct validity was assessed and supported through an examination of content, convergent and discriminant validity. Accordingly, the model was deemed ready for testing of the proposed hypotheses and as a result the hypotheses were reformulated to take the new conceptual model into consideration.

#### 4.6 Reformulated Hypotheses

Hypothesis 1: The Need for Competence& Autonomy positively influences the enjoyment of smartphone games.

Hypothesis 2: The Need for Relatedness positively influences the enjoyment of smartphone games.

Hypothesis 3: The experience of Flow positively influences the enjoyment of smartphone games.

Hypothesis 4: Competition positively influences the enjoyment of smartphone games.

Hypothesis 5: Social Arousal positively influences the enjoyment of smartphone games.

Hypothesis 6: Mobile Escapism positively influences the enjoyment of smartphone games.

Hypothesis 7: Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 8: Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 9: Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

## **4.7 Regression Analysis**

Correlation and multiple linear regression analysis were conducted to examine the relationship between the construct of enjoyment and the theorised predictors. Hierarchical regressions were utilised to test for interaction effects involving the three potential moderators of gender, age and playfulness. Correlations were computed among ten constructs on data for 340 respondents.

### **4.7.1 The Main Model**

The Need for Competence & 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 ANOVA demonstrated that the model as a whole is a significant fit to



the data. An examination of the correlations table demonstrates that there are no highly significant correlations between the independent variables, moderators and dependent variable indicating there are no multicollinearity issues with the model. The prediction model was statistically significant,  $F(9, 339) = 22.777, p < .001$ , and accounted for approximately 37% of the variance of enjoyment ( $R^2 = .383$ , Adjusted  $R^2 = .366$ ). Table 4.34 summarises the correlations for the regression analysis.

**Table 4.34 Correlations**

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

\* $p < .05$

### Summary of Results

Hypothesis 1 predicted that the Need for Competence & Autonomy positively influences enjoyment. The results of the regression (see table 4.35) show that the hypothesis is supported, since the coefficient of Competence & Autonomy is positive (.475) and is significant at the .05 level ( $p = .000$ ).

Hypothesis 2 predicted that the Need for Relatedness positively influences enjoyment. The results of the regression show that the hypothesis is supported, since the coefficient of Relatedness is positive (.097) and is significant at the .05 level ( $p = .015$ ). In order to test the

model further, the same regression was run with the data split into those who play only single player and those who play some form of multiplayer. The main difference between the two samples was that for multi players the Need for Relatedness had a positive influence on enjoyment ( $\beta = 0.106$ ,  $t_{(212)} = 2.477$ ,  $p < 0.05$ ) while it was not significant for single players ( $\beta = 0.099$ ,  $t_{(114)} = 1.562$ ,  $p > 0.05$ ). This reinforces that the Need for Relatedness is suitable for examining multiplayer games but is not applicable for single player games in its current form.

Hypothesis 3 predicted that the experience of Flow positively influences enjoyment. The results of the regression show that the hypothesis is supported, since the coefficient of Flow is positive (.097) and is significant at the .05 level ( $p = .003$ ).

Hypothesis 4 predicted that Competition positively influences enjoyment. The results of the regression show that the hypothesis is not supported, since the coefficient of Competition is negative (-.019) and is not significant at the .05 level ( $p = .627$ ).

Hypothesis 5 predicted that Mobile Escapism positively influences enjoyment. The results of the regression show that the hypothesis is supported, since the coefficient of Mobile Escapism is positive (.150) and is significant at the .05 level ( $p = .001$ ).

Hypothesis 6 predicted that the Social Arousal positively influences enjoyment. The results of the regression show that the hypothesis is not supported, since the coefficient of Social Arousal is negative (-.240) although it is significant at the .05 level ( $p = .000$ ). Social Arousal remains a construct with no clear theoretical basis. It has a negative influence on enjoyment and is not examined further due to a lack of conceptual clarity surrounding the construct.

Table 4.35 summarises the results of the analysis.

**Table 4.35 Multiple Regression Results**

The Need for Competence & Autonomy	( $\beta = 0.475$ , $t(330) = 6.592$ , $p < 0.05$ )
The Need for Relatedness	( $\beta = 0.097$ , $t(330) = 2.441$ , $p < 0.05$ )
The Experience of Flow	( $\beta = 0.097$ , $t(330) = 3.034$ , $p < 0.05$ )
Competition	( $\beta = -0.019$ , $t(330) = -0.486$ , $p > 0.05$ )
Mobile Escapism	( $\beta = 0.150$ , $t(330) = 3.412$ , $p < 0.05$ )
Social Arousal	( $\beta = -0.240$ , $t(330) = -4.720$ , $p < 0.05$ )
Gender	( $\beta = 0.142$ , $t(330) = 1.775$ , $p > 0.05$ )
Age	( $\beta = 0.007$ , $t(330) = -4.720$ , $p < 0.05$ )
Playfulness	( $\beta = -0.280$ , $t(330) = -4.720$ , $p > 0.05$ )

The results of the analysis supported four of the six initial hypotheses, see table 4.36. The Need for Competence & Autonomy, The Need for Relatedness, the Experience of Flow and Mobile Escapism positively influenced the enjoyment of smartphone games, confirming hypotheses one, two, three and six. Competition was not a significant predictor of enjoyment while Social Arousal negatively impacted enjoyment resulting in hypotheses four and five not being supported. The Need for Competence & Autonomy was the strongest predictor of enjoyment.

The results of the analysis are discussed in detail in Chapter 5.

**Table 4.36 Initial Hypothesis Results**

Hypothesis	Result
Hypothesis 1: The Need for Competence & Autonomy positively influences the enjoyment of smartphone games.	Supported
Hypothesis 2: The Need for Relatedness positively influences the enjoyment of smartphone games.	Supported
Hypothesis 3: The experience of Flow positively influences the enjoyment of smartphone games.	Supported
Hypothesis 4: Competition positively influences the enjoyment of smartphone games.	Not Supported
Hypothesis 5: Social Arousal positively influences the enjoyment of smartphone games.	Not Supported
Hypothesis 6: Mobile Escapism positively influences the enjoyment of smartphone games.	Supported

## 4.7.2 Player Characteristics

Three hypotheses remained to be tested.

Hypothesis 7: Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 8: Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

Hypothesis 9: Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.

## 4.7.3 Gender

To test the hypothesis that gender moderates the relationship between the intrinsic motivations of the Need for Competence & Autonomy, the Need for Relatedness, the experience of Flow, Mobile Escapism and the dependant variable of Enjoyment, a hierarchical multiple regression was run. In the first step the requisite intrinsic motivation, the dummy coded variable of gender (in this case male = 0, female = 1) and the dependant variable of Enjoyment were added. In the second step the interaction term was added and the regression re-run. The interaction term was created through centering the intrinsic motivation and multiplying by the moderating variable.

To test whether gender moderates the relationship between the Need for Competence and Autonomy and Enjoyment, firstly a regression was run with The Need for Competence and Autonomy and Gender as the independent variables and Enjoyment as the dependent variable,  $R^2 = .306$ ,  $F(2, 337) = 74.382$ ,  $p < .001$ . These variables accounted for a significant amount of variance in enjoyment. However when the interaction term was added to the hierarchical regression in the

second step, the model was not significant,  $\Delta R_2 = .002$ ,  $\Delta F(1, 336) = .771$ ,  $p > .001$ ,  $b = -.075$ ,  $t(336) = -.878$ ,  $p > .01$ . Therefore gender does not moderate the relationship between the Need for Competence and Autonomy and Enjoyment.

To test whether gender moderates the relationship between the Need for Relatedness and Enjoyment, firstly a regression was run with The Need for Relatedness and Gender as the independent variables and Enjoyment as the dependent variable,  $R_2 = .078$ ,  $F(2, 337) = 14.287$ ,  $p < .001$ . These variables accounted for some variance in enjoyment. Next the interaction term was added to the hierarchical regression and the model was not significant,  $\Delta R_2 = .003$ ,  $\Delta F(1, 336) = 9.908$ ,  $p < .001$ ,  $b = .062$ ,  $t(336) = 1.067$ ,  $p > .01$ . An examination of the interaction plot indicated that for females satisfaction of the Need for Relatedness is more closely correlated with Enjoyment than for males. Gender does not moderate the relationship between the Need for Relatedness and Enjoyment.

To test whether gender moderates the relationship between the experience of Flow and Enjoyment, firstly a regression was run with the experience of Flow and Gender as the dependent variables and Enjoyment as the Dependent Variable,  $R_2 = .108$ ,  $F(2, 337) = 20.498$ ,  $p < .001$ . These variables accounted for variance in enjoyment. When the interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R_2 = .000$ ,  $\Delta F(3, 336) = .110$ ,  $p < .001$ ,  $b = -.019$ ,  $t(336) = -.331$ ,  $p > .01$ . Gender does not moderate the relationship between the experience of Flow and Enjoyment.

Finally, to test whether gender moderates the relationship between the Mobile Escapism and Enjoyment, firstly a regression was run with Mobile Escapism and Gender as the independent variables and Enjoyment as the dependent variable,  $R_2 = .087$ ,  $F(2, 337) = 16.093$ ,  $p < .001$ . These variables accounted for variance in enjoyment and the model was significant. When the

interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R_2 = .005$ ,  $\Delta F(1, 336) = 1.791$ ,  $p < .001$ ,  $b = -.115$ ,  $t(336) = -1.338$ ,  $p > .01$ . Therefore gender does not moderate the relationship between Mobile Escapism and Enjoyment.

Given that Gender does not moderate the relationships between any of the identified intrinsic motivations and the dependent variable of Enjoyment, it can be seen that Gender does not moderate the relationship between the intrinsic motivations and enjoyment of smartphone play.

Hypothesis 7: Gender moderates the intrinsic motivations that drive the enjoyment of the smartphone play experience: **Not Supported**

#### **4.7.4 Age**

To test the hypothesis that Age moderates the relationship between the intrinsic motivations of the Need for Competence & Autonomy, the Need for Relatedness, the experience of Flow, Mobile Escapism and the dependant variable of Enjoyment, a hierarchical multiple regression was run. In the first step the requisite intrinsic motivation, age and the dependant variable of Enjoyment were added. In the second step the interaction term was added and the regression re-run. The interaction term was created through centering the intrinsic motivation and multiplying by the moderating variable.

To test whether Age moderates the relationship between the Need for Competence and Autonomy and Enjoyment, firstly a regression was run with The Need for Competence and Autonomy and Age as the independent variables and Enjoyment as the dependent variable,  $R_2 = .304$ ,  $F(2, 337) = 73.485$ ,  $p < .001$ . These variables accounted for a significant amount of variance in enjoyment. When the interaction term was added to the hierarchical regression in the second step, the model was also significant,  $\Delta R_2 = .001$ ,  $\Delta F(1, 336) = 0.338$ ,  $p < .001$ ,  $b = -.002$ ,  $t(336) = -.623$ ,  $p >$

.01. Therefore Age does not moderate the relationship between the Need for Competence and Autonomy and Enjoyment.

To test whether Age moderates the relationship between the Need for Relatedness and Enjoyment firstly a regression was run with The Need for Relatedness and age as the independent variables and Enjoyment as the dependent variable,  $R_2 = .073$ ,  $F(2, 337) = 13.363$ ,  $p < .001$ . These variables accounted for some variance in enjoyment. Next the interaction term was added to the hierarchical regression and the model was not significant,  $\Delta R_2 = .004$ ,  $\Delta F(1, 336) = 1.551$ ,  $p < .001$ ,  $b = .003$ ,  $t(336) = 1.245$ ,  $p > .01$ . Age does not moderate the relationship between the Need for Relatedness and Enjoyment.

To test whether Age moderates the relationship between the experience of Flow and Enjoyment, firstly a regression was run with the experience of Flow and Age as the independent variables and Enjoyment as the dependent variable,  $R_2 = .100$ ,  $F(2, 337) = 18.815$ ,  $p < .001$ . These variables accounted for variance in enjoyment. When the interaction term was added to the hierarchical regression in the second step, the model was not significant and there was change in the  $R_2$  value,  $\Delta R_2 = .005$ ,  $\Delta F(1, 336) = 2.001$ ,  $p < .001$ ,  $b = -.003$ ,  $t(336) = -1.414$ ,  $p > .01$ . Age does not moderate the relationship between the experience of Flow and Enjoyment.

To test whether Age moderates the relationship between the Mobile Escapism and Enjoyment, firstly a regression was run with Mobile Escapism and Age as the independent variables and Enjoyment as the dependent variable,  $R_2 = .083$ ,  $F(2, 337) = 15.239$ ,  $p < .001$ . These variables accounted for variance in enjoyment and the model was significant. When the interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R_2 =$

.009,  $\Delta F(1, 336) = 3.173$ ,  $p < .001$ ,  $b = -.005$ ,  $t(336) = -1.781$ ,  $p > .01$ . Age does not moderate the relationship between Mobile Escapism and Enjoyment.

Given that Age does not moderate the relationships between any of the identified intrinsic motivations and the dependent variable of Enjoyment, it can be seen that Age does not moderate the relationship between the intrinsic motivations and enjoyment of smartphone play.

Hypothesis 8: Age moderates the intrinsic motivations that drive the enjoyment of the smartphone play experience: **Not Supported**

#### **4.7.5 Playfulness**

To test the hypothesis that Playfulness moderates the relationship between the intrinsic motivations of the Need for Competence & Autonomy, the Need for Relatedness, the experience of Flow, Mobile Escapism and the dependant variable of Enjoyment, a hierarchical multiple regression was run. In the first step the requisite intrinsic motivation, playfulness and the dependant variable of Enjoyment were added. In the second step the interaction term was added and the regression re-run. The interaction term was created through centering the intrinsic motivation and multiplying by the moderating variable.

To test whether Playfulness moderates the relationship between the Need for Competence and Autonomy and Enjoyment, firstly a regression was run with The Need for Competence and Autonomy and Playfulness as the independent variables and Enjoyment as the dependent variable,  $R^2 = .296$ ,  $F(2, 337) = 70.917$ ,  $p < .001$ . These variables accounted for a significant amount of variance in enjoyment. When the interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R^2 = .001$ ,  $\Delta F(1, 336) = .449$ ,  $p < .001$ ,  $b = .022$ ,  $t(336) = .670$ ,



$p > .01$ . Therefore Playfulness does not moderate the relationship between the Need for Competence and Autonomy and Enjoyment.

To test whether Playfulness moderates the relationship between the Need for Relatedness and Enjoyment, firstly a regression was run with The Need for Relatedness and playfulness as the independent variables and Enjoyment as the dependent variable,  $R_2 = .085$ ,  $F(2, 337) = 15.741$ ,  $p < .001$ . These variables accounted for some variance in enjoyment. Next the interaction term was added to the hierarchical regression and the model was not significant,  $\Delta R_2 = .000$ ,  $\Delta F(1, 336) = .111$ ,  $p < .001$ ,  $b = .009$ ,  $t(336) = .333$ ,  $p > .01$ . Playfulness does not moderate the relationship between the Need for Relatedness and Enjoyment.

To test whether Playfulness moderates the relationship between the experience of Flow and Enjoyment, firstly a regression was run with the experience of Flow and Age as the independent variables and Enjoyment as the dependent variable,  $R_2 = .107$ ,  $F(2, 337) = 20.233$ ,  $p < .001$ . These variables accounted for variance in enjoyment. When the interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R_2 = .003$ ,  $\Delta F(1, 336) = 1.212$ ,  $p < .001$ ,  $b = .025$ ,  $t(336) = 1.101$ ,  $p > .01$ . Playfulness does not moderate the relationship between the experience of Flow and Enjoyment.

To test whether Playfulness moderates the relationship between the Mobile Escapism and Enjoyment, firstly a regression was run with Mobile Escapism and Playfulness as the independent variables and Enjoyment as the dependent variable,  $R_2 = .095$ ,  $F(2, 337) = 17.732$ ,  $p < .001$ . These variables accounted for variance in enjoyment and the model was significant. When

the interaction term was added to the hierarchical regression in the second step, the model was not significant,  $\Delta R^2 = .006$ ,  $\Delta F(1, 336) = 2.227$ ,  $p < .001$ ,  $b = .047$ ,  $t(336) = 1.492$ ,  $p > .01$ . Playfulness does not moderate the relationship between Mobile Escapism and Enjoyment.

Given that Playfulness does not moderate the relationships between any of the identified intrinsic motivations and the dependent variable of Enjoyment, it can be seen that Playfulness does not moderate the relationship between the intrinsic motivations and enjoyment of smartphone play.

Hypothesis 9: Playfulness moderates the intrinsic motivations that drive the enjoyment of the smartphone play experience. **Not Supported**

## 4.8 Hypothesis Testing Results

Table 4.38 shows the overall results for the hypothesis examined in this thesis while table 4.39 summarizes the smartphone gamer. The implications of these results are discussed in Chapter Five.

**Table 4.38 Final Hypothesis Testing Results**

Hypothesis	Result
Hypothesis 1: The Need for Competence & Autonomy positively influences the enjoyment of smartphone games.	Supported
Hypothesis 2: The Need for Relatedness positively influences the enjoyment of smartphone games.	Supported
Hypothesis 3: The experience of Flow positively influences the enjoyment of smartphone games.	Supported
Hypothesis 4: Competition positively influences the enjoyment of smartphone games.	Not Supported
Hypothesis 5: Social Arousal positively influences the enjoyment of smartphone games.	Not Supported
Hypothesis 6: Mobile Escapism positively influences the enjoyment of smartphone games.	Supported
Hypothesis 7: Gender moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.	Not Supported
Hypothesis 8: Age moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.	Not Supported
Hypothesis 9: Playfulness moderates the relationship between the intrinsic motivations and enjoyment of the smartphone play experience.	Not Supported

**Table 4.39 Summary of smartphone gamer characteristics**

Group	Characterstics
Smartphone Gamers	Play a variety of game genres. Play to pass time or for distraction. Most play at home as well as while commuting or waiting. 50% play daily. The Need for Competence & Autonomy is the primary drivers of enjoyment for all segments.
Male Gamers	Play more Sports & Racing Games. Play at work or university. Mobile.
Female Gamers	Most frequent smartphone players. Prefer Brain & Puzzle Games. Play in the car.
Generation Y	More hardcore gamers. Play all game genres. Will play anywhere.
Generation X	Play all game genres.
Baby Boomers	Play more single player games. Prefer simpler, slower games. Less likely to play in the public sphere.
Low Playfulness	Limited game genre choices.
Medium Playfulness	Enjoy games more than those of low playfulness.
High Playfulness	Varied game genre choices. More likely to play in public spheres. Enjoy games more.

## **Chapter 5**

### **SUMMARY & CONCLUSIONS**

#### **5.1 Summary of Findings**

This thesis adds to the knowledge path of intrinsic motivation through the development of a conceptual model that has relevance in understanding the context of the enjoyment of smartphone games. The concept of play is encapsulated as a series of key intrinsic motivations; which, when satisfied will result in longer lasting impacts on various behaviours and outcomes. The PENS scales and other constructs were successfully generalized and applied in the context of mobile gaming.

As a result, it can be seen that the Need for Competence & Autonomy, the Need for Relatedness, the experience of Flow and Mobile Escapism are the primary drivers of enjoyment and subsequent play of smartphone games. The Need for Competence & Autonomy is the strongest intrinsic motivation that allows for enjoyment of games and all players choose to play games that allow satisfaction of these needs. As a result satisfaction of these needs remains the most important consideration when implementing any game design.

Ryan et al. (2006) identified positive short-term shifts in player well-being when their gaming experiences provided satisfaction for the universal needs for competence, autonomy and relatedness. Conversely, games exerted a negative influence if it resulted in undermining of the satisfaction of these needs.

One of the key aspects of mobile and smartphone gaming is that through being ever present and accessible, it can provide satisfaction of these needs when needed. This is why people play games that allow them to satisfy these needs. This research examined people's experiences of the games that they actually played and it can be seen that respondents are choosing to play games

that allow them to experience competence, autonomy, and relatedness to others. Those who experience high levels of need satisfaction have more harmonious passion for play that results in more game enjoyment and a positive post play mood (Przybylski et al. 2010). This research supports previous research concerning need satisfaction and video games but situates it in the mobile context through the examination of smartphone gaming. It also provides empirical evidence that people choose games that support these needs, as opposed to previous research that tested the impact of particular games upon these needs.

The feedback afforded by games to players allows them to feel competent about their actions. This can result in players feeling better about their abilities and general competence. Similarly when a game allows a player to be autonomous in their actions this can potentially negate any perceived lack of autonomy within the context of their lives. When a game allows players to connect with others then their need to relate to other can be satisfied. Smartphone games can provide these satisfactions as and when a player perceives them as necessary for short term well being outcomes.

The experience of Flow is a positive experience where players engage with an activity with total involvement, enjoyment, control, concentration and intrinsic interest. Many players choose and play games in order to actively engage in an activity that will induce the experience of Flow. Smartphone games also provide a means of escapism from the realities of life when necessary. The impact of Mobile Escapism on enjoyment demonstrates that smartphone games are utilized to allow players to briefly get away from it all and further improve their mood or well being. That Competition did impact on enjoyment re-enforces that smartphone games are used to induce positive outcomes as competition may result in losing, and thus potentially negate positive outcomes.

Players generally know what to expect when they choose to play a game, as the strength of their motivation to begin a gaming session depends on personal evaluations of what they expect to occur during game play (Klimmt & Hartmann 2006). Thus smartphone players have immediate access to games when required and are intrinsically motivated to play as a result of being experienced in how the outcomes of gaming will make them feel.

This thesis has demonstrated that the characteristics of age, gender and playfulness have no significant influence on the intrinsic motivations that drive enjoyment in the conceptual model. Some limited differences were identified externally to the model. Males and females are attracted to different games in that males are more likely to play sports and racing games while females are more attracted to brain and puzzle games. Females are the most frequent players of smartphone games. In terms of age, the older Baby Boomers reflect archetypical assumptions about age and technology in that they mostly play simpler single player games. More playful people enjoy smartphone games more than those of lower playfulness.

Smartphone gaming can be further understood in terms of being a complex phenomenon that is facilitated through game choices and contextual events. Furthermore mobile gaming is no longer simply a device for filling in time while waiting or commuting but has now become a part of home life. Smartphone and mobile games have allowed an extension of the 'lucid' culture in that it has normalized gaming for a broader audience and as such we are beyond studies such as by Griffiths, Davis and Chappell (2004) that struggled to identify any meaningful demographic differences due to the previous prevalence of males under thirty as the truly dominant gamer population and source of data.

The most important outcome of these findings is that the concept of Play itself can now be conceptualised as a series of key intrinsic motivations that drive enjoyment. Satisfaction of the

Needs for Competence, Autonomy and Relatedness plus the experiencing of Flow and Escapism can be seen as conceptual underpinnings of enjoyment and subsequent play. These drivers of enjoyment can be seen as universal to all in terms of play, with gender, age and playfulness moderating their influence on enjoyment. As a result of these experiences it can be suggested, in line with Przybylski et al. (2010), that players experience short term boosts in their psychological well being, and as a result, when this happens with a certain game, continue to play the game in order to extend these positive outcomes of self.

That need satisfaction can be gained at any time through the presence of a ubiquitous context is what adds to the conceptual contribution of this thesis. Play has never before been accessible on demand as required for the satisfactions of the intrinsic motivations identified through this research. Previous research has identified traditional play such as through sport or chess as a situated activity (Huizanga, 1938) or even video gaming as one requiring a situated set of required items such as gaming consoles, personal computers and televisions (Ermi & Mäyrä 2005, Ryan et al. 2006). The smartphone context represents a shift in human behavior towards play previously unseen.

These results and their implications are discussed in full in the following sections.

## **5.2 The motivations towards enjoyment**

This section offers a more in depth understanding of the drivers of enjoyment of smartphone gaming and each relevant construct is discussed in greater detail.

### **5.2.1 The Need for Competence & Autonomy**

The most important outcome of this research is that the satisfaction of the Needs for Competence and Autonomy provides the strongest influence on game enjoyment. In terms of the games



players choose to play these individual needs remain linked as players choose games that they perceive to satisfy both. The construct is both the strongest predictor of enjoyment for all groups but also the constant influence on enjoyment, underlining the importance and significance of this construct in terms of the smartphone game experience.

It should be emphasized that this combination of the two constructs is a result of the research approach taken of this research seeking players overall enjoyment of the context.. Players will play games that they perceive to satisfy both needs. In order to test specific games it is recommended that the two constructs are tested apart. Appendix 1.3 of this thesis provides a specific example of how certain games may provide stronger satisfaction of either need. In particular, some games may be chosen to satisfy a perceived Need for Competence while others may be played in order for players to express themselves more and thus satisfy a perceived Need for Autonomy. The respondents of the survey undertaken for this thesis all expressed a varied taste in game genres and thus various games may be played to satisfy various needs at different times, which is an area worth further investigation.

Respondents play games that they perceive to satisfy both the Need for Competence and the Need for Autonomy. While the original theorization of the PENS Scales found that SDT's theorized needs for autonomy and competence independently predicted enjoyment (Ryan et al. 2006) this research in generalizing the scales found that they were not independent in the context of the games people choose to play. People return to a medium they find gratifies their perceived needs (Chen 2011) and in the case of this research, it is the satisfaction of the Needs for Competence and Autonomy that provide the strongest predictor of enjoyment and subsequent drive to play.

McGonigal (2011) explained that when a goal is truly compelling and the feedback (reflecting your competence) designed correctly we will keep playing a game longer. Good gameplay allows players to focus energy and optimism at something they are improving at or good at, thus facilitating enjoyment. Allowing players autonomy in how they achieve success in games will also increase their belief that they are responsible for the satisfaction of their competence needs. Video games are ‘hard fun’, in that we earn the emotional reward of pride in our achievements. This is what lies at the centre of the enjoyment of games. If a game is too easy or linear and denies players the opportunity to test themselves through the choices they make, it will deny the satisfaction of the two most important needs identified in this research of competence and autonomy.

McGonigal (2011) identifies a word adopted from the Italian language by game designers to signify an emotion for which the English language has no substitute. *Fiero* (pride) is the feeling of triumph over adversity and reflects a caveman craving in all humans for challenges they can all overcome. Games can facilitate this feeling more than other more passive forms of entertainment. This powerful feeling reflects the outcomes in this research for the influence of competence upon our enjoyment of games. Satisfying players needs for autonomy within games, can also re-enforce this *Fiero*. Mobile gaming provides an ever accessible potential source of this feeling.

Recent research from Shafer (2013) in comparing console and mobile games found that enjoyment of games is influenced by perceived skill on both platforms. The construct of perceived skill established in that research, reflects the findings of this thesis, in that Shafer (2013) found that perceived skill offered the strongest indication of enjoyment across console and mobile platforms. This perceived skill is directly reflective of satisfaction of the Need for Competence. The Need for Competence however provides a much more refined understanding of

how the consumption of smartphone games is intrinsically motivated through need satisfaction. On smartphones players can satisfy this basic need through demonstrating their own competence to themselves. This results in the player feeling good and reflects why players choose games that will allow for this need satisfaction. Players will not play games that are too easy or too difficult as this undermines their need to feel competent.

A good example of this phenomenon can be seen in the Angry Birds Games. Players need only achieve one out of three stars to progress to the next level but achieving two or three stars would reflect greater competence. The success of this game may be due to the fact that players can intrinsically determine which level of competence satisfies them. For some, finishing all levels may be enough to make them feel competent while others may strive to achieve perfection and three stars on each level. The star system acts as feedback to determine how competent a player feels. One key aspect is that players can continually go back and replay the short levels and improve their star score and subsequently increase their sense of competence.

This satisfaction of one of the fundamental needs inherent to all humans results in a positive mood. All people strive to feel competent in what they do and when they are competent at something, it increases intrinsic motivation to engage further in the activity. Through satisfying their Need for Competence through smartphone gaming, players may be compensating for a perceived lack of competence elsewhere in their lives. And smartphones are generally ever present on a person and as a result allows for players to satisfy this need as necessary.

Autonomy in games enhances player's perceptions of their own influence on the game outcomes and thus re-enforces perceived skill and subsequent satisfaction of the Need for Competence. Liu and Li (2011) posit that as 'cognitive concentration is a strong predictor of attitude and intention to use, mobile game designers should enhance the interactivity of games and challenge players

by designing games that fully involve users' cognitive abilities' (p. 897). Through the satisfaction of the Need for Competence & Autonomy, smartphone games can achieve this. Yet Autonomy can also be considered important as a need satisfaction in its own right.

One of Bartle's original player types were Explorers, players who didn't primarily want to achieve and feel competent in a game but instead were driven to see what the game had to offer and basically explore the options, choices and mysteries the game had to offer. One of the most popular games in the world, MineCraft, does not offer points, achievements or an ending but instead offers myriad of options and choices for players to create, build and explore. Games can be seen as sometimes facilitating expression, creativity and simple autonomy for players. Sometimes players simply want to play as they want, and as a result satisfy their Need for Autonomy.

The need to be autonomous can be seen as the universal urge to be causal agents of one's own life. Yet few domains in life remain truly autonomous. Domains such as school, work or family can thwart autonomy as individuals struggle with roles and responsibilities. Several respondents noted that they play games while waiting in the car to pick up their children. Responsibilities such as these, can deny people a sense of autonomy and even the choice to play games rather than read a newspaper can be seen as satisfying the Need for Autonomy. When playing games on a smartphone, the respondents of this research play games that allow them interesting choices and options that in turn create a perceived sense of autonomy. The resulting enjoyment and subsequently, short term well being, potentially compensates for a perceived lack of autonomy in life. The smartphone again provides players with an ever present opportunity to satisfy their need for autonomy as necessary.

Satisfaction of the Need for Competence remains one of the most important drivers to enjoy a game yet these findings provide evidence that the mobile game has truly evolved from the previous linear offerings of games (ESA, 2013, Appendix 1.5) in that players now demand autonomous choices and options in how they achieve this competence. Game designers and marketers alike must ensure that primarily games seek to achieve the satisfaction of these needs on smartphones and that as a result; games remain enjoyable to play and intrinsically motivated.

This research extends the established importance of these variables in the literature previously established (Ryan et al. 2006, Tamborini et al. 2010, Reinecke et al. 2012) and makes five significant observations. Firstly, it can be observed that the PENS scales can be extended to general play, rather than a specific play experience. Secondly, that the two concepts are conclusively linked in terms of game enjoyment as a result of this, as players choose games that satisfy both these needs. Thirdly, that the variables have validity in terms of the mobile game experience on a smartphone. Fourthly, the satisfaction of the Needs for Competence and Autonomy remains the single most important aspect in ensuring an optimal smartphone game experience. Finally it is proposed that the accessibility of games on the smartphone provides the perfect platform for players to satisfy these needs and improve their mood as necessary. This finding is explored in greater detail in Managerial Implications.

Satisfaction of the Needs for Competence and Autonomy remains conceptually the main driver of the enjoyment of play. Any play experience will not be enjoyable if players cannot experience some measure of success or retain some measure of control in how they play.

### **5.2.2 The Need for Relatedness**

Given the positive influence The Need for Relatedness has on enjoyment in terms of general mobile game play, it may be reasoned that when applied to specific multiplayer games, need

satisfaction would be greater. When the construct was tested using only survey respondents who played multiplayer it had a greater influence on enjoyment while it was not a significant driver of enjoyment for those who only played single player. These results indicate that the smartphone is indeed capable of satisfying people's need to feel connected to others through gaming.

Recent research by Park et al. (2014) investigated *social games*; defined as essentially casual games created to be played on portable devices with strangers or friends through social networks. While they identified enjoyment as the strongest determinant on intention to play, they also found that interaction with others is a key factor in making people want to play those particular games.

In the course of this research, focus has been on the intrinsic motivations in order to enjoy smartphone gaming but this leads to research questions concerning more extrinsic influences. Social Capital (Coleman 1988) is typically seen as an outcome in the form of resources and benefits accumulated through the social relationships and interactions among people. Huizinga's seminal work on play identified that 'Modern social life is being dominated to an ever-increasing extent by a quality that has something in common with play and yields the illusion of a strongly developed play-factor' (Huizinga 1938, p. 231). Given that traditional console gaming or the play of MMORPGs has centred on multiplayer and a shared interest in small niche pursuits, smartphone gaming may provide the opportunity for play as a social pursuit to hit a tipping point. In allowing short play periods on an ever present non-dedicated gaming device, there is potential for Huizinga's vision of modern social life being dominated by play, to be realised as a cultural mainstay.

In his seminal work, Kozinets (2001) identified the growing influence of consumer subcultures and how they can influence entertainment choices based on a shared commitment to a particular

mode of consumption. In effect how shared passion for something can lead to feeling connected. Simply playing the same game on a smartphone may allow a sense of connection. Playing with someone should enhance this connection in order to satisfy the Need for Relatedness. Muniz & O'Guinn (2001) extended this idea to brand communities, a social construct based around the mutual admiration of a particular brand, which provides evidence of the persistence of community in the wider consumer culture. Smartphone games remain brands that actively foster this sense of community through shared play and Social Networking. We are intrinsically motivated to engage in cultural communities or subcultures to feel related and connected to others.

Pre online gaming consoles, in 2003, Bryce and Rutter (2003) identified that gaming takes place as part of the leisure activity of family and existing social networks as well as a means of creating new networks of social relationships. The advent of mobile gaming and the recent successes of Candy Crush Saga and Clash of Clans would appear to have taken these concepts to a whole new level, in that the sheer volume of players playing these specific games has never been seen before.

Tauber (1972) identified social motives as one of the reasons people shop including, sharing of common interests, peer group attraction and status and authority. These concepts could today be applied to social mobile gaming, albeit with the former referring to game success as opposed to authority over sales assistants. According to Putnam (2000) social capital can be identified as either bonding or bridging. Bonding social capital focuses on strengthening the connection between people in their closely-connected groups. Bridging social capital focuses on reaching outside traditional in-groups to link with desirable others. Putnam (2000) identifies bonding social capital as exclusive in that it occurs between strongly tied individuals while bridging social capital can be seen to be inclusive to make or strengthen relationships on a network.

Rossi (2009) investigated gaming within Facebook and identified many different aspects of building bonding and bridging social capital. Games within Facebook offer opportunities to share and relate to each other outside of the actual game playing. Friends added as a result of the game rather than real life interactions further extend the users social network, in effect adding bridging social capital.

According to Williams (2006) gaming communities represent one of the modern incarnations of the 'third place' an area outside of home and work in which social capital can be created. Steinkuehler & Williams (2006) in investigating online role playing games as a third place found evidence that games foster both bonding and bridging capital but that in particular bridging capital was suited to the environment. Given the rapid rise of smartphone gaming in 2013 and the innately social nature of the two major successes, Candy Crush Saga and Clash of Clans, there would appear to be opportunities for further research on the links between the Need for Relatedness and the outcome of Social Capital, particularly since that interaction with others is a key factor in making people want to play those particular games (Park et al. 2014). This raises the further question of whether the Need for Relatedness is actually satisfied within games.

Based on these ideas of social capital and consumer subcultures, future research should consider altering the need from identifying feeling close to players *in* the game and instead consider the game as a social phenomenon outside of actual play. For example, 'I find the relationships I form in games on my phone fulfilling' could be changed to 'I find the relationships with the other people who play this game fulfilling' when the game doesn't explicitly have multiplayer but has social capabilities or cultural significance. This move to define relatedness as a connection surrounding the game rather than simply within games, reflects the theories of common interests, social capital and subcultures that surround modern gaming.



Interestingly, De Schutter and Malliet's (2014) recent study identified the Need for Connectedness as a need satisfaction of video games in that it refers to the desire to maintain contacts with others. This construct would appear as a valid support of the limitations of an intrinsically motivated approach, as utilised in this research, surrounding the social aspects of smartphone gaming.

However this research does provide the insight that the intrinsically motivated Need for Relatedness can be satisfied through smartphone gaming. While there remains a wider context of social capital and gaming subcultures, there is also satisfaction of a basic intrinsic need achieved through smartphone gaming. The smartphone provides an ever present, accessible medium that allows players to connect to others through a game. If a player feels lonely or disconnected, they can satisfy their intrinsic need to relate to others through a game as necessary.

The need for Relatedness remains an important consideration for any examination of the concept of play. Yet unlike the Needs for Competence & Autonomy, the experience of Flow and Mobile Escapism, satisfaction of the need for Relatedness may remain somewhat context specific in that not all play is social or socially orientated. Yet the previous arguments, in that the sharing of the play experience rather than the co-playing of the experience may have value, demonstrates that solo play may not always be a private experience. Players will share and form communities around interests that can be considered play. Reading may be considered play and be conducted privately yet books are discussed, shared and remain powerful cultural artefacts, allowing people to relate to others through a single player reading experience.

### **5.2.3 The experience of Flow**

The experience of Flow had a significant and positive influence on the enjoyment of games on smartphones. The experience of the flow state remains a sought after experience and is usually

only experienced when a person is intrinsically motivated and can experience clear goals, unambiguous feedback and a sense of control over the environment. Opportunities to experience flow may be limited in a person's general life yet the smartphone has changed this. Playing games on an ever present smartphone can allow players the opportunity to enjoy a flow experience amid the mundane hustle and bustle of everyday life. Smartphone games provide clear goals, direct feedback and control. They allow a player to immerse themselves in a rewarding experience and detach themselves from briefly from what is going on around them. As a result of this, players will enjoy games more.

Interestingly, McGonical (2011) tells us that when a player of video games is in a flow state the player wants to stay there therefore resulting in the quitting or winning/completion of a game as being equally unsatisfactory. This may go some way to explaining the success of games such as Clash of Clans and Candy Crush saga where there is no ending as such but the developers continue to add to the respective games' frameworks. Csikszentmihalyi (1997) makes a distinction between flow and enjoyment, describing enjoyment as an outcome of flow because it is only after we get out of flow that we might indulge in feeling happy. In effect players will feel satisfied and a sense of well being after they emerge from a gaming session in which they experience flow.

Recent developments such as an instrument to study flow in video games (Fang, Zhang & Chan 2013) may prove useful in future, as this research demonstrates that despite the casual nature and supposed shortened game times on smartphones, the flow experience is potentially important for games on this device. This research academically establishes the Flow experience as an important construct for our general understanding of the intrinsic motivations of mobile games.

It may be, given the nature of mobile gaming that the experience of flow may prove to be game and context specific in terms of this phenomenon. Certain games may result in flow in a different context. While playing a strategy game such as Clash of Clans in the living room players may become more absorbed than the a quick go at Candy Crush Saga waiting for a friend. Indeed the contextual use of smartphones may limit the opportunities for the flow experience; if for example, the friend arrives. Players who casually play games while watching TV may also not seek to experience flow. However the flow experience drives enjoyment meaning that players will seek games that support it.

One further point to consider may also be that the some respondents don't actually conceptualise themselves as in the flow state while playing games on a smartphone. Perhaps it is possible that the difficulties that have been inherent with self reporting of the usage variable (Kahn, Rattan & Williams 2014) could be extended to the flow variable in terms of games on a phone. People may not want to respond to the effect that they get lost in smartphone games and experience flow as there may be a certain internalised stigma inherent in that concept and sense of self. Potentially players don't equate play on a smartphone as having the potential to allow flow. Flow may have an even greater impact on enjoyment of smartphone games than reported by players.

Regardless, the experience of Flow does positively influence enjoyment and it may remain necessary to observe actual usage data collected from game developers to understand to what extent, in what contexts and through which game genres. Importantly, the Flow experience can now be theoretically situated in a playing paradigm previously regarded as casual and defined through short meaningless play sessions. The experience of Flow is an important intrinsic motivation that can explain the enjoyment and play of smartphone games.

## 5.2.4 Competition

In the case of this research, competition as an intrinsic motivation was found to have a non significant and potentially negative influence on the enjoyment of smartphone gaming. This can be seen as reflective of the medium as a whole for game playing despite the social nature of a lot of games. While this research found no differences between genders, Lucas et al. (2004) found that young males were significantly more motivated by competition than females so it may be possible to infer that traditional gaming platforms such as consoles in a living room generate more competition, particularly with the archetypal model of the young male gamer. This is reflected by Greenberg et al. (2010) finding that competition is most prevalent as a motive between boys aged 16-17 (A segment not examined in this research) and may be due to video games facilitating social interaction. Greenberg et al. (2010) acknowledge that ‘we may be observing more of a personal challenge than a competition against others’ (p. 17). This can be seen in the relative influences both competence and competition have on enjoyment, as established in this research, as while competence had a very strong positive effect, competition had a neutral or negative effect for all segments examined.

While Vorderer et al. (2003) identified that some individuals may experience more enjoyment from games due to preferences for engagement in competitive situations, this research finds that competition is not a positive influence on the enjoyment of games on smartphones. These findings do reflect recent research such as Delwiche and Henderson (2013) that confirmed, in terms of online games, that competition among players is low across different age groups but almost non-existent in regards to motivations for older players.

Although Vorderer et al. (2003) attempted to explain the role of competition as the most important determinant of enjoyment from video games, their view of one element of competition

can be seen as the satisfaction of the Need for Competence as they identified (non-social) competition in terms of players competing with the game itself in order to ‘master the challenge of the game situation and to reach the desired outcomes’ (p. 5) which is a concept, in effect, that is part of this research through the observation that satisfaction of the Need for Competence, in conjunction with the Need for Autonomy, is one of the strongest drivers of enjoyment.

Competition has been identified as one of the basic elements of intrinsically motivating activities (Csikszentmihalyi 1975, Deci & Ryan 1985) and was examined further in these terms in recent research by Liu, Li and Santhanam (2013) who through experimental game tournament research established that competition is a complex concept in terms of games but that one that merits further investigation across game genres. The satisfaction of the Need for Competence may represent the idea of competition on smartphones, as through satisfying this need, a player is meeting challenges inherent in the game. The construct of competition, however may not be without merit in terms of specific game experiences or genres where direct competition may feature as a large driver of the game design. The advent of directly competitive elements being incorporated into successful games such as Clash of Clans indicates that while competition is not important as present, the continued evolution of smartphone gaming remains a platform that may grow to foster a more competitive arena for players.

### **5.2.5 Mobile Escapism**

Through exploratory and confirmatory factor analysis, the construct of Social Escapism resulted in two separate constructs in this thesis. Of the two resultant constructs, Social Arousal was found to have no positive impact on enjoyment while Mobile Escapism had a significant and positive influence on enjoyment. This escapism reflects a new construct developed in the context of mobile consumption and as such, represents a new theoretical development in terms of

intrinsic motivation and mobile consumption. Escapism in the context examined here remains a mobile form of escapism in that it is always accessible. The accessibility of the smartphone allows for players to escape from what is around them at any times and provides an outlet that can potentially improve a player's state of mind. Activity in another context is the point of the escapism here in that it requires actual input from the player (Warmelink, Harteveld & Mayer 2009).

Warmelink et al. (2009) point to a trend towards negativity of the concept of escapism among game researchers yet identify that more mundane activities such as drinking tea or reading newspapers also represent escapism from the problems of daily life. As such, the impact of this construct may reflect the use of mobile games as casual time fillers or distractions and can be reconciled with most activities that allow a break from daily life. While, as the literature and qualitative responses in this research conclude, mobile game play is used as time filler when bored or waiting, potentially, other mediums such as social media may be used as escapist vehicles for different segments through serving the same purpose. For example, females are more likely to use social media than males (Duggan & Brenner 2013) and for older generations, perhaps mobile gaming does not offer the immersion afforded by traditional entertainment such as books or TV. Helpser (2010) identified that generational life stages, more than gender, influenced the use of most internet based services with aspects such as marriage and family meaning that younger and older generations used the internet for different purposes. A recent study by Shafer (2013) identified that mobile games, in providing an easy escape, may enhance a user's life through relieving stress, providing a quick but satisfying relief from responsibility and an otherwise lacklustre work experience. As a result of these considerations there remains a need to understand the role that mobile gaming plays in terms of individuals specific escapist needs

and it is recommended that a more in depth qualitative approach be utilised to further explore this aspect of play.

Mobile Escapism may prove a useful construct in evaluating smartphone motivations in alternate contexts. Different smartphone applications may provide escapist benefits to different populations and as a result, Mobile Escapism can deepen understanding in the variations of intrinsic motivations in the mobile context.

Reflecting that play reflects a change in perceived reality, the escapism reflected in this thesis represents an important component in terms of furthering our understanding of play. Play may allow us to feel competent, exercise our autonomy, get in the zone and interact with others but it also allows us to get away from it all. If play did not allow us to leave our adult worries behind us, would we engage in it at all?

### **5.3 Player Characteristics**

That the player characteristics of age, gender and playfulness did not impact on the conceptual model provides support for the model as a whole in terms of its encapsulation of the play.

There is a powerful assumption towards gaming and technology in general as being masculine which can result in females feeling less inclined towards gaming as it takes away from their femininity (Jenson & Castell 2010) yet through smartphone gaming females are motivated by satisfaction of the same needs of males and indeed in terms of this particular sample can be seen to play more. Kahn et al. (2014) identified a trend whereas the further away a players identity was from the stereotypical young male gamer a player was, the less likely they were to identify as a gamer, yet on smartphones females are as much a gamer as males and there were no significant differences between the two in terms of gamer type.

Previously it has seemed that females tended to have limited access to gameplay technologies (Jenson & Castell 2010) yet the smartphone has changed this through providing an easily accessible gaming device that is ever present. While video games have traditionally offered a space, that allow males to engage in dominance bonding and socialization (Richards 2013) the smartphone gaming context has provided a platform for females to potentially engage in multiplayer gaming and socialization.

Previously, Yee (2008) through examining the motivation for online games found no significant differences between genders in terms of escapist motivations. In the context of smartphone gaming, this research has identified that Mobile Escapism drives enjoyment of smartphone games equally for males and females. Greenberg et al. (2010) suggested that game designers needed to design games attuned more to females as they were the biggest potential market, perhaps the recent advent of smartphone gaming has finally satisfied that gap in the market

In terms of age there was no impact upon the conceptual model yet there are contextual factors that may warrant further and more in depth investigation. Williams and Page (2011) identified that Generation X is all about balancing family, life and work which allows consideration of the possible roles that mobile games play in their lives. Williams and Page (2011) also point to the fact that Baby Boomers are limited in their use and understanding of mobile technology and this finding is reflected in this research in that they prefer single player and less complex games. Generation Y, on the other hand, get bored easily and prefer novelty (Williams & Page 2011) so it may be that Generation Y while enjoying smartphone games, consider them more suitable for short bursts of play in between a myriad of alternative functions on their phone such as various social media and communication. Generation Y is the most tech savvy generation, due to early and frequent exposure to technology, and as a result has a complex and varied range of



motivations for information technology use (Bolton et al. 2013). For Generation Y, games on smartphones can potentially be conceptualized as part of a much greater entertainment paradigm.

Playfulness provides the most interesting results. Despite Qian and Yarnal's (2011) finding that playful people do experience and utilise leisure activities differently, in terms of the conceptual model there was no moderating influence in terms of playfulness. Playful people do not experience different intrinsic motivations to those who are less playful in terms of smartphone games and this particular model of play. Age and gender had no influence on enjoyment itself yet more playful people were the only player segment to enjoy games more, despite the fact that the entire sample played games and 50% of respondents played daily.

Recent research such as Shen, Chick and Zinn (2014) has developed a new measure of adult playfulness through building on existing work and empirically testing a new scale, the Adult Playfulness Trait Scale (APTS). They identify that in terms of playfulness 'it is desirable and sometimes necessary to develop a tailored instrument that (a) embodies the same conceptualization but taps the unique behavioural or affective indicators of a specific population and (b) accommodates group-specific characteristics that may affect assessment' (Shen, Chick & Zinn 2014, p. 78). The use of the Young Adult Playfulness Scale in this thesis can be seen to support this position. The definition of the scale as the predisposition to frame a situation in such a way as to provide oneself entertainment reconciles well with the conceptualization of mobile gaming while the scale has also proven valid across the varied characteristics of the targeted population.

This thesis establishes the scales as being suitable for use across a varied age range despite previous use of the scale specifically examining adults under thirty. Barnett originally suggested that the scale cannot be assumed to generalize to populations of a different age or circumstance,

yet this thesis supports the generalization of the scale. Furthermore this thesis maintains that the scale may still provide a potentially useful construct for investigating intrinsic motivations in a range of marketing and communication related studies that can allow for a fuller understanding of the influence of consumer characteristics on the consumption process.

That the player characteristics had no significant influence on the conceptual model provides support for the model itself in terms of how it conceptualises play. The Needs for Competence, Autonomy and Relatedness drive the enjoyment of the play experience yet are the same for players regardless of age, gender and playfulness. This reflects Przybylski et al. (2010) in that both the appeal and well-being effects of video games are based in their potential to satisfy basic psychological needs for competence, autonomy, and relatedness yet these needs remain universal and not subject to the influence of gender or age. That Przybylski et al. (2010) acknowledge that players choose games that facilitate the satisfaction of these needs further supports the position of this thesis in that perhaps the key differences in terms of age and gender remain their choice of games and play mode. Similarly escapism and the experience of flow can be seen as universal motivators that do not distinguish between age and gender in that players choose to play games that can support these experiences.

That the characteristic of playfulness does not influence the conceptual model can be considered as support for the model as representing play. Playful people have been shown to be significantly less prone to experience boredom in their free time, attributable to their ability to entertain themselves regardless of environment (Barnett 2010) and this may be reflected in that playful people enjoy smartphone games more, a context that is strongly linked to preventing boredom in this thesis. Yet that the core motivations towards enjoyment, the Needs for Competence, Autonomy and Relatedness, the Flow experiences and Mobile Escapism, are universally

significant across levels of playfulness, which dictates a potential robustness to the model in terms of representing the universal idea of play.

#### **5.4 The Contribution of this Thesis**

This thesis makes a number of original contributions that can contribute to both the gaming and marketing literature and add to our understanding of intrinsic motivation and play. These contributions can be summarized as follows.

The concept of play is encapsulated as a series of key intrinsic motivations; which, when satisfied will result in longer lasting impacts on various behaviors and outcomes. These five key drivers of enjoyment; satisfaction of the Needs for Competence, Autonomy and Relatedness plus the experiencing of Flow and Escapism can be seen as universal across age, gender and playfulness. As a result these outcomes can be utilized to further investigate the concept of play across a myriad of fields, contexts and functions.

This research extends the literature on Self Determination Theory and intrinsic motivation to the context of smartphone games and as a result, the increasingly important context of mobile consumption. Subsequently the three needs inherent to SDT can be seen as important intrinsic drivers of enjoyment provide the basis of a useful conceptual framework and starting point 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 any enjoyable gaming experience. These findings remain the most important contribution of this thesis as it answers the proposed research question of ‘Which constructs matter for the enjoyment of games and in effect will affect policy in designing games or gamification?’ and as such provides the most critical consideration for game design in the mobile context.

Further outcomes of this research provide more understanding of the intrinsic motivations of play. This thesis provides counter arguments to the idea of competition being the strongest motivation to play games (Greenberg et al. 2010) in the context of smartphone games. Instead smartphones, as an ever present, always accessible device offer a different experience that is intrinsically motivated by the Need for Relatedness, the experience of Flow and Mobile Escapism. Thus we can see that for some, games provide a means to connect with others and satisfy their need for Relatedness. This research is the first to empirically establish that the experience of Flow is an important intrinsic motivation in a context previously defined through short, casual play sessions. Finally Mobile Escapism as an outcome of this research is established as an important construct that supports the use of the smartphone as a relief from daily stress.

This thesis establishes the lack of importance of player characteristics of age, gender and playfulness in terms of their impact on intrinsic motivations within the mobile play context. No significant differences were found between all categorical segments in terms of the intrinsic motivations that drive enjoyment and as a result it can be seen that smartphones gamers are a homogenous group in terms of what drives their play experience. Game choice, usage and play mode can be seen as variable according to player characteristics and it is this that has implications for target market selection, marketing and game design.

This thesis is the first to apply the Young Adult Playfulness Scale in a consumer behavior context. This thesis also successfully extends previous use of the scale beyond adults under thirty. As a result, playfulness can be seen as a potentially viable and useful measure transcending age and gender that can have value in terms of understanding consumers. Despite the limited influence of the construct on the model of play situated in this thesis, it is recommended that the construct be further examined in alternative contexts.

This research contributes understanding for several managerial implications. The results of this thesis can provide insights for the application of gamification in fields such as health, education and marketing on an accessible platform that is almost ubiquitous. Furthermore this knowledge can further understanding in terms of games as services, advergaming and the freemium model.

The epistemology of this thesis offers a cross disciplinary approach to addressing the aporia inherent to this context. A strong focus on psychology was augmented with application and use of theories from varied areas of academic interest such as marketing, media and communications, information systems, education, health, social sciences and video gaming.

Finally, this thesis is the first to apply a model of intrinsic motivations for games on smartphones in a marketing or consumer behaviour context. This area of research and video games in general remains strangely underrepresented in discipline specific studies and this study provides one of the starting points for future research considerations. While previous studies such as Nysveen et al. (2005) recognized the potential importance of mobile services, this thesis reflects the subsequent growth of the mobile gaming industry and offers salient findings for use in both academic and practical fields.

## **5.5 Managerial Implications**

The managerial implications of this thesis can be situated in several relevant and increasingly important areas of interest to marketers and academics alike. A full discussion and more comprehensive overview of these implications can be found in Appendix 1.9.

The first consideration for managers is situated in the results of the conceptual model. Satisfaction of the Needs for Competence & Autonomy remains the most important consideration of any game design. An optimal smartphone game allows players a balanced challenge facilitated through varied options and choices. Once these needs are satisfied, players

will enjoy a game more. Further consideration should be given to allowing a social element of gaming to allow players to satisfy their Need for Relatedness. However competitive elements of any social gaming experience may not be beneficial to every game design. Furthermore designers should strive to facilitate the experience of Flow where possible in any game and understand that the game may serve as an escapist vehicle for some consumers. Facilitating these findings through game design should result in more enjoyment and subsequent well being of the player and desire to play again. These results underpin the managerial applications in this section.

The second consideration is that smartphone gamers are not homogenous in their choice of games and single or multiplayer. Gender, age and playfulness do not influence the intrinsic motivations for the enjoyment of smartphone games and as such game design should seek to reflect the model while identifying their relevant target market in terms of marketing and communication efforts. Younger gamers are more digitally savvy and more willing to play publicly, with others and play more varied games. Conversely, older gamers have simpler tastes in games and prefer to enjoy smartphone games privately. Those of high playfulness as a result representing the only segment to enjoy games more, would appear to be the optimal early adopters of games. These findings reflect the theoretical underpinnings of any managerial application in that it is important to understand your potential consumers.

### **5.5.1 Gamification**

Gamification has been defined as both gaming elements in non gaming contexts and the process of game-thinking and game mechanics to engage users and solve problems. The smartphone due to its accessibility and capabilities offers the perfect vehicle for gamified applications in marketing, health, work or educational fields. The results of this thesis provide support for a number of considerations when considering a gamified vehicle on a smartphone.

One obvious aspect for marketers when considering a gamification aspect may be that consumers view gamified apps as a means to win or earn rewards. Zichermann and Cunningham (2011) warn that over time, an excessive dependence on ‘free stuff’ or discounts, which is a form of extrinsic motivation, habituates players to constantly expect that as a condition of purchase. But it can be seen that in gamification terms that the reward for achievement most desired is reflective of the satisfaction of the Need for Competence, in that players want to achieve in the game. While this may be a strong argument for a focus on intrinsic motivation in terms of gamification design there still remains the need for the push for the adoption of system. Zichermann and Cunningham (2011) consider an optimal gamification design to be one that works better if and when intrinsic and extrinsic motivations are aligned. In effect, when designed well, it feels intrinsic to the player. Understanding and applying the results of this thesis can facilitate successful gamification.

### **5.5.2 Implications of this research for games as services and understanding the Freemium model**

The service paradigm, previously established in the games industry, had been one of games as commodities or goods, yet the advent of games as activities has opened up the an understanding of the value of games as services (Stenros & Sotamaa 2009). Basole and Karla (2012) identified that the mobile app store is playing a particularly transformative role in how value is created, delivered, distributed, and consumed with a special focus in all app stores placed on mobile gaming, as the majority of the most popular applications are mobile games. They reconciled this transformation with service-dominant (S-D) logic (Vargo & Lusch 2004, 2008), one of the central tenets of service science. S-D logic is based on the idea that service is the fundamental basis of value creation, that value is not created in the traditional sense of a producer to consumer supply chain but instead that all stakeholders in a service are interconnected in a service system.

The freemium model, where games are initially free but consumers make in app purchases can be seen as the most successful application of these concepts.

This thesis posits that the most important drivers of game enjoyment, satisfaction of the Needs for Competence & Autonomy are what drive successful games that follow the freemium model. Candy Crush Saga and Clash of Clans are the most successful freemium based games and both facilitate satisfaction of the Needs for Competence and Autonomy through purchases by players. While both games allow the satisfaction of these needs through free play, though, through purchasing upgrades players can increase the satisfaction of both needs.

Both game can also allow satisfaction of the Need for Relatedness. Candy Crush Saga, while not explicitly multiplayer, allows players to ‘help’ each other through social media platform such as Facebook. Clash of Clans is a multiplayer game that explicitly encourages players to play together as Clans that fosters a sense of community and relatedness. Both games can also allow players to experience flow through play and the design of the games allows both short and long play sessions depending on the level of escape players need.

### **5.5.3 Advergaming & In-Game Advertising**

The results of this research indicate quite clearly the importance of well designed advergaming. With a well designed game that satisfies the Needs for Competence, Autonomy and Relatedness and allows a sense of flow and escape, marketers can benefit from the resultant enjoyment of the game. In fact in terms of brand equity a poorly designed game may have a negative impact.

Martí-Parreño, Aldás-Manzano, Currás-Pérez and Sánchez-García (2013) demonstrated that in terms of a casual advergame, entertainment (enjoyment) is the primary driver of any resulting positive brand attitude and that any intrusiveness or incongruence has a negative effect. Yüksel



(2013) tells us that advergaming is about achieving an unforgettable experience for a player where any brand values or placements are covertly enhanced. Yüksel (2013) in particular stresses the importance of the player achieving the flow experience for success with any advergame. Mobile and smartphone games with their ubiquity, inbuilt social capabilities and cheap/free easily accessible download model possibly provide the ultimate vehicle for this particular medium.

In-game advertising remains an avenue of great potential. With most freemium customers accepting advertisements as the price of a free service (Wagner, Benlian & Hess 2013) and the success of this business model now established in terms of mobile gaming there remains further opportunities for advertising in this model that may be yet unexplored.

Central to both advergaming and in-game advertising remains a well designed game and this thesis offers results that can support an optimally designed game that drives enjoyment and subsequent success of any advertising.

#### **5.5.4 Mobile Marketing**

Mobile Marketing is defined as the use of the mobile device for marketing communications and its relevance as a medium is defined through four key characteristics; Ubiquity, personalization, two way communication and localization (Phumisak, Donyaprueth & Vatcharaporn 2010). Smartphone gaming representing an integral part of the mobile ecosystem and be seen to encapsulate these key characteristics.

Given that effective mobile promotion strategy requires the channel to be used as a complementary tool for traditional media (Phumisak et al. 2010) smartphone games could prove an effective part of relevant marketing mixes. Particularly given the trend towards games as

services where players are becoming more used to an ongoing relationship with suppliers (Liu, Au & Choi 2012). Satisfying the relevant intrinsic motivations established in this research however would be key to ensuring that any mobile game or gamified aspect of a communications strategy would prove beneficial.

Davis and Chaudhri (2012) define the whole mobile experience itself as important for marketers in that all services are being increasingly used to experience some form of play. This points to a use of the PENS scales beyond the explicit examination of play. Does an app engender satisfaction of the Needs for Competence, Autonomy or Relatedness? Is the Flow experience key to an apps success? Does a good app allow for escapism? Davis and Chaudhri's (2012) conclusions would indicate that yes, a good app would be suitable as being examined similarly to a game on a smartphone. It is recommended here that the conceptual model established here has the potential to be adapted and applied in terms of understanding the use of apps in general.

## **5.6 Directions for Future Research**

This conceptual model should be addressed in terms of specific game experiences to fully examine the potential of the model. A proposed game specific model is provided in appendix 1.3, which tests the model. These scales have been designed to specifically test the model with specific game experiences. The PENS scales utilised in this research remains to be tested in its entirety in terms of specific smartphone game experiences. Constructs such as presence and intuitive controls remain untested in terms of specific smartphone games and it is recommended that these constructs are examined where relevant.

This thesis is the first marketing research to utilize the Young Adult Playfulness Scales as part of a conceptual model. More research on the concept of adult playfulness needs to be undertaken before the association between this potential player characteristic and various media

consumption is more clearly understood. Given we are entering an era in which play continues to define more and more of our consumption experiences, use of this scale in further studies can further understanding of intrinsic motivation in an era of continued technological development.

This research is based on Australian residents and as such may have no bearing on studies situated in different cultural contexts. Chea and Kim (2013) have previously identified cultural differences as being major factors in mobile play across different countries. Extension of the model established in this research in alternative populations and cultures would provide a richer understanding of the intrinsic motivations of mobile consumption.

While this research provides an understanding of the typical mobile gamer, more in depth examination of particular segments may provide more illuminating results. Specific studies to examine contextual influences on segments such as students, working parents or retirees will allow for a fuller understanding of the role smartphone gaming plays in players' lives.

## **5.7 Limitations of the Research**

One of the main limitations (and strengths) of this research has been generalising the model to overall game play. While the Needs for Competence and Autonomy have clearly demonstrated value in general game play on smartphones it can be seen that constructs such as the Need for Relatedness, Competition and the experience of Flow may prove to be more game specific. Certain games such as Words with Friends or Chess for example may negate the need for flow given they may be played in short turn based considerations. Similarly these games may appeal to competitive players (as defined by this research) in that they are directly playing someone they know. The Need for Relatedness in its established form, only addresses those needs within games yet there remain entire subcultures and communities focused on the externalities of play and resultant social capital.

A large scale qualitative study on smartphone gameplay would be of benefit to our understanding of the phenomenon. While studies such as Hjorth and Richardson (2009) provide great insights it was limited to seventeen female game students. Mobile gaming has become mainstream and as a result there remains a need to understand a more diverse range of gamers. As an example, some qualitative insights gained in this research such as ‘I play while waiting for the kids in the car’ point to research opportunities in exploring parent’s use of games as a means of dealing with the stress of parenthood.

The lack of empirically sound usage variable also limits the research. Self reported usage remains a flawed measure. This can be demonstrated even in the findings of this research with 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 in obtaining such data, point to a need for academia to work more in conjunction with service providers. As opposed to merely rooting their findings in the literature and theoretical foundations, academics should seek partnerships with real life game developers in order to provide results grounded in real time developments.

Use of a market research company to solicit respondents may not be an optimal choice as the respondents may be over questioned, cynical and extrinsically motivated. With 119 from 459 surveys proving unusable post data cleaning, it can be seen that this approach is unreliable at times. This also points to a potential lack of validity in the accepted and utilised responses as these respondents may simply be going ‘through the motions’. This research recommends in future sourcing game related survey respondents from online forums and websites dedicated to gamers. This may skew samples in favour of more hardcore gamers but would possibly ensure a more considered and intrinsically motivated response. Wiersma (2011) identified that there can

generally be problems with the validity of online surveys in general, but it is recommended here that a move towards more intrinsically motivated respondents will generally result in less problems.

## **5.7 Conclusion**

Play and play like experiences continue to become an ever increasing influence in our world. This thesis utilises a rich context to enhance our understanding of this phenomenon through articulating a conceptual model that offers an understanding of play.

Smartphones are fast becoming the single most ubiquitous and accessible piece of personal technology throughout the world, and games are fast becoming one of the more pervasive uses for them. This thesis presents insights into what players really want from their games and provides insights into examples of how this has been achieved. At its core players want a game that; challenges them, allows autonomy in how they beat this challenge and allows them to get away from it all for a short while, in order to experience short term outcomes of well being.

Whether it is designing games for various purposes such as marketing, education, health or sheer fun it remains imperative that games satisfy these needs in order for players to enjoy the game. This will prove crucial for realising the end goal of any games based on smartphones. There are also differences between the players in terms of their age, gender, playfulness and expected outcomes. Designers and marketers should design in depth market research into their particular targeted segments of gamers in order to establish how their offerings can integrate themselves into the lives of their target audience.

This thesis offers insights at a practical level yet also adds to the academic literature in terms of contributing new knowledge at a consumer behaviour level. This thesis extends an understanding of and provides invaluable insight into the drivers of enjoyment of smartphone games by

introducing the constructs of the Needs for Competence, Autonomy and Relatedness as well as the experience of Flow and Mobile Escapism as influential drivers. It also identifies the lack of influence of age, gender and playfulness on this process. This thesis is therefore significant because through the development of a practical conceptual model, it has addressed this gap in the existing literature on consumer behaviour and smartphone gaming while providing rich findings that can allow us to extend our understanding of play itself.

The most important contribution of this thesis is that it offers a conceptual model of play that has the potential to illuminate our understanding of a relatively underexplored concept outside of children and psychological specific studies. Reflecting the definition of play as intrinsically motivated, as an escape from reality and frequently repeated, the conceptual model in this thesis can facilitate further enquiries into play itself. Players can be seen as desiring a feeling of competence, an expression of autonomy, the experience of flow, an escape from their lives and potentially, to relate to others, in order to enjoy themselves and experience short term boosts in well being. The context of smartphone gaming illuminates these findings in terms of this thesis yet given that these motivations transcend the influence of age, gender and playfulness, it is proposed here that the model of play depicted here has significant value given that the context itself continues to rise in prominence.

Crucially, smartphone games can be accessed as necessary for need satisfaction, to experience flow, to gain a sense of escapism and ultimately allow a player to experience a sense of enjoyment. 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. The core argument towards strongest how this research contributes to our knowledge of play, intrinsic motivation and why this context requires a different conceptualization lies in 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 is now available at the literal touch of a button.

## References

- Adamo, K. B., et al. (2010). "Effects of interactive video game cycling on overweight and obese adolescent health." Applied Physiology, Nutrition, and Metabolism **35**(6): 805-815.
- Adis, A. and K. H. Jun (2013). "Antecedents of Brand Recall and Brand Attitude towards Purchase Intention in advergames." European Journal of Business and Management **5**(18): 58-67.
- Aiken, L. S. and G. Stephen "West (1991)." Multiple regression: Testing and interpreting interactions: 75-87.
- Ajzen, I. (1991). "The theory of planned behavior." Organizational behavior and human decision processes **50**(2): 179-211.
- Alpert, F. (2007). "Entertainment software: suddenly huge, little understood." Asia Pacific Journal of Marketing and Logistics **19**(1): 87-100.
- Arbuckle, J. L. (2011). "IBM SPSS Amos 20 user's guide." Amos Development Corporation, SPSS Inc.
- Armitage, C. J. and M. Conner (2001). "Efficacy of the theory of planned behaviour: A meta-analytic review." British journal of social psychology **40**(4): 471-499.
- Arsenault, D. (2009). "Video game genre, evolution and innovation." Eludamos. Journal for Computer Game Culture **3**(2): 149-176.
- Bagozzi, R. P. (2007). "The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift." Journal of the Association for Information Systems **8**(4): 244-254.
- Bandura, A. (1977). Social Learning Theory, Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1989). "Human agency in social cognitive theory." American psychologist **44**(9): 1175.
- Bandura, A. (2001). "Social cognitive theory of mass communication." Media Psychology **3**(3): 265-299.
- Baranowski, T., et al. (2011). "Video game play, child diet, and physical activity behavior change: A randomized clinical trial." American Journal of Preventive Medicine **40**(1): 33-38.



Barko, T. and T. D. Sadler (2013). "Practicality in virtuality: finding student meaning in video game education." Journal of Science Education and Technology **22**(2): 124-132.

Barnett, L. A. (1990). "Playfulness: Definition, design, and measurement." Play & Culture.

Barnett, L. A. (1991). "Characterizing playfulness: Correlates with individual attributes and personality traits." Play & Culture.

Barnett, L. A. (1991). "The playful child: Measurement of a disposition to play." Play & Culture: Play & Culture.

Barnett, L. A. (2007). "The nature of playfulness in young adults." Personality and Individual Differences **43**(4): 949-958.

Barnett, L. A. (2011). "Playful People: Fun is in the Mind of the Beholder." Imagination, Cognition and Personality **31**(3): 169-197.

Barnett, L. A. (2011a). "How Do Playful People Play? Gendered and Racial Leisure Perspectives, Motives, and Preferences of College Students." Leisure Sciences **33**(5): 382-401.

Baron, R. M. and D. A. Kenny (1986). "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations." Journal of personality and social psychology **51**(6): 1173.

Bartle, R. (1996). "Hearts, clubs, diamonds, spades: Players who suit MUDs." Journal of MUD research **1**(1): 19.

Basole, R. C. and J. Karla (2012). "Value transformation in the mobile service ecosystem: A Study of App Store Emergence and Growth." Service Science **4**(1): 24-41.

Baumeister, R. F. and M. R. Leary (1995). "The need to belong: desire for interpersonal attachments as a fundamental human motivation." Psychological bulletin **117**(3): 497.

Bertozzi, E. (2008). "'You Play Like a Girl!' Cross-Gender Competition and the Uneven Playing Field." Convergence: The International Journal of Research into New Media Technologies **14**(4): 473-487.

Bjorklund, D. F. (2007). *Why youth is not wasted on the young*. Malden, MA: Blackwell Publishing

Blumler, J. G. and E. Katz (1974). The uses of mass communications: Current perspectives on gratifications research, Sage publications Beverly Hills, CA.

Boase, J. and R. Ling (2013). "Measuring Mobile Phone Use: Self-Report Versus Log Data." Journal of Computer-Mediated Communication **18**(4): 508-519.

Boellstorff, T. (2006). "A ludicrous discipline? Ethnography and game studies." Games and Culture **1**(1): 29-35.

Bolton, R. N., et al. (2013). "Understanding Generation Y and their use of social media: a review and research agenda." Journal of Service Management **24**(3): 245-267.

Bourdieu, P. (1985). "The social space and the genesis of groups." Theory and society **14**(6): 723-744.

Bowman, N. D. (2010). The effect of task demand on mood repair and selective exposure to video games, Michigan State University.

Bowman, N. D. and R. Tamborini (2013). "'In the Mood to Game': Selective exposure and mood management processes in computer game play." New Media & Society: 1461444813504274.

Bozionelos, N. (1996). "Psychology of computer use: XXXIX. Prevalence of computer anxiety in British managers and professionals." Psychological Reports **78**(3): 995-1002.

Brougère, G. (1999). "Some Elements Relating to Children's Play and Adult Simulaton/Gaming." Simulation & Gaming **30**(2): 134-146.

Brown, T. A. (2012). Confirmatory factor analysis for applied research, Guilford Press.

Bryant, J., et al. (2006). "Selective exposure to video games." Playing video games: Motives, responses, and consequences: 181-194.

Bryant, J. E. and P. E. Vorderer (2006). Psychology of entertainment, Lawrence Erlbaum Associates Publishers.

Bryce, J. and J. Rutter (2003). "Gender dynamics and the social and spatial organization of computer gaming." Leisure Studies **22**(1): 1-15.

Casey, S., et al. (2007). The gopher game: a social, mobile, locative game with user generated content and peer review, ACM.

Castells, M., et al. (2004). The mobile communication society: A cross-cultural analysis of available evidence on the social uses of wireless communication technology. International Workshop on Wireless Communication Policies and Prospects: A Global Perspective.

CGA (2014). "Games Market Sector Report: Smartphone & Tablet Gaming 2013." Retrieved April 02, 2014, from <http://casualconnect.org/research-reports/>.

Chan, D. (2008). "Convergence, connectivity, and the case of Japanese mobile gaming." Games and Culture 3(1): 13-25.

Chee, F. M. and S. Kim (2013). "Transformative mobile game culture: Sociocultural analysis of Korean mobile gaming in the era of smartphones." International Journal of Cultural Studies: 1367877913507473.

Chen, G. M. (2011). "Tweet this: A uses and gratifications perspective on how active Twitter use gratifies a need to connect with others." Computers in Human Behavior 27(2): 755-762.

Chen, H., et al. (1999). "Optimal experience of Web activities." Computers in Human Behavior 15(5): 585-608.

Chen, J. (2007). "Flow in games (and everything else)." Communications of the ACM 50(4): 31-34.

Chen, Y. S. and A. A. Raney (2009). Mood management and highly interactive video games: An experimental examination of Wii playing on mood change and enjoyment.

Chiang, Y.-T. and S. S. Lin (2010). "Early adolescent players' playfulness and psychological needs in online games." Social Behavior and Personality: an international journal 38(5): 627-636.

Chiou, W.-B. and C.-S. Wan (2006). A further investigation on the motives of online games addiction. National Educational Computing Conference, San Diego, USA.

Choi, D. and J. Kim (2004). "Why people continue to play online games: In search of critical design factors to increase customer loyalty to online contents." Cyberpsychology & behavior 7(1): 11-24.

Choi, D. H., et al. (2007). "ERP training with a web-based electronic learning system: The flow theory perspective." International Journal of Human-Computer Studies **65**(3): 223-243.

Chou, T. J. and C. C. Ting (2003). "The role of flow experience in cyber-game addiction." Cyberpsychology & behavior **6**(6): 663-675.

Christensen, C. and P. Prax (2012). "Assemblage, adaptation and apps: Smartphones and mobile gaming." Continuum **26**(5): 731-739.

Chu, K., et al. (2013). Soft Key and Hard Key Mobile Input Devices on Player Experience for Mobile Gaming. Advances in Visual Informatics, Springer: 347-357.

Chua, S. N. and R. Koestner (2008). "A self-determination theory perspective on the role of autonomy in solitary behavior." The Journal of social psychology **148**(5): 645-648.

Churchill Jr, G. A. (1979). "A paradigm for developing better measures of marketing constructs." Journal of marketing research: 64-73.

Chuttur, M. (2009). "Overview of the technology acceptance model: Origins, developments and future directions."

Coleman, J. S. (1988). "Social capital in the creation of human capital." American journal of sociology: 95-120.

Cooper, H. M. (1998). Synthesizing research: A guide for literature reviews, Sage.

Corliss, J. (2011). "Introduction: The Social Science Study of Video Games." Games and Culture **6**(1): 3-16.

Cowley, B., et al. (2008). "Toward an understanding of flow in video games." Computers in Entertainment (CIE) **6**(2): 20.

Csikszentmihalyi, M. (1991). Flow: The psychology of optimal experience, Harper Perennial.

Csikszentmihalyi, M. (1997). "Happiness and creativity: Going with the flow." Futurist **31**(5): 27.

Csikszentmihalyi, M. and I. Csikszentmihalyi (1975). Beyond boredom and anxiety, Jossey-Bass Publishers San Francisco, CA.

Csikszentmihalyi, M. and J. LeFevre (1989). "Optimal experience in work and leisure." Journal of personality and social psychology **56**(5): 815.

Csikszentmihalyi, M. and F. Massimini (1985). "On the psychological selection of bio-cultural information." New Ideas in Psychology.

David, R. and L. Picker (2014). "'Candy Crush' Maker King Files IPO With Listing in New York ". Retrieved June 18th 2014.

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results, Massachusetts Institute of Technology.

Davis, F. D., et al. (1992). "Extrinsic and intrinsic motivation to use computers in the workplace1." Journal of Applied Social Psychology **22**(14): 1111-1132.

Davis, R. and A. A. Chaudhri (2012). "Conceptualizing Play in Mobile Commerce Environment." International Journal of Mobile Marketing **7**(2).

De Schutter, B. and S. Malliet (2014). "The older player of digital games: A classification based on perceived need satisfaction." Communications **39**(1): 67-88.

Deci, E. L., et al. (1999). "A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation." Psychological bulletin **125**(6): 627.

Deci, E. L. and R. M. Ryan (1985). Intrinsic motivation and self-determination in human behavior, Springer.

Deci, E. L. and R. M. Ryan (2000). "The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior." Psychological inquiry **11**(4): 227-268.

Deci, E. L. and R. M. Ryan (2011). "Self-determination theory." Handbook of Theories of Social Psychology: Collection: Volumes 1 & 2: 416.

Deci, E. L., et al. (1991). "Motivation and education: The self-determination perspective." Educational psychologist **26**(3-4): 325-346.

Delwiche, A. A. and J. J. Henderson (2013). "The Players They are A-Changin': The Rise of Older MMO Gamers." Journal of Broadcasting & Electronic Media **57**(2): 205-223.

Demetrovics, Z., et al. (2011). "Why do you play? The development of the motives for online gaming questionnaire (MOGQ)." Behavior research methods **43**(3): 814-825.

Dennett, D. C. (1989). The intentional stance, The MIT press.

Derby, S.-J. (2010). IBISWorld Industry Report X0007 Video Games in Australia.

DeShazo, J., et al. (2010). "Effective intervention or child's play? A review of video games for diabetes education." Diabetes Technology & Therapeutics **12**(10): 815-822.

Deterding, S. (2011). Situated motivational affordances of game elements: A conceptual model. Gamification: Using Game Design Elements in Non-Gaming Contexts, a workshop at CHI.

Deterding, S., et al. (2011). From game design elements to gamefulness: defining gamification. Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, ACM.

Deterding, S., et al. (2011). Gamification. using game-design elements in non-gaming contexts. PART 2-----Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems, ACM.

Donna, L. and H. T. P. Novak (1997). "A new marketing paradigm for electronic commerce." The Information Society **13**(1): 43-54.

Dredge, S. (2013). "Mobile gaming's rise is a headache for Sony and Nintendo." Retrieved November 25th 2013, from <http://www.theguardian.com/technology/appsblog/2013/sep/25/mobile-games-apple-google-sony-nintendo>.

Dredge, S. (2013b). "PewDiePie unseats Miley Cyrus as world's most popular YouTube channel." from <http://www.theguardian.com/technology/2013/nov/08/pewdiepie-miley-cyrus-youtube-videos>.

Dredge, S. (2014). "Why is Candy Crush Saga so popular?". Retrieved May 17th 2014, from <http://www.theguardian.com/technology/2014/mar/26/candy-crush-saga-king-why-popular>.

Dredge, S. (2014a). "Angry Birds: Rovio talks freemium games, Stella and Toons disruption." Retrieved April 02, 2014, from <http://www.theguardian.com/technology/2014/mar/10/angry-birds-epic-stella-toons-freemium-sxsw>.

Duggan, M. and J. Brenner (2013). The demographics of social media users, 2012, Pew Research Center's Internet & American Life Project.

Eccles, J. S. and A. Wigfield (2002). "Motivational beliefs, values, and goals." Annual review of psychology **53**(1): 109-132.

Economist, T. (2011). "All the World's a Game."

Ellison, N. B., et al. (2007). "The benefits of Facebook "friends:" Social capital and college students' use of online social network sites." Journal of Computer-Mediated Communication **12**(4): 1143-1168.

Ellison, N. B., et al. (2011). "Connection strategies: Social capital implications of Facebook-enabled communication practices." New Media & Society **13**(6): 873-892.

Emarketer (2014). "Smartphone Users Worldwide Will Total 1.75 Billion in 2014 ". Retrieved April 17th, 2014, from <http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536>.

Engl, S. and L. E. Nacke (2012). "Contextual Influences on Mobile Player Experience—A Game User Experience Model." Entertainment Computing.

Ermi, L. and F. Mäyrä (2005). "Fundamental components of the gameplay experience: Analysing immersion." Worlds in play: International perspectives on digital games research: 37.

ESA (2013). "The Evolution of Mobile Games." Retrieved April 2nd, 2014, from <http://www.theesa.com/games-improving-what-matters/mobile-games.asp>.

Euromonitor (2013 ). "Mobile Cocooning: How growing reliance on smart devices is influencing consumer behaviour ". from <http://www.euromonitor.com/>.

Falaki, H., et al. (2010). Diversity in smartphone usage. Proceedings of the 8th international conference on Mobile systems, applications, and services, ACM.

Fang, X., et al. (2013). "Development of an Instrument for Studying Flow in Computer Game Play." International Journal of Human-Computer Interaction **29**(7): 456-470.

Feehan, K. (2014). "Why Angry Birds is quickly becoming the most successful brand in the world." Retrieved March 02, 2014, from <http://www.techreviewer.co.uk/2-billion-downloads-why-angry-birds-is-quickly-becoming-the-most-successful-brand-in-the-world/>.

Feijoo, C., et al. (2012). "Mobile gaming: Industry challenges and policy implications." Telecommunications Policy **36**(3): 212-221.

Festinger, L. (1957). A theory of cognitive dissonance, Stanford Univ Press.

Finneran, C. M. and P. Zhang (2003). "A person–artefact–task (PAT) model of flow antecedents in computer-mediated environments." International Journal of Human-Computer Studies **59**(4): 475-496.

Fitz-Walter, Z. and D. W. Tjondronegoro (2011). Exploring the opportunities and challenges of using mobile sensing for gamification and achievements. UbiComp 11: Proceedings of the 2011 ACM Conference on Ubiquitous Computing, ACM Press.

Frederick, C. M. and R. M. Ryan (1995). "Self-determination in sport: A review using cognitive evaluation theory." International Journal of Sport Psychology; International Journal of Sport Psychology.

Gagné, M. and E. L. Deci (2005). "Self-determination theory and work motivation." Journal of Organizational behavior **26**(4): 331-362.

Gartner (2013). "Gartner Says Worldwide Video Game Market to Total \$93 Billion in 2013." Retrieved May 6th 2014, from <http://www.gartner.com/newsroom/id/2614915>.

Gaskell, A. (2013). "Gamification Market to be Worth \$5.5 Billion by 2018." Retrieved April 15th 2014, from <http://technorati.com/social-media/article/gamification-market-to-be-worth-55/>.

Gee, J. P. (2003). "What video games have to teach us about learning and literacy." Computers in Entertainment (CIE) **1**(1): 20-20.

Gerbing, D. W. and J. G. Hamilton (1996). "Viability of exploratory factor analysis as a precursor to confirmatory factor analysis." Structural Equation Modeling: A Multidisciplinary Journal **3**(1): 62-72.

Ghani, J. A. and S. P. Deshpande (1994). "Task Characteristics and the Experience of Optimal Flow in Human—Computer Interaction." The Journal of psychology **128**(4): 381-391.



Glynn, M. A. and J. Webster (1992). "The adult playfulness scale: An initial assessment." Psychological Reports **71**(1): 83-103.

Glynn, M. A. and J. Webster (1993). "Refining the nomological net of the adult playfulness scale: Personality, motivational, and attitudinal correlates for highly intelligent adults." Psychological Reports **72**(3): 1023-1026.

Goh, D. H. L., et al. (2012). "'I played games as there was nothing else to do': Understanding motivations for using mobile content sharing games." Online Information Review **36**(6): 784-806.

Gosling, V. K. and G. Crawford (2011). "Game scenes: Theorizing digital game audiences." Games and Culture **6**(2): 135-154.

GranTurismo (2014). "GT Academy 2014 Introduction." Retrieved May 7th 2014, from <http://www.gran-turismo.com/us/academy/2014/faq/>.

Greenberg, B. S., et al. (2010). "Orientations to video games among gender and age groups." Simulation & Gaming **41**(2): 238-259.

Griffiths, M. D., et al. (2004). "Demographic factors and playing variables in online computer gaming." CyberPsychology & Behavior **7**(4): 479-487.

Groh, F. (2012). "Gamification: State of the art definition and utilization." Institute of Media Informatics Ulm University: 39-47.

Ha, I., et al. (2007). "Determinants of adoption of mobile games under mobile broadband wireless access environment." Information & Management **44**(3): 276-286.

Hainey, T., et al. (2011). "The differences in motivations of online game players and offline game players: A combined analysis of three studies at higher education level." Computers & Education **57**(4): 2197-2211.

Hair, J., et al. (2006). *Multivariate Data Analysis*, NJ: Pearson Prentice Hall.

Hair, J., et al. (2008). Marketing Research, McGraw-Hill/Irwin.

Hall, J. A. (2011). "Sex differences in friendship expectations: A meta-analysis." Journal of Social and Personal Relationships **28**(6): 723-747.

Haridakis, P. and G. Hanson (2009). "Social interaction and co-viewing with YouTube: Blending mass communication reception and social connection." Journal of Broadcasting & Electronic Media **53**(2): 317-335.

Hartmann, T. (2009). "Action theory, theory of planned behavior and media choice." Media choice: A theoretical and empirical overview: 32.

Hefner, D., et al. (2007). "Identification with the player character as determinant of video game enjoyment." Entertainment Computing–ICEC 2007: 39-48.

Heitkötter, H., et al. (2013). Evaluating cross-platform development approaches for mobile applications. Web Information Systems and Technologies, Springer: 120-138.

Heyman, G. D. and C. S. Dweck (1992). "Achievement goals and intrinsic motivation: Their relation and their role in adaptive motivation." Motivation and Emotion **16**(3): 231-247.

Hildebrand, J. (2012). Games Consumers Play: The Construction, Maintenance, and Defense of Elective Identity Through Play, UNIVERSITY OF ILLINOIS AT CHICAGO.

Hirschman, E. C. (1983). "Aesthetics, ideologies and the limits of the marketing concept." The Journal of Marketing: 45-55.

Hjorth, L. (2007). "The Game of Being Mobile One Media History of Gaming and Mobile Technologies in Asia-Pacific." Convergence: The International Journal of Research into New Media Technologies **13**(4): 369-381.

Hjorth, L. (2011). "Mobile@ game cultures: The place of urban mobile gaming." Convergence: The International Journal of Research into New Media Technologies **17**(4): 357-371.

Hjorth, L., et al. (2012). "Studying the mobile: locating the field." Studying Mobile Media: Cultural Technologies, Mobile Communication, and the iPhone: 1-11.

Hjorth, L. and I. Richardson (2009). "The waiting game: Complicating notions of (tele) presence and gendered distraction in casual mobile gaming." Australian Journal of Communication **35**(7): 23-35.

Hoffman, B. and L. Nadelson (2010). "Motivational engagement and video gaming: a mixed methods study." Educational Technology Research and Development **58**(3): 245-270.

Hoffman, D. L. and T. P. Novak (1996). "Marketing in hypermedia computer-mediated environments: conceptual foundations." The Journal of Marketing: 50-68.

Hoffman, D. L. and T. P. Novak (2009). "Flow online: lessons learned and future prospects." Journal of Interactive Marketing **23**(1): 23-34.

Holbrook, M. B., et al. (1984). "Play as a consumption experience: The roles of emotions, performance, and personality in the enjoyment of games." Journal of Consumer Research: 728-739.

Hooper, D., Coughlan, J. & Mullen, M. R. (2008). "Structural Equation Modelling: Guidelines for Determining Model Fit." The Electronic Version of Business Research Methods **6**(1): 53-60.

Hou, J. (2011). "Uses and gratifications of social games: Blending social networking and game play." First Monday **16**(7-4).

Hsiao, K.-L. (2013). "Android Smartphone adoption and intention to pay for mobile Internet: perspectives from software, hardware, design, and value." Library Hi Tech **31**(2): 3-3.

Hsu, C. L. and H. P. Lu (2004). "Why do people play on-line games? An extended TAM with social influences and flow experience." Information & Management **41**(7): 853-868.

Huizinga, J. (1938). Homo ludens: A study of the play-element in culture, Taylor & Francis.

Huotari, K. and J. Hamari (2011). Gamification” from the perspective of service marketing. Proc. CHI 2011 Workshop Gamification.

Huotari, K. and J. Hamari (2012). Defining gamification: a service marketing perspective. Proceeding of the 16th International Academic MindTrek Conference, ACM.

Hyland, D. (1978). "Competition and friendship." Journal of the Philosophy of Sport **5**(1): 27-37.

IGEA (2014). "Digital Australia 2014." Retrieved August 1st 2014, from <http://www.igea.net/2013/10/digital-australia-2014/>.

James, J. (2001). Mobile Gaming: An Introduction to the Mobile Gaming Market. Mobile Streams Ltd. Retrieved September 1, 2001.

Jegers, K. (2007). "Pervasive game flow: understanding player enjoyment in pervasive gaming." Computers in Entertainment (CIE) **5**(1): 9.

Jenkins, H. (2006). Convergence culture: Where old and new media collide, NYU press.

Jenson, J. and S. De Castell (2010). "Gender, simulation, and gaming: Research review and redirections." Simulation & Gaming **41**(1): 51-71.

Jin, S. A. A. (2012). "'Toward Integrative Models of Flow': Effects of Performance, Skill, Challenge, Playfulness, and Presence on Flow in Video Games." Journal of Broadcasting & Electronic Media **56**(2): 169-186.

Johnson, D. and J. Gardner (2010). Personality, motivation and video games. Proceedings of the 22nd Conference of the Computer-Human Interaction Special Interest Group of Australia on Computer-Human Interaction, ACM.

Joines, J. L., et al. (2003). "Exploring motivations for consumer Web use and their implications for e-commerce." Journal of consumer marketing **20**(2): 90-108.

Juul, J. (2012). A casual revolution: Reinventing video games and their players, The MIT Press.

Kahn, A. S., et al. (2014). "Why We Distort in Self-Report: Predictors of Self-Report Errors in Video Game Play." Journal of Computer-Mediated Communication.

Kallio, K. P., et al. (2011). "At least nine ways to play: approaching gamer mentalities." Games and Culture **6**(4): 327-353.

Kano, A., et al. (2010). Thumbs-up scale and frequency of use scale for use in self reporting of children's computer experience. Proceedings of the 6th Nordic Conference on Human-Computer Interaction: Extending Boundaries, ACM.

Karlson, A. K., et al. (2010). Mobile taskflow in context: a screenshot study of smartphone usage, ACM.

Kim, H.-M. (2013). "Mobile Media Technology and Popular Mobile Games in Contemporary Society." International Journal of Mobile Marketing **8**(2).

Kimiecik, J. C. and A. T. Harris (1996). "What is enjoyment? A conceptual/definitional analysis with implications for sport and exercise psychology." Journal of Sport & Exercise Psychology **18**(3): 247-263.

Kleijnen, M., et al. (2004). "Consumer adoption of wireless services: discovering the rules, while playing the game." Journal of Interactive Marketing **18**(2): 51-61.

Kleijnen, M., et al. (2003). "Factors influencing the adoption of mobile gaming services." Mobile commerce: Technology, theory, and applications: 202.

Klimmt, C. and T. Hartmann (2006). "Effectance, self-efficacy, and the motivation to play video games." Playing video games: Motives, responses, and consequences: 133-145.

Klimmt, C., et al. (2007). "Effectance and control as determinants of video game enjoyment." Cyberpsychology & behavior **10**(6): 845-848.

Klug, G. C. and J. Schell (2006). "Why people play games: An industry perspective." Playing video games: Motives, responses, and consequences: 91-100.

Knobloch-Westerwick, S. (2006). "Mood management: Theory, evidence, and advancements."

Ko, H., et al. (2005). "Internet uses and gratifications: A structural equation model of interactive advertising." Journal of Advertising **34**(2): 57-70.

Korgaonkar, P. K. and L. D. Wolin (1999). "A multivariate analysis of web usage." Journal of advertising research **39**(1): 53-68.

Korzaan, M. L. (2003). "Going with the flow: Predicting online purchase intentions." Journal of Computer Information Systems **43**(4): 25-31.

Kozinets, R. V. (2001). "Utopian enterprise: Articulating the meanings of Star Trek's culture of consumption." Journal of Consumer Research **28**(1): 67-88.

Krcmar, M. and Y. Strizhakova (2009). "Uses and Gratifications as Media Choice." Media Choice: A Theoretical and Empirical Overview, Taylor & Francis, Hoboken, NJ: 53-69.

Kruger, A. (1995). "The Adult Playfulness Scale: A review." Psychology: A Journal of Human Behavior **32**(2): 36-38.

Kultima, A. (2009). Casual game design values. Proceedings of the 13th international MindTrek conference: Everyday life in the ubiquitous era, ACM.

Lafrenière, M.-A. K., et al. (2012). "Development and validation of the Gaming Motivation Scale (GAMS)." Personality and Individual Differences **53**(7): 827-831.

Lages, L. F. and J. C. Fernandes (2005). "The SERPVAL scale: a multi-item instrument for measuring service personal values." Journal of Business Research **58**(11): 1562-1572.

LaRose, R. (2009). "Social cognitive theories of media selection." Media choice: A theoretical and empirical overview: 10-31.

LaRose, R. and M. S. Eastin (2004). "A social cognitive theory of Internet uses and gratifications: Toward a new model of media attendance." Journal of Broadcasting & Electronic Media **48**(3): 358-377.

Lazzaro, N. (2005). "Why we play games: Four keys to more emotion without story." Design **18**: 1-8.

Lee, K. M., et al. (2009). "Effects of computer/video games and beyond." Media effects: Advances in theory and research. Third edition. New York: Routledge: 551-566.

Lee, M. C. (2009). "Understanding the behavioural intention to play online games: an extension of the theory of planned behaviour." Online Information Review **33**(5): 849-872.

Lengwiler, Y. (2004). "A monetary policy simulation game." The Journal of Economic Education **35**(2): 175-183.

Leslie, A. M. (1994). "ToMM, ToBy, and Agency: Core architecture and domain specificity." Mapping the mind: Domain specificity in cognition and culture: 119-148.

Levitt, T. (1980). Marketing success through differentiation-of anything, Graduate School of Business Administration, Harvard University.

Ley, B., et al. (2013). "Impacts of new technologies on media usage and social behaviour in domestic environments." Behaviour & Information Technology(ahead-of-print): 1-14.

Li, D., et al. (2011). "Examining the influence of actual-ideal self-discrepancies, depression, and escapism, on pathological gaming among massively multiplayer online adolescent gamers." Cyberpsychology, Behavior, and Social Networking **14**(9): 535-539.

Li, K. A. and S. Counts (2007). Exploring social interactions and attributes of casual multiplayer mobile gaming. Proceedings of the 4th international conference on mobile technology,

applications, and systems and the 1st international symposium on Computer human interaction in mobile technology, ACM.

Liang, T.-P. and Y.-H. Yeh (2011). "Effect of use contexts on the continuous use of mobile services: the case of mobile games." Personal and Ubiquitous Computing **15**(2): 187-196.

Lieberman, D. A. (1998). "Health Education Video Games for Children and Adolescents: Theory, Design, and Research Findings."

Lieberman, J. N. (1965). "Playfulness and divergent thinking: An investigation of their relationship at the kindergarten level." The Journal of Genetic Psychology: Research and Theory on Human Development.

LIEBERMAN, J. N. (1966). "Playfulness: An attempt to conceptualize a quality of play and of the player." Psychological Reports **19**(3f): 1278-1278.

Lieberman, J. N. (1977). Playfulness: Its relationship to imagination and creativity, Academic Press New York.

Liebl, M. (2014). "Clash of Clans: Clan Wars 'Battle Day' explained." Retrieved April 6th 2014, from <http://www.gamezone.com/news/2014/04/04/clash-of-clans-clan-wars-battle-day-explained>.

Liu, C. Z., et al. (2012). "An Empirical Study of the Freemium Strategy for Mobile Apps: Evidence from the Google Play Market."

Liu, D., et al. (2013). "Digital games and beyond: what happens when players compete?" MIS Quarterly **37**(1): 111-124.

Liu, Y. and H. Li (2011). "Exploring the impact of use context on mobile hedonic services adoption: An empirical study on mobile gaming in China." Computers in Human Behavior **27**(2): 890-898.

Low, G., et al. (2011). A study of motivations for using mobile content sharing games. Digital Information Management (ICDIM), 2011 Sixth International Conference on, IEEE.

Luarn, P. and H. H. Lin (2005). "Toward an understanding of the behavioral intention to use mobile banking." Computers in Human Behavior **21**(6): 873-891.

Lucas, K. and J. L. Sherry (2004). "Sex differences in video game play: A communication-based explanation." Communication research **31**(5): 499-523.

Mangold, W. G. and D. J. Faulds (2009). "Social media: The new hybrid element of the promotion mix." Business horizons **52**(4): 357-365.

Martí-Parreño, J., et al. (2013). "Factors contributing brand attitude in advergames: Entertainment and irritation." Journal of Brand Management **20**(5): 374-388.

Mashable (2013). "The 15 Countries With the Highest Smartphone Penetration." Retrieved May 16th, 2014, from <http://mashable.com/2013/08/27/global-smartphone-penetration/>.

Maslow, A. H. (1943). "A theory of human motivation." Psychological review **50**(4): 370.

Mathwick, C. and E. Rigdon (2004). "Play, flow, and the online search experience." Journal of Consumer Research **31**(2): 324-332.

Mayra, F. (2006). "A moment in the life of a generation (Why game studies now?)." Games and Culture **1**(1): 103.

Mäyrä, F. (2008). Play in the mobile Internet: towards contextual gaming. Internet Research **9**.

McCarty, J. A. and L. Shrum (1993). "The role of personal values and demographics in predicting television viewing behavior: Implications for theory and application." Journal of Advertising: 77-101.

McCrea, C. (2011). "We play in public: The nature and context of portable gaming systems." Convergence: The International Journal of Research into New Media Technologies **17**(4): 389-403.

McGonigal, J. (2011). Reality is broken: Why games make us better and how they can change the world, Penguin.

McKenzie, G. (2011). Gamification and Location-based Services. Workshop on Cognitive Engineering for Mobile GIS.

Meade, A. W. and S. B. Craig (2012). "Identifying careless responses in survey data." Psychological methods **17**(3): 437.



Meece, J. L., et al. (2006). "Gender and motivation." Journal of School Psychology **44**(5): 351-373.

Metacritic (2011). "Best Video Games of 2010." Retrieved August 4th 2014, from <http://www.metacritic.com/feature/best-video-games-of-2010?page=2>.

Mihalich, J. C. (1982). Sports and athletics: Philosophy in action, Littlefield, Adams.

MobiThinking (2013). "Global mobile statistics 2013 Section E: Mobile apps, app stores, pricing and failure rates." Retrieved May 7th 2014, from <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats/e>.

Moon, J. W. and Y. G. Kim (2001). "Extending the TAM for a World-Wide-Web context." Information & Management **38**(4): 217-230.

Moore, C. (2011). "The magic circle and the mobility of play." Convergence: The International Journal of Research into New Media Technologies **17**(4): 373-387.

Muniz Jr, A. M. and T. C. O'guinn (2001). "Brand community." Journal of Consumer Research **27**(4): 412-432.

Myers, D. (2006). "Signs, symbols, games, and play." Games and Culture **1**(1): 47.

Nabi, R. L., et al. (2006). "Emotional and cognitive predictors of the enjoyment of reality-based and fictional television programming: An elaboration of the uses and gratifications perspective." Media Psychology **8**(4): 421-447.

Nakamura, J. (1988). Optimal experience and the uses of talent.

Naliuka, K., et al. (2010). Supporting immersive location-based games on resource-constrained platforms. Proceedings of the 7th International Conference on Advances in Computer Entertainment Technology, ACM.

NewZoo (2013). "Mobile Games Market to Double in Size by 2016." Retrieved November 1st 2013, from <http://www.newzoo.com/infographics/infographic-the-global-mobile-landscape/>.

Novak, T. P. and D. L. Hoffman (1997). "Measuring the flow experience among web users." Interval Research Corporation **31**.

Novak, T. P., et al. (2003). "The influence of goal-directed and experiential activities on online flow experiences." Journal of Consumer Psychology **13**(1): 3-16.

Novak, T. P., et al. (2000). "Measuring the customer experience in online environments: A structural modeling approach." Marketing Science **19**(1): 22-42.

Novak, T. P., et al. (2000). "Measuring the customer experience in online environments: A structural modeling approach." Marketing Science: 22-42.

Nysveen, H., et al. (2005). "Intentions to use mobile services: antecedents and cross-service comparisons." Journal of the Academy of Marketing Science **33**(3): 330-346.

Oerter, R. (1999). "The Psychology of Play. A theoretical approach to implementation. Weinham: Beltz."

Ohler, P. and G. Nieding (2006). "Why play? An evolutionary perspective." Playing video games: motives, responses, and consequences. Mahwah, NJ: Erlbaum.

Okazaki, S. (2008). "Exploring experiential value in online mobile gaming adoption." Cyberpsychology & behavior **11**(5): 619-622.

Okazaki, S. and C. R. Taylor (2013). "Social media and international advertising: theoretical challenges and future directions." International Marketing Review **30**(1): 56-71.

Okazaki, S. and M. J. Yagüe (2012). "Responses to an advergaming campaign on a mobile social networking site: An initial research report." Computers in Human Behavior **28**(1): 78-86.

Olobatuyi, M. E. (2006). A user's guide to path analysis, University Press of America.

Olson, C. K. (2010). "Children's motivations for video game play in the context of normal development." Review of General Psychology **14**(2): 180.

Park, E., et al. (2014). "Determinants of player acceptance of mobile social network games: An application of extended technology acceptance model." Telematics and Informatics **31**(1): 3-15.

Park, H. J. and S.-H. Kim (2013). "A Bayesian network approach to examining key success factors of mobile games." Journal of Business Research **66**(9): 1353-1359.

Parker, R., et al. (2014). "How technological change affects power relations in global markets: remote developers in the console and mobile games industry." Environment and Planning A **46**(1): 168-185.

Peng, W., et al. (2012). "Need Satisfaction Supportive Game Features as Motivational Determinants: An Experimental Study of a Self-Determination Theory Guided Exergame." Media Psychology **15**(2): 175-196.

Penttinen, E., et al. (2012). "Mobile games: Analyzing the needs and values of the consumers." Journal of Information Technology Theory and Application (JITTA) **11**(1).

Phumisak, S., et al. (2010). "Mobile marketin: Implications for marketing strategies"  
" International Journal of Mobile Marketing **5**(2): 126-139.

Piaget, J. (2013). Play, dreams and imitation in childhood, Routledge.

Prensky, M. (2003). "Digital game-based learning." Computers in Entertainment (CIE) **1**(1): 21-21.

Prot, S., et al. (2012). "Video Games: Good, Bad, or Other?" Pediatric Clinics of North America **59**(3): 647-658.

Prugsamatz, S., et al. (2010). "Modelling consumer entertainment software choice: An exploratory examination of key attributes, and differences by gamer segment." Journal of Consumer Behaviour **9**(5): 381-392.

Przybylski, A. K., et al. (2010). "A motivational model of video game engagement." Review of General Psychology **14**(2): 154.

Przybylski, A. K., et al. (2009). "The motivating role of violence in video games." Personality and Social Psychology Bulletin **35**(2): 243-259.

Przybylski, A. K., et al. (2009). "Having to versus wanting to play: Background and consequences of harmonious versus obsessive engagement in video games." CyberPsychology & Behavior **12**(5): 485-492.

Qian, X. L. and C. Yarnal (2011). "The role of playfulness in the leisure stress-coping process among emerging adults: an SEM analysis." Leisure/Loisir **35**(2): 191-209.

Raney, A. A., et al. (2006). "Adolescents and the appeal of video games." Playing video games: Motives, responses, and consequences: 165-179.

Reeve, J. and E. L. Deci (1996). "Elements of the competitive situation that affect intrinsic motivation." Personality and Social Psychology Bulletin **22**: 24-33.

Reinecke, L., et al. (2012). "Characterizing mood management as need satisfaction: The effects of intrinsic needs on selective exposure and mood repair." Journal of Communication **62**(3): 437-453.

Renninger, K. (2000). "Individual interest and its implications for understanding intrinsic motivation."

Rentfrow, P. J., et al. (2011). "Listening, watching, and reading: The structure and correlates of entertainment preferences." Journal of personality **79**(2): 223-258.

Revels, J., et al. (2010). "Understanding consumer intention to use mobile services." Australasian Marketing Journal (AMJ) **18**(2): 74-80.

Richard, G. (2013). "Gender and Game Play: Research and Future Directions." Playing with Virtuality, Theories and Methods of Computer Game Studies, Peter Lang: 269-284.

Richardson, I. (2011). "The hybrid ontology of mobile gaming." Convergence: The International Journal of Research into New Media Technologies **17**(4): 419-430.

Rigby, S. (2004). "Player Motivational Analysis: A model for applied research into the motivational dynamics of virtual worlds." Motivation Research Group, University of Rochester, Rochester, NY.

Rigby, S. and R. Ryan (2011). Glued to games: How video games draw us in and hold us spellbound, Praeger.

Ritterfeld, U. and R. Weber (2006). "Video games for entertainment and education." Playing Video Games-Motives, Responses, and Consequences: 399-413.

Rodebaugh, T. L., et al. (2007). "The reverse of social anxiety is not always the opposite: The reverse-scored items of the Social Interaction Anxiety Scale do not belong." Behavior Therapy **38**(2): 192-206.

Rogers, E. M. (1995). Diffusion of innovations, Free Pr.

Rose, M. (2013). "Clash of Clans' 5 keys to success." Retrieved November 7th 2013, from [http://www.gamasutra.com/view/news/185406/Clash\\_of\\_Clans\\_5\\_keys\\_to\\_success.php#.USgPSFrwIZQ](http://www.gamasutra.com/view/news/185406/Clash_of_Clans_5_keys_to_success.php#.USgPSFrwIZQ).

Rosenkrans, G. and K. Myers (2012). "Mobile Advertising Effectiveness." International Journal of Mobile Marketing 7(3).

Rossi, L. (2009). "Playing your network: gaming in social network sites." Proceedings of DiGRA 2009: Breaking New Ground: Innovation in Games, Play, Practice and Theory.

Rubin, A. M. (1981). "An examination of television viewing motivations." Communication Research--An International Quarterly 8(2): 141-165.

Rubin, A. M. (1983). "Television uses and gratifications: The interactions of viewing patterns and motivations." Journal of Broadcasting & Electronic Media 27(1): 37-51.

Rubin, A. M. (2002). "The uses-and-gratifications perspective of media effects."

Ruggiero, T. E. (2000). "Uses and gratifications theory in the 21st century." Mass Communication & Society 3(1): 3-37.

Ryan, R. M. (1982). "Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory." Journal of personality and social psychology 43(3): 450.

Ryan, R. M. and J. P. Connell (1989). "Perceived locus of causality and internalization: Examining reasons for acting in two domains." Journal of personality and social psychology 57(5): 749.

Ryan, R. M. and E. L. Deci (2000a). "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being." American psychologist 55(1): 68.

Ryan, R. M. and E. L. Deci (2000b). "Intrinsic and extrinsic motivations: Classic definitions and new directions." Contemporary educational psychology 25(1): 54-67.

Ryan, R. M., et al. (1997). "Intrinsic motivation and exercise adherence." International Journal of Sport Psychology 28: 335-354.

Ryan, R. M., et al. (1983). "Relation of reward contingency and interpersonal context to intrinsic motivation: A review and test using cognitive evaluation theory." Journal of personality and social psychology **45**(4): 736.

Ryan, R. M., et al. (1995). "Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout." Addictive behaviors **20**(3): 279-297.

Ryan, R. M., et al. (2006). "The motivational pull of video games: A self-determination theory approach." Motivation and Emotion **30**(4): 344-360.

Schmitt, T. A. (2011). "Current methodological considerations in exploratory and confirmatory factor analysis." Journal of Psychoeducational Assessment **29**(4): 304-321.

Schumacker, R. E. and R. G. Lomax (2004). A beginner's guide to structural equation modeling, Psychology Press.

Seger, J. and R. Potts (2012). "Personality Correlates of Psychological Flow States in Videogame Play." Current Psychology: 1-19.

Sensis (2013). "Yellow Pages Social Media Report 2012." Retrieved March 15th, 2013, from <http://about.sensis.com.au/Media-Releases/?ItemID=1159>.

Shafer, D. M. (2013). "An Integrative Model of Predictors of Enjoyment in Console versus Mobile Video Games." PsychNology Journal **11**(2).

Shaffer, D. W., et al. (2005). "Video games and the future of learning." Phi delta kappan **87**(2): 104.

Shankar, V. and S. Balasubramanian (2009). "Mobile marketing: a synthesis and prognosis." Journal of Interactive Marketing **23**(2): 118-129.

Sheldon, K. M., et al. (1996). "What makes for a good day? Competence and autonomy in the day and in the person." Personality and Social Psychology Bulletin **22**: 1270-1279.

Shen, X., et al. (2014). "Playfulness in adulthood as a personality trait: a reconceptualization and a new measurement." Journal of Leisure Research **46**(1): 58-83.

Sherry, J. L. (2004). "Flow and media enjoyment." Communication theory **14**(4): 328-347.

Sherry, J. L. (2004b). "Media effects theory and the nature/nurture debate: A historical overview and directions for future research." Media Psychology **6**(1): 83-109.

Sherry, J. L., et al. (2006). "Video game uses and gratifications as predictors of use and game preference." Playing video games: Motives, responses, and consequences: 213-224.

Shontell, A. (2013). "Supercell Is A New \$770 Million Startup, And It Generates \$2.4 Million Per Day." Retrieved November 5th 2013, from <http://finance.yahoo.com/news/supercell-770-million-startup-generates-195038041.html>.

Sicilia, M., et al. (2005). "Effects of interactivity in a web site: The moderating effect of need for cognition." Journal of Advertising **34**(3): 31-44.

Sierra, J. J. and H. A. Taute (2014). "Experiential Consumption of Video Game and In-Show Ads: Phenomenological Explanation through Thought Experimentation." Journal of Research for Consumers(24).

Silvia, P. J. (2005). "What is interesting? Exploring the appraisal structure of interest." Emotion **5**(1): 89.

Smedlund, A. (2012). "Value cocreation in service platform business models." Service Science **4**(1): 79-88.

Soh, J. O. B. and B. C. Y. Tan (2008). "Mobile gaming." Communications of the ACM **51**(3): 35-39.

Solnit, A. J. (1998). "Beyond play and playfulness." Psychoanalytic study of the child **53**: 102-110.

Sotamaa, O. (2002). All The World's A Botfighter Stage: Notes on Location-based Multi-User Gaming. CGDC Conf., Citeseer.

Stanne, M. B., et al. (1999). "Does competition enhance or inhibit motor performance: a meta-analysis." Psychological bulletin **125**(1): 133.

Starbuck, W. H. and J. Webster (1991). "When is play productive?" Accounting, Management and Information Technologies **1**(1): 71-90.

Steinfeld, C., et al. (2008). "Social capital, self-esteem, and use of online social network sites: A longitudinal analysis." Journal of Applied Developmental Psychology **29**(6): 434-445.

Steinkuehler, C. A. (2006). "Why game (culture) studies now?" Games and Culture **1**(1): 97-102.

Steinkuehler, C. A. and D. Williams (2006). "Where everybody knows your (screen) name: Online games as "third places"." Journal of Computer-Mediated Communication **11**(4): 885-909.

Stenros, J., et al. (2009). The many faces of sociability and social play in games. Proceedings of the 13th International MindTrek Conference: Everyday Life in the Ubiquitous Era, ACM.

Stenros, J. and O. Sotamaa (2009). Commoditization of helping players play: Rise of the service paradigm. DiGRA 2009 Conference Proceedings.

Sterlicchi, J. (2007). "Nintendo's Wii console captures new game market." Retrieved October 7th 2013, from <http://www.theguardian.com/business/2007/oct/10/usnews.internationalnews>.

Stuart, K. (2014). "Kevin Spacey to star in Call of Duty: Advanced Warfare." Retrieved May 18th 2014, from <http://www.theguardian.com/technology/2014/may/02/kevin-spacey-call-of-duty-advanced-warfare>.

Sutton-Smith, B. (2001). The ambiguity of play, Harvard Univ Pr.

Sweetser, P. and P. Wyeth (2005). "GameFlow: a model for evaluating player enjoyment in games." Computers in Entertainment (CIE) **3**(3): 3-3.

Szentgyorgyi, C., et al. (2008). Renegade gaming: practices surrounding social use of the Nintendo DS handheld gaming system, ACM.

Tabachnick, B. G. and L. S. Fidell (2001). "Using multivariate statistics."

Takahashi, D. (2013). "Supercell's chief wants every game to be as good as Clash of Clans." Retrieved April 9th, 2014, from <http://venturebeat.com/2013/11/25/supercells-ilkka-paananen-wants-every-game-to-be-as-good-as-clash-of-clans-interview-part-one/>.

Tamborini, R., et al. (2010). "Defining media enjoyment as the satisfaction of intrinsic needs." Journal of Communication **60**(4): 758-777.

Tamborini, R., et al. (2011). "Media enjoyment as need satisfaction: The contribution of hedonic and nonhedonic needs." Journal of Communication **61**(6): 1025-1042.



Tauber, E. M. (1972). "Why do people shop?" Journal of marketing **36**(4).

Tauer, J. M. and J. M. Harackiewicz (1999). "Winning isn't everything: Competition, achievement orientation, and intrinsic motivation." Journal of Experimental Social Psychology **35**(3): 209-238.

Taylor, D. G., et al. (2011). "Mobile Application Adoption by Young Adults: A Social Network Perspective."

Terlutter, R. and M. L. Capella (2013). "The gamification of advertising: Analysis and research directions of in-game advertising, advergaming, and advertising in social network games." Journal of Advertising **42**(2-3): 95-112.

ThinkGaming (2014 ). "Top Grossing iOS games." Retrieved August 6th, 2014, from <http://thinkgaming.com/app-sales-data/>.

Thom, J., et al. (2012). Removing gamification from an enterprise SNS. Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work, ACM.

Tobin, S., et al. (2010). "An ecological approach to prospective and retrospective timing of long durations: A study involving gamers." PloS one **5**(2): e9271.

Tojib, D. R. and Y. Tsarenko (2008). "Determinants of mobile entertainment use: A conceptual model." URL: [http://www.anzmac2008.org/\\_Proceedings/PDF S 15](http://www.anzmac2008.org/_Proceedings/PDF S 15).

Trepte, S., et al. (2011). "The social side of gaming: How playing online computer games creates online and offline social support." Computers in Human Behavior.

Trevino, L. K. and J. Webster (1992). "Flow in Computer-Mediated Communication Electronic Mail and Voice Mail Evaluation and Impacts." Communication research **19**(5): 539-573.

Unger, L. S. and J. B. Kernan (1983). "On the meaning of leisure: An investigation of some determinants of the subjective experience." Journal of Consumer Research: 381-392.

Vansteenkiste, M., et al. (2010). "The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions." Advances in motivation and achievement **16**: 105-165.

Vargo, S. L. and R. F. Lusch (2004). "Evolving to a new dominant logic for marketing." Journal of marketing **68**(1): 1-17.

Vargo, S. L. and R. F. Lusch (2008). "Service-dominant logic: continuing the evolution." Journal of the Academy of marketing Science **36**(1): 1-10.

Venkatesh, V. and F. D. Davis (2000). "A theoretical extension of the technology acceptance model: Four longitudinal field studies." Management science: 186-204.

von Salisch, M., et al. (2006). "What attracts children." Playing video games: Motives, responses, and consequences: 147-147.

Vorderer, P. (2000). Interactive entertainment and beyond. D. Zillmann, & P. Vorderer (Eds.), Media entertainment: The psychology of its appeal (pp. 21–36). Mahwah, NJ: Erlbaum.

Vorderer, P. (2001). "It's all entertainment--sure. But what exactly is entertainment? Communication research, media psychology, and the explanation of entertainment experiences." Poetics **29**(4-5): 247-261.

Vorderer, P. (2003). "Entertainment theory." Communication and emotion: Essays in honor of Dolf Zillmann: 131-153.

Vorderer, P., et al. (2006). "Playing video games as entertainment." Playing video games: Motives, responses, and consequences: 1-7.

Vorderer, P., et al. (2003). Explaining the enjoyment of playing video games: the role of competition. Proceedings of the second international conference on Entertainment computing, Carnegie Mellon University.

Vorderer, P., et al. (2004). "Enjoyment: At the heart of media entertainment." Communication theory **14**(4): 388-408.

Vorderer, P., et al. (2006). Motivation Psychology of Entertainment J. Bryant and P. Vorderer. London Lawrence Erlbaum Associates 3-17.

Vos, L. and R. Brennan (2010). "Marketing simulation games: student and lecturer perspectives." Marketing Intelligence & Planning **28**(7): 882-897.

Wagner, J. (2011). "Anytime/anywhere; playing catch up with the mind of the smartphone consumer."

International Journal of Mobile Marketing 6(1): 28-53.

Wagner, T. M., et al. (2013). The Advertising Effect of Free--Do Free Basic Versions Promote Premium Versions within the Freemium Business Model of Music Services? System Sciences (HICSS), 2013 46th Hawaii International Conference on, IEEE.

Wan, C. S. and W. B. Chiou (2006). "Psychological Motives and Online Games Addiction: A Test of Flow Theory and Humanistic Needs Theory for Taiwanese Adolescents." Cyberpsychology & behavior 9(3): 317-324.

Warmelink, H., et al. (2009). Press Enter or Escape to play: Deconstructing escapism in multiplayer gaming. Proceedings of DiGRA.

Watkins, J., et al. (2012). "Wising up: Revising mobile media in an age of smartphones." Continuum 26(5): 665-668.

Watson, C., et al. (2013). "Consumer attitudes towards mobile marketing in the smart phone era." International Journal of Information Management 33(5): 840-849.

Webster, J. and J. J. Martocchio (1992). "Microcomputer playfulness: development of a measure with workplace implications." Mis Quarterly: 201-226.

Wei, P.-S. and H.-P. Lu (2014). "Why do people play mobile social games? An examination of network externalities and of uses and gratifications." Internet Research 24(3): 3-3.

Wells, A. J. (1988). "Self-esteem and optimal experience."

Wetzel, R., et al. (2011). "Designing Mobile Augmented Reality Games." Handbook of Augmented Reality: 513-539.

White, R. W. (1959). "Motivation reconsidered: The concept of competence." Psychological review 66(5): 297.

Wiersma, W. (2011). The Validity of Surveys: Online and Offline, Oxford Internet Institute.

Williams, D. (2006). "Why game studies now? Gamers don't bowl alone." Games and Culture 1(1): 13-16.

Williams, K. C. and R. A. Page (2011). "Marketing to the Generations." Journal of Behavioral Studies in Business **3**(1): 37-53.

Wilson, J., et al. (2011). "Distractedly engaged: Mobile gaming and convergent mobile media." Convergence: The International Journal of Research into New Media Technologies **17**(4): 351-355.

Wood, R. T. A., et al. (2007). "Experiences of time loss among videogame players: An empirical study." Cyberpsychology & behavior **10**(1): 38-44.

Wu, J. and H. Du (2012). "Toward a better understanding of behavioral intention and system usage constructs." European Journal of Information Systems **21**(6): 680-698.

Yee, N. (2006). "Motivations for play in online games." Cyberpsychology & behavior **9**(6): 772-775.

Yee, N. (2008). "Maps of digital desires: Exploring the topography of gender and play in online games." Beyond Barbie and Mortal Kombat: New perspectives on gender and gaming: 83-96.

Yi, M. Y. and Y. Hwang (2003). "Predicting the use of web-based information systems: self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model." International Journal of Human-Computer Studies **59**(4): 431-449.

Yoo, Y. (2010). "Computing in everyday life: A call for research on experiential computing." Mis Quarterly **34**(2): 213-231.

Yoon, G., et al. (2013). "Gamers just want to have fun? Toward an understanding of the online game acceptance." Journal of Applied Social Psychology **43**(9): 1814-1826.

Yoon, G. and P. T. Vargas (2013). "Seeing Without Looking: The Effects of Hemispheric Functioning on Memory for Brands in Computer Games." Journal of Advertising **42**(2-3): 131-141.

Yüksel, M. (2013). "Framing Online Games Positively: Entertainment and Engagement through 'Mindful Loss' of Flow." The Immersive Internet: Reflections on the Entangling of the Virtual with Society, Politics and the Economy: 148.

Zaiț, A. and P. E. Berteau (2011). "Methods for Testing Discriminant Validity." Management & Marketing Journal **9**(2).

Zhou, Z. and Y. Bao (2002). "Users' Attitudes toward Web Advertising: Effects of Internet Motivation and Internet Ability." Advances in Consumer Research **29**(1).

Zichermann, G. and C. Cunningham (2011). Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps, O'Reilly Media.

Zichermann, G. and J. Linder (2010). Game-based marketing: inspire customer loyalty through rewards, challenges, and contests, Wiley.

Zichermann, G. and J. Linder (2013). The Gamification Revolution: How Leaders Leverage Game Mechanics to Crush the Competition, McGraw Hill Professional.

Zillmann, D. (1988). "Mood management through communication choices." American Behavioral Scientist.

## **Appendices**

## Appendix 1.1 Why do you play games on your phone?

Boredom/pass time Papacharissi & Rubin (2010) utilized the item 'Because it passes time when bored' to explain internet usage motivations and did not separate the concepts (Bpt)

Fun/Enjoyment FE, Relaxation Rx, Challenge/mental stimulation CMS, Convenience Con, Social Reasons SR

Can you describe why you play games on your phone? (optional)

- it is fun
- when i am free and bored **Bpt**
- pass time because bored or up with my son **Bpt**
- passing time while waiting for something **Bpt**
- Mainly because I am bored **Bpt**
- because it can kill time and be addictive sometimes **Bpt**
- for fun
- bored **Bpt**
- Because I am bored and have nothing better to do (employment is impossible in a country town at the moment -.-) **Bpt**
- Just enjoy the fun and challenge. Brain numbing kinda fun.
- To pass the time and because I enjoy games that have an artful style/interesting design/unique gameplay. **Bpt**
- to kill time **Bpt**
- I enjoy the challenge that games provide
- cause im bored **Bpt**
- pass time **Bpt**
- boredom and fun **Bpt**
- To fill time **Bpt**
- Pass time **Bpt**
- Stimulation when bored, distraction from work **Bpt**
- Because I get bored when there is nothing to do **Bpt**
- To kill time. **Bpt**
- Fun
- to pass time and escape relaity **Bpt**
- To pass time **Bpt**
- to pass the time when i'm bored **Bpt**
- To pass time **Bpt**
- only when i'm a little bored and have nothing to do **Bpt**
- boredom **Bpt**
- It's portable so I can do it anywhere (like when in the toilet).
- for killing some time **Bpt**

- something to do to pass the time **Bpt**
- Pass the time at work **Bpt**
- Boredom **Bpt**
- past time **Bpt**
- Fun
- just to unwind
- pass the time **Bpt**
- Break from work, connect with friends, enjoy the games, keeps my mind active **Bpt**
- because its fun
- its fun and can play them anywhere
- Because I'm bored **Bpt**
- It is a good way to pass time. **Bpt**
- to keep my mind active so i am not bored. **Bpt**
- have fun
- To pass the time. **Bpt**
- Bored **Bpt**
- to bore myself stupid when I can't sleep **Bpt**
- fun fun
- Convenience
- cause i can :-)
- some are good for your brain activity so word games are good for that
- I LIKE IT
- to fill in spare time while waiting **Bpt**
- Because the phone is always with you. If you get some spare time you can play
- they're fun to play and challenging
- relax
- Why not? Its a fun way to pass time. **Bpt**
- pass the time **Bpt**
- boredom **Bpt**
- fun
- Just to pass time if I am free. **Bpt**
- for something to do or when theres spare time chills me out **Bpt**
- its a lot quicker to start and finish
- It makes me sharper and helps with improving my brain in old age
- because I am totally fasinated by the technology
- for the fun of it and they keep the mind active
- keep my mind active and I don't like being idle
- fun
- I like games that make me think ,the smartphone allows me to play multiple games of that nature e.g.. I currently have 21 live words with friends games
- For relaxation, as a diversion and as a challenge (Angry Birds)
- when I feel like a challeng
- its portable
- To pass the time **Bpt**
- To pass time **Bpt**
- There are some new and different games on my phone, different to my PS3 and XBOX360



- Keep mind occupied
- Waiting for busses **Bpt**
- because its fun and its a challenge
- to have something to do during breaks **Bpt**
- kill some time **Bpt**
- when I am bored with playing on the x box **Bpt**
- To pass the time **Bpt**
- It really is just to pass the time. **Bpt**
- To kill time when I am waiting for something **Bpt**
- to relax
- bored **Bpt**
- only when I am waiting for an appointment **Bpt**
- WHEN IM BORED AND NOTHING ELSE TO DO **Bpt**
- i love it
- keep me from being bored **Bpt**
- diversion **Bpt**
- To pass time or for refreshing brain
- when im bored **Bpt**
- make time go quicker **Bpt**
- Distraction from boring environments **Bpt**
- For enjoyment
- boredom **Bpt**
- passes the time whilst travelling to my destinations **Bpt**
- to fill in a quiet time **Bpt**
- Because it is the perfect resolution for my eyes and it is always with me
- Handy: I can play whenever I want
- fun
- use my brain
- enjoyment
- convenient
- good fun
- pass the time. **Bpt**
- to pass the time **Bpt**
- Something to do **Bpt**
- boredom
- its mobile
- not really
- compulsive
- to relieve boredom if i have to wait for something **Bpt**
- brain exercise
- to pass time **Bpt**
- passes the time while waiting for appointments **Bpt**
- fun
- helps me relax on the throne lol
- To pass the time usually
- takes my mind off reality

- I enjoy playing some games with family and friends- helps me feel close to them. Single player games help me to wind down or to pass time when I'm waiting. **Bpt**
- For a mind challenge and break from home duties
- boredom/pass time **Bpt**
- bored, something to do **Bpt**
- To keep me entertained.
- it makes you more competent
- boring **Bpt**
- Take a break from things I'm doing and fill in the spare time I have. **Bpt**
- When I am bored **Bpt**
- to pass time **Bpt**
- WHEN I ISH BORED ;) **Bpt**
- I play games on my phone because they are fun and enjoyable. It's also a great way to pass time if I'm waiting in line for something. **Bpt**
- There are multiple reasons, I cannot pick one.
- Fun
- Procrastination mainly and also to pass time. **Bpt**
- Candy crash
- mainly to pass time, especially when i am stuck somewhere waiting **Bpt**
- In it always with me
- To kill boredom **Bpt**
- for something to do and fill in time **Bpt**
- To pass the time, and it's a bit of a challenge
- I play it to get away from the real world and just to have fun.
- Because it is fun and time consuming. **Bpt**
- Because I enjoy playing games.
- For fun
- Something to do when I'm bored **Bpt**
- to alleviate boredom **Bpt**
- to kill time **Bpt**
- to fill in time **Bpt**
- boredom **Bpt**
- When I'm bored or waiting for something ie time waster **Bpt**
- Passes time and uses my brain **Bpt**
- to have fun
- To pass time or to distract myself **Bpt**
- Something to do, compete with the children! **Bpt**
- pass time **Bpt**
- it's convenient and usually I need something to distract me
- pass the time, need to be doing something all the time **Bpt**
- Cause I can
- When am bored **Bpt**
- keep my brain active
- It's fun & readily available.
- Just to pass time and also I love playing games
- something to do **Bpt**

- to pass time **Bpt**
- to pass time **Bpt**
- I play games that my friends are playing too and we try to beat each others scores and pass each other on different levels.
- to past the time **Bpt**
- To pass time **Bpt**
- To pass time while waiting **Bpt**
- Occupies time when i am waiting for things or late at night when there is nothing to **Bpt** do.
- Fun, addictive, mentally challenging, to pass the time **Bpt**
- When I have a few minutes to pass, for example waiting for an appointment or for the washing to finish, it distracts me **Bpt**
- Convenient & fun
- I love gaming and also continue a game I was playing, sometimes boredom
- enjoyment, passes time, stimulates my mind **Bpt**
- i like to play them
- Something to do when I'm bored! **Bpt**
- fun and challenge
- it passes the time and i like the interaction between friends **Bpt**
- convenient and can play outdoors
- fun
- its a break in my busy day. A little time to stop and just relax
- I have enjoyed meeting new people and have even met up with the in real life, the games gave us something in common.
- ts easy to keep up with my games when I am not at home.
- To pass the time when I am bored **Bpt**
- Easy access to game ie don't have to wait to power up desktop computer to play. The phone is handy!
- due to boredom **Bpt**
- I enjoy the opportunity to challenge my mind playing games with others & play games to better my own scores (competitive)
- it's fun and i can chat with my friends
- Because I can play it anywhere even in bed
- its portable
- to pass the time. I play if I am waiting to go to work, during breaks etc **Bpt**
- To fill in time, while waiting, or on break **Bpt**
- to fill in time, **Bpt**
- because I can
- if an add comes on tv and haven't got lap top or touch pad around and too lazy to go to sesk top might play a game , or if I am out an dcan get signal might play while waiting to pick up husband **Bpt**
- I only play games on my phone when I dont have my computer or I pad as it is just too small.
- At the time there is nothing else to do **Bpt**
- To pass the time and because I'm competitive **Bpt**
- entertainment
- i just like to play
- To pass times **Bpt**

- boredom **Bpt**
- when i get bored **Bpt**
- just love to do something, when free
- When I'm bored **Bpt**
- I play games when i am bored or when i am thinking and need to ease my mind **Bpt**
- convenient and something to do **Bpt**
- when im bored to pass time **Bpt**
- because they are good **Bpt**
- its fun
- kill boredom **Bpt**
- brain games
- to pass time and keep my mind bzy but refreshed **Bpt**
- fill in small amount of time,relax **Bpt**
- to pass the time **Bpt**
- I play games alot
- To while away the time while waiting for appointments etc **Bpt**
- Keep me occupied when I am waiting, take a quick break, re-focus **Bpt**
- passing time **Bpt**
- to pass time when nothing else to do **Bpt**
- to unwind
- Fill my time, escape from work **Bpt**
- Because I enjoy it and always try to beat my last score
- to relieve boredom **Bpt**
- To pass the time & keep busy **Bpt**
- I play games on my smart phone to distract my mind from work or something that worries me. I also play to fill in time and for fun. **Bpt**
- when I'm board or trying to pass the time **Bpt**
- Fun, challenging, enjoyable
- because my phone is always with me
- time filler in **Bpt**
- Something to do when i have forgotten to take a book with me to read or just to unwind for a moment **Bpt**
- gives me something to do when i have a spare couple of minutes **Bpt**
- BORED **Bpt**
- its always with me
- most of the time in the aftermoon and evening
- to keep my brain active
- I love doing puzzles, word games, etc. because they stimulate my brain. Also, it gives me something to do while waiting at appointments. **Bpt**
- To pass the time something other than watching tv **Bpt**
- To pass the time **Bpt**
- waiting in carpark for school to finish **Bpt**
- candy crush, solitaire, bejewelled,tetris,zombie crush, bubble burst,space invaders
- Fills in the time. Helps me destress.
- Fun. Passes time
- because when i'm studing i need a break

- it's right there in your when you are bored **Bpt**
- relaxing time waster, de-stress
- enjoyable way to pass time **Bpt**
- convenience. I can play anywhere.
- Pure enjoyment. It is nice to spend a small amount of time doing something far removed from my every day routine.
- to fill in time, to keep my mind alert **Bpt**
- To fill in time, ie. in a waiting area. **Bpt**
- it is convenient
- Usually to pass time when bored e.g. on bus on way to or from work **Bpt**
- something to do when not busy **Bpt**
- Easy to play in bed or sitting outside

## Appendix 1.2 When or where do you most often play games on your phone?

When or where do you most often play games on your phone? (optional)

Key: Home **Hm** Travelling **Tvg** Waiting **Wtg** Work/school/university **WSU**

- Home **Hm**
- while commuting in public transport **Tvg**
- home **Hm**
- laying in bed or waiting for the bus, train or plane **Hm Tvg Wtg**
- At uni, work **WSU**
- at home **Hm**
- home watching tv **Hm**
- school **WSU**
- living room, train, at University (RMIT also) while waiting for class to start **Hm Wtg Tvg**
- At home before sleeping **Hm**
- Mostly at home in the evening. Sometimes on public transport. **Hm Tvg**
- on the toilet
- Public transport and whilst waiting for friends/events **Tvg Wtg**
- bored or lonely
- wherever
- train **Tvg**
- at home **Hm**
- When travelling **Tvg**
- Home **Hm**
- Nowhere specific - lunch room, at home on the couch. **Hm WSU**
- lunch times at work or slower times **WSU**
- When I am waiting for something. **Wtg**
- at home **Hm**
- Home **Hm**
- transport to and from work **Tvg**
- before bed, when i wake up **Hm**
- mostly at home or in the car **Hm Tvg**
- Evening
- Public Transport **Tvg**
- home **Hm**
- at home **Hm**
- in my toilet **Hm**
- in bed **Hm**
- at home and at work **Hm**
- work
- Lunch break **WSU**
- in car **Tvg Wtg**

- At Home **Hm**
- on planes **Tvg**
- at home **Hm**
- Home, public transport **Hm Tvg**
- home **Hm**
- At home and on the train to and from work. During my lunch break **Hm Tvg**
- public transport
- i like to play games at home or at work. **Hm WSU**
- at home **Hm**
- While waiting for something (public transport, appointment, etc) **Tvg Wtg**
- Home **Hm**
- in bed awake at night when I should be sleeping but cant **Hm**
- home **Hm**
- Lounge room at home **Hm**
- fill in time at doctor's and other appointments **Wtg**
- mostly at home but i have waiting time in my job so it passes the time **Hm WSU**
- AT HOME **Hm**
- while waiting for others **Wtg**
- Waiting for the kids in the car at sport practice **Wtg**
- at home when nothing else to do **Hm**
- home **Hm**
- Public transport **Tvg**
- at home or just sitting around **Hm**
- home **Hm**
- home **Hm**
- At home when ever if I am free. **Hm**
- home, public transport, in the car on long trips.when not driving of course **Hm Tvg**
- at home **Hm**
- Whilst waiting to see doctors and specialists **Wtg**
- home /afternoons **Hm**
- Home **Hm**
- any slack time through the day
- @home **Hm**
- usually at home in the morning until I go out to gym or wherever,and again at home in the evening for an hour or so. **Hm**
- Mostly evenings relaxing in bed. **Hm**
- as above, when I feel like a challenge
- when im bored
- In waiting rooms, at home when nothing on tv, at other times & places times when bored. **Hm Wtg**
- In the toilet
- Home **Hm**
- Home **Hm**
- Waiting for busses **Tvg**
- home after work or weekends **Hm**
- at work **Hm**

- home **Hm**
- On the train home from work **Tvg**
- On the train on the way home from work each evening. **Tvg**
- Anywhere i can be waiting. Bus stop, car etc **Wtg**
- home before bed **Hm**
- home **Hm**
- waiting rooms **Wtg**
- HOME OR WHEN OUT WAITING **Wtg**
- home when i'm bored or on the toilet **Hm**
- home **Hm**
- public transport **Tvg**
- At home **Hm**
- at home **Hm**
- public transport **Tvg**
- Waiting areas (doctors, dentists, work meetings, car, etc) **Wtg**
- At home in the evening **Hm**
- at home **Hm**
- usually when I am driven to appointments **Tvg**
- home or at shopping centre when waiting for wife! **Hm Wtg**
- on public transport to and from work **Tvg**
- Public Transport and bed **Tvg Hm**
- on train **Tvg**
- at home **Hm**
- at home **Hm**
- at home or lunch time at work **Hm WSU**
- when i can
- Before going to sleep. **Hm**
- when waiting for someone **Wtg**
- medical appointments with the long wait in the waiting room **Wtg**
- at home **Hm**
- in bed **Hm**
- home **Hm**
- at home **Hm**
- at home or travelling by public transport **Hm Tvg**
- Toilet
- on the way to shopping **Tvg**
- hospital and doctors waiting rooms **Wtg**
- home **Hm**
- on the throne
- Public Transport or when waiting for someone/something **Tvg Wtg**
- home, evening **Hm**
- Home- when winding down. **Hm**
- At home **Hm**
- Whilst waiting for public transport **Tvg**
- public transport/waiting for something/ad break on tv **Tvg Wtg**
- anywhere



- Depends, I play games when im bored or just to kill time. Or just because i can. Usually at home, work, in the car, etc **Hm Tvg WSU**
- Every 30 mins while I'm studying and in the morning when I wake up. **Hm WSU**
- At home **Hm**
- when there is nothing else to do
- WHEN I ISH SAAHH BORED ;)
- At the Doctors, Restaurant, Public Transport and sometimes at home. **Hm Wtg**
- At home. **Hm**
- Home and in the car **Hm Tvg**
- At home. **Hm**
- At home in spare time **Hm**
- In the car **Tvg**
- At home **Hm**
- At home whenever I feel like it **Hm**
- at home throughout the day **Hm**
- At uni, or at home while watching TV **Hm WSU**
- Home, school and public transport. **Tvg**
- All day and everywhere i am.
- At home with my spare free time, which isn't alot. **Hm**
- At home when I'm bored **Hm**
- When I;m out and about and I have to wait for something. **Wtg**
- school **WSU**
- on the train **Tvg**
- at home **Hm**
- in car as a passenger **Tvg**
- home & waiting rooms **Hm Wtg**
- Public transport to and from work **Tvg**
- when im out
- Home or when I am waiting at the doctors etc **Hm Wtg**
- In bed or on the couch. **Hm**
- Bathroom, work, filling in time **Wtg WSU**
- infront of the TV **Hm**
- Home in bed **Hm**
- while waiting for the doctor or public transport etc... **Wtg**
- when waiting....drs rooms, picking kids up etc **Wtg**
- Mostly at home **Hm**
- when kids napping and at home **Hm**
- home **Hm**
- at appointments **Wtg**
- when sitting free at home or when waiting for someone or waiting for the train **Hm Wtg**
- I play games in the car waiting for family or friends, on public transport, at home when ever I bored. **Hm Tvg Wtg**
- car
- When using public transport...or waiting at appointments...or waiting for kids to finish extra curricular activities **Tvg Wtg**
- As a passanger or in the evenings when everything is quiet **Hm**

- at home **Hm**
- Home or on public transport **Hm Tvg**
- Home **Hm**
- home **Hm**
- work during the day when having a break or anytime i'm at home, mainly evenings **Hm WSU**
- at work **WSU**
- waiting around **Wtg**
- Mostly at night! **Hm**
- home with a coffee or wine **Hm**
- at home, in waiting rooms, if i am having coffee or lunch on my own **Hm Wtg**
- outdoors
- whenever I am waiting for something or someone **Wtg**
- When I travel by train **Tvg**
- At work in my breaks. **WSU**
- At home **Hm**
- Mainly at home. Sometimes at friends/relatives when discussing games...then we all have a try at each other's phone games. **Hm**
- in bed at night **Hm**
- whenever I have some spare time & I have the opportunity, its good when im **Wtg** waiting
- anytime and at home **Hm**
- before I go to sleep mostly **Hm**
- at home between ads **Hm**
- home **Hm**
- Waiting in the car or at work on break **Wtg**
- when waiting for appointments meetings etc **Wtg**
- home **Hm**
- home or waiting to pick family up **Hm Wtg**
- On the bus or train **Tvg**
- Waiting for appointment eg. Doctors etc **Wtg**
- At home and at work during breaks **Hm WSU**
- home **Hm**
- at home mostly but sometimes i play when we are out too **Hm**
- Home in the evening. **Hm**
- at home **Hm**
- at home **Hm**
- every now and then, whenever free
- University **WSU**
- home **Hm**
- in bed **Hm**
- home **Hm**
- waiting rooms
- when im bored at home **Hm**
- i dont know
- fruit ninja
- on the bus, train, in the car **Tvg**

- in toilet or before going to sleep **Hm**
- home after work **Hm**
- While rocking the baby to sleep **Hm**
- Everyday pretty much
- waiting in car to pick up kids from school **Wtg**
- When waiting for something or when I have a few minutes to kill **Wtg**
- waiting for something - appointments, pickups etc **Wtg**
- public transport **Tvg**
- when I have nothing else to do
- Home, car **Hm Tvg**
- at home **Hm**
- Public Transport **Tvg**
- In the evening at home **Hm**
- at home, waiting for a tv show to start, or waiting to pick the kids up from school **Hm**
- Home **Hm**
- Morning
- home, when children are in bed **Hm**
- At home **Hm**
- HOME **Hm**
- travelling **Tvg**
- at home **Hm**
- when I'm taking a break or waiting for someone/something **WSU Wtg**
- At home, Food Courts, Doctor's waiting rooms, in the car (as passenger). **Hm**
- At home **Hm**
- while waiting or bored **Wtg**
- school car park **Wtg**
- when ever
- While waiting in the car. **Wtg**
- In car waiting for children **Wtg**
- home **Hm**
- at home because there is nothing on tv and waiting in the car for school to come out **Wtg Hm**
- home **Hm**
- transport public **Tvg**
- Evening, night **Hm**
- Generally in the late afternoon before I start cooking dinner. **Hm**
- home **Hm**
- In a waiting room or at home. **Hm Wtg**
- Home and car **Hm Tvg**
- at home **Hm**
- Public transport **Tvg**
- mostly on transport **Tvg**
- In lounge room **Hm**
- Bed while watching TV or outside in the sun **H**



## **Appendix 1.3 Testing the Model**

As part of an ongoing research project to extend the research and test the conclusions of this thesis, data is being collected on an ongoing basis. Two games which can be identified as strategy games were selected to test the model. Clash of Clans, released in 2012, is one of the most successful mobile games, as previously established in this thesis. As of August 7<sup>th</sup> ThinkGaming (2014) estimated that Clash of Clans was the number one grossing game on Apple's iOS platform with daily revenues of \$1,250,000 and 45,000 daily downloads. Civilization 5 is a PC based strategy game, released in 2010 which according to Metacritic (2011) was one of the best reviewed games of the year, attaining good reviews from critics. Both games offer the opportunity to play single player or multiplayer modes.

### **Methodology**

Two surveys were created, each specific to the relevant game but otherwise identical. The surveys were hosted using qualtrics software. Most responses were collected through posting on the popular website Reddit.com which has specific forums (subreddits) relevant to each game. Further responses were collected through relevant gaming forums with the permission of forum moderators. Respondents over eighteen were invited to take a short survey as part of an ethically approved university research project. Data collection began on July 15<sup>th</sup> 2014 and is ongoing. By August 1<sup>st</sup> 2014, 856 responses had been collected for Clash of Clans with 845 deemed valid post data cleaning. There were 1562 responses for Civilization 5 with 1367 deemed valid post data cleaning.

### **Scales**

The PENS scales utilized in the survey reflected the original use of the PENS scales in their wording as per single games. The Need for Relatedness was altered as recommended in Chapter

5 of this thesis, see table 1 below. Reverse scored items can be problematic (Rodenbaugh, Woods & Heimberg 2007) and the previous analysis in this thesis reflected this with the reverse scored item in the Need for Relatedness being eliminated through the CFA and the reverse scored item of Enjoyment only having a factor loading of .591. The two reverse items used in the analysis were subsequently reworded and subsequently the factor loadings of each item plus the Cronbach's alpha of the constructs were improved in comparison to the original theorization in this thesis.

**Table 1 Scales**

Construct	Original Item	Adapted Item
The Need for Competence	I feel competent at the game	
	I feel very capable and effective when playing	
	My ability to play the game is well matched with the game's challenges	
The Need for Autonomy	The game provides me with interesting options and choices things	
	The game lets you do interesting	
	I experience a lot of freedom in the game	
The Need for Relatedness	I find the relationships I form in this game fulfilling	I find the relationships with others who play the game fulfilling
	I find the relationships I form in this game important	I find the relationships with others who play the game important
	I don't feel close to other players (R)	I feel close to other players who play the game
The experience of Flow	Do you think you have ever experienced flow in playing (Game X)?	
	In general, how frequently would you say you have experienced 'flow' when you play	
	Most of the time I play (Game X) I feel that I am in flow	
Mobile Escapism	I play (Game X) to escape from reality	
	I play (Game X) get away from what I am doing	
	I play the game so I can forget about work/study	
	I play the game because it helps me unwind	
Enjoyment	I enjoy playing (Game X)	
	Playing (Game X) is fun to do	
	Playing (Game X) is boring (R)	Playing (Game X) is not boring

## Exploratory Factor Analysis

Exploratory Factor Analysis was conducted to confirm the validity of the constructs. The EFA confirmed that the Needs for Competence and Autonomy represent separate constructs when examining individual games. One item did not load in terms of Civilization 5, and was subsequently dropped from the construct of Mobile Escapism for that analysis. Tables 2 and 3 show the outcomes of the EFA for Clash of Clans and Civilization 5. The reliability of the constructs is shown in Table 4.

**Table 2 EFA Clash of Clans**

	Rotated Component Matrix <sup>a</sup>					
	Component					
	1	2	3	4	5	6
Competence 1						.849
Competence 2						.867
Competence 3						.665
Autonomy 1					.813	
Autonomy 2					.830	
Autonomy 3					.753	
Relatedness 1			.866			
Relatedness 2			.893			
Relatedness 3			.862			
Mobile Escapism 1	.819					
Mobile Escapism 2	.886					
Mobile Escapism 3	.860					
Mobile Escapism 4	.552					
Flow 1		.819				
Flow 2		.909				
Flow 3		.883				
Enjoyment 1				.827		
Enjoyment 2				.852		
Enjoyment 3				.761		

**Table 3 EFA Civilization 5**

	Rotated Component Matrix <sup>a</sup>					
	Component					
	1	2	3	4	5	6
Competence 1					.873	
Competence 2					.875	
Competence 3					.770	
Autonomy 1						.804
Autonomy 2						.856
Autonomy 3						.763
Relatedness 1			.839			
Relatedness 2			.903			
Relatedness 3			.871			
Mobile Escapism 1	.866					
Mobile Escapism 2	.914					
Mobile Escapism 3	.861					
Mobile Escapism 4						
Flow 1		.855				
Flow 2		.923				
Flow 3		.899				
Enjoyment 1				.811		
Enjoyment 2				.818		
Enjoyment 3				.755		

**Table 4 Reliability of Scales**

Construct Cronbach's A	Clash of Clans	Civilization 5
The Need for Competence	.716	.810
The Need for Autonomy	.814	.787
The Need for Relatedness	.894	.864
The experience of Flow	.896	.898
Mobile Escapism/ Escapism	.826	.870
Enjoyment	.822	.777

**Regression Analysis**

## Clash of Clans

The Needs for Competence, Autonomy and Relatedness, The experience of Flow and Mobile Escapism were used in a standard multiple regression to predict Enjoyment. The ANOVA



demonstrated that the model as a whole was a significant fit to the data. An examination of the correlations table demonstrates that there are no highly significant correlations between the independent variables and dependent variable indicating there are no multicollinearity issues with the model. The prediction model was statistically significant,  $F(5, 839) = 76.229, p < .001$ , and accounted for approximately 31% of the variance of enjoyment ( $R^2 = .312$ , Adjusted  $R^2 = .308$ ).

**Table 5 Regression Clash of Clans**

N= 845	Enjoyment	Competence	Autonomy	Relatedness	Flow	Escapism	$\beta$	T	Sig
Enjoyment	.								
Competence	.364*	.					.178	5.703	.000
Autonomy	.487*	.377*	.				.254	10.574	.000
Relatedness	.311*	.270*	.367*	.			.044	2.625	.009
Flow	.296*	.225*	.259*	.299*	.		.055	3.092	.002
Escapism	.230*	.086*	.164*	.216*	.398*	.	.057	3.152	.002
Mean	6.1582	5.7531	4.9882	4.6024	3.7519	3.8683			
SD	.9282	.9354	1.2610	1.7681	1.7067	1.6025			

\* $p < .05$

#### Civilization 5

The Needs for Competence, Autonomy and Relatedness, The experience of Flow and Escapism were used in a standard multiple regression to predict Enjoyment. The ANOVA demonstrated that the model as a whole was a significant fit to the data. An examination of the correlations table demonstrates that there are no highly significant correlations between the independent variables and dependent variable indicating there are no multicollinearity issues with the model. The prediction model was statistically significant,  $F(5, 1361) = 88.317, p < .001$ , and accounted for approximately 24% of the variance of enjoyment ( $R^2 = .245$ , Adjusted  $R^2 = .241$ ).

**Table 6 Civilisation**

N= 1367	Enjoyment	Competence	Autonomy	Relatedness	Flow	Escapism	$\beta$	T	Sig
Enjoyment									
Competence	.177*						.089	4.513	.000
Autonomy	.455*	.087*					.336	16.837	.000
Relatedness	.206*	.202*	.203*				.043	3.322	.001
Flow	.212*	.209*	.205*	.226*			.041	3.041	.002
Escapism	.086*	-.034	.042	.010	.165*		.027	2.464	.014
Mean	6.2370	5.2012	5.7154	3.9810	4.5889	3.8344			
SD	.80631	.99613	.98734	1.55856	1.50138	1.76848			

\* $p < .05$

## Discussion & Conclusions

For both games the Needs for Competence, Autonomy and Relatedness, the experience of Flow and Escapism go some way towards explaining enjoyment. In the case of the mobile game, Clash of Clans the model explains 31% of enjoyment while for Civilization 5, only 24% of enjoyment is explained. Nonetheless, these outcomes validate the model as representing the concept of play. The key difference between the simpler mobile game, Clash of Clans and the more complex PC based Civilization 5 can be seen through the influence of the Need for Autonomy which can be satisfied much more by the array of options available to a player on PC.

## Appendix 1.4 Regression Analysis Output

### Main Model Regressions

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	Descriptive Statistics		
	Mean	Std. Deviation	N
Enjoyment1	5.4353	.88991	340
CompAuto1	5.0676	.94089	340
Rel2	3.4000	1.44781	340
Flow1	3.2118	1.59551	340
MobileEscapism1	4.5522	1.08031	340
SocialArousal1	2.9814	1.08948	340
Competition1	2.9949	1.36599	340
PSPLIT	1.9971	.83259	340
Generations	2.0735	.82219	340
Gender	1.50	.501	340

---

		Correlations			
		Enjoyment1	CompAuto1	Rel2	Flow1
Pearson Correlation	Enjoyment1	1.000	.544	.298	.315
	CompAuto1	.544	1.000	.459	.470
	Rel2	.298	.459	1.000	.453
	Flow1	.315	.470	.453	1.000
	MobileEscapism1	.288	.398	.305	.346
	SocialArousal1	.029	.270	.520	.486
	Competition1	.106	.335	.461	.524
	PSPLIT	.166	.330	.278	.294
	Generations	-.036	-.247	-.130	-.261
Gender	.093	-.016	.046	-.005	
Sig. (1-tailed)	Enjoyment1	.	.000	.000	.000
	CompAuto1	.000	.	.000	.000
	Rel2	.000	.000	.	.000
	Flow1	.000	.000	.000	.
	MobileEscapism1	.000	.000	.000	.000
	SocialArousal1	.298	.000	.000	.000
	Competition1	.025	.000	.000	.000
	PSPLIT	.001	.000	.000	.000
	Generations	.255	.000	.008	.000
Gender	.043	.382	.197	.461	
N	Enjoyment1	340	340	340	340
	CompAuto1	340	340	340	340
	Rel2	340	340	340	340
	Flow1	340	340	340	340
	MobileEscapism1	340	340	340	340
	SocialArousal1	340	340	340	340
	Competition1	340	340	340	340
	PSPLIT	340	340	340	340
	Generations	340	340	340	340
Gender	340	340	340	340	

		Correlations			
		Mobile Escapism1	Social Arousal1	Competition 1	PSPLIT
Pearson Correlation	Enjoyment1	.288	.029	.106	.166
	CompAuto1	.398	.270	.335	.330
	Rel2	.305	.520	.461	.278
	Flow1	.346	.486	.524	.294
	MobileEscapism1	1.000	.489	.303	.226
	SocialArousal1	.489	1.000	.581	.177
	Competition1	.303	.581	1.000	.222
	PSPLIT	.226	.177	.222	1.000
	Generations	-.133	-.101	-.258	-.064
Sig. (1-tailed)	Gender	.099	-.011	-.133	-.025
	Enjoyment1	.000	.298	.025	.001
	CompAuto1	.000	.000	.000	.000
	Rel2	.000	.000	.000	.000
	Flow1	.000	.000	.000	.000
	MobileEscapism1	.	.000	.000	.000
	SocialArousal1	.000	.	.000	.001
	Competition1	.000	.000	.	.000
	PSPLIT	.000	.001	.000	.
N	Generations	.007	.031	.000	.118
	Gender	.034	.421	.007	.324
	Enjoyment1	340	340	340	340
	CompAuto1	340	340	340	340
	Rel2	340	340	340	340
	Flow1	340	340	340	340
	MobileEscapism1	340	340	340	340
	SocialArousal1	340	340	340	340
	Competition1	340	340	340	340
PSPLIT	340	340	340	340	
Generations	340	340	340	340	
Gender	340	340	340	340	

Correlations			
		Generations	Gender
Pearson Correlation	Enjoyment1	-.036	.093
	CompAuto1	-.247	-.016
	Rel2	-.130	.046
	Flow1	-.261	-.005
	MobileEscapism1	-.133	.099
	SocialArousal1	-.101	-.011
	Competition1	-.258	-.133
	PSPLIT	-.064	-.025
	Generations	1.000	-.068
	Gender	-.068	1.000
Sig. (1-tailed)	Enjoyment1	.255	.043
	CompAuto1	.000	.382
	Rel2	.008	.197
	Flow1	.000	.461
	MobileEscapism1	.007	.034
	SocialArousal1	.031	.421
	Competition1	.000	.007
	PSPLIT	.118	.324
	Generations	.	.107
	Gender	.107	.
N	Enjoyment1	340	340
	CompAuto1	340	340
	Rel2	340	340
	Flow1	340	340
	MobileEscapism1	340	340
	SocialArousal1	340	340
	Competition1	340	340
	PSPLIT	340	340
	Generations	340	340
	Gender	340	340

---

Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	Gender, Flow1, Generations, PSPLIT, MobileEscapism1, Rel2, CompAuto1, Competition1, SocialArousal1 <sup>b</sup>	.	Enter

a. Dependent Variable: Enjoyment1

b. All requested variables entered.

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Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.623 <sup>a</sup>	.388	.371	.70581	.388	23.211	9

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Model Summary

Model	df2	Change Statistics
		Sig. F Change
1	330	.000

a. Predictors: (Constant), Gender, Flow1, Generations, PSPLIT, MobileEscapism1, Rel2, CompAuto1, Competition1, SocialArousal1

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ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	104.068	9	11.563	23.211	.000 <sup>b</sup>
	Residual	164.397	330	.498		
1	Total	268.465	339			

a. Dependent Variable: Enjoyment1

b. Predictors: (Constant), Gender, Flow1, Generations, PSPLIT, MobileEscapism1, Rel2, CompAuto1, Competition1, SocialArousal1

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Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	2.334	.310		7.522	.000
	CompAuto1	.437	.052	.462	8.360	.000
	Rel2	.093	.035	.152	2.691	.007
	Flow1	.104	.032	.187	3.268	.001
	MobileEscapism1	.145	.044	.176	3.333	.001
	SocialArousal1	-.252	.051	-.309	-4.921	.000
	Competition1	-.023	.038	-.035	-.589	.556
	PSPLIT	-.054	.050	-.051	-1.079	.281
	Generations	.143	.050	.132	2.861	.004
	Gender	.137	.079	.077	1.730	.085

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Coefficients <sup>a</sup>			
Model		Tolerance	Collinearity Statistics VIF
1	(Constant)		
	CompAuto1	.608	1.646
	Rel2	.583	1.715
	Flow1	.568	1.761
	MobileEscapism1	.663	1.509
	SocialArousal1	.471	2.122
	Competition1	.532	1.879
	PSPLIT	.846	1.182
	Generations	.870	1.149
	Gender	.936	1.068

a. Dependent Variable: Enjoyment1

Collinearity Diagnostics <sup>a</sup>							
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	CompAuto1	Rel2	Flow1
1	1	9.148	1.000	.00	.00	.00	.00
	2	.285	5.662	.00	.00	.02	.08
	3	.128	8.450	.00	.00	.01	.01
	4	.122	8.657	.00	.00	.00	.01
	5	.092	9.963	.00	.00	.36	.65
	6	.084	10.442	.00	.00	.45	.18
	7	.058	12.609	.00	.00	.04	.01
	8	.049	13.655	.03	.13	.01	.02
	9	.023	20.008	.09	.18	.05	.01
	10	.010	29.631	.87	.68	.07	.04



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Collinearity Diagnostics<sup>a</sup>

Model	Dimension	Variance Proportions					
		Mobile-Escapism1	Social-Arousal1	Competition1	PSPLIT	Generations	Gender
1	1	.00	.00	.00	.00	.00	.00
	2	.00	.01	.05	.00	.16	.03
	3	.00	.05	.06	.66	.09	.00
	4	.00	.00	.03	.13	.24	.43
	5	.00	.01	.01	.03	.06	.00
	6	.01	.01	.36	.02	.05	.01
	7	.15	.36	.41	.00	.06	.11
	8	.09	.26	.00	.15	.06	.27
	9	.75	.29	.07	.00	.08	.02
	10	.00	.02	.02	.00	.20	.13

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a. Dependent Variable: Enjoyment1

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## Moderation Regressions

### Gender Moderation Regressions

#### The Need for Competence & Autonomy

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.553 <sup>a</sup>	.306	.302	.74342	.306	74.382	2	337	.000
2	.555 <sup>b</sup>	.308	.302	.74367	.002	.771	1	336	.380

a. Predictors: (Constant), CompA1, Gdummy

b. Predictors: (Constant), CompA1, Gdummy, GCA

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82.217	2	41.108	74.382	.000 <sup>b</sup>
	Residual	186.249	337	.553		
	Total	268.465	339			
2	Regression	82.643	3	27.548	49.811	.000 <sup>c</sup>
	Residual	185.822	336	.553		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), CompA1, Gdummy

c. Predictors: (Constant), CompA1, Gdummy, GCA

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.730	.225		12.111	.000
	Gdummy	.182	.081	.102	2.253	.025
	CompA1	.516	.043	.546	12.022	.000
2	(Constant)	2.534	.318		7.975	.000
	Gdummy	.182	.081	.102	2.252	.025
	CompA1	.555	.061	.586	9.019	.000
	GCA	-.075	.086	-.057	-.878	.380

a. Dependent Variable: Enjoy1

## The Need for Relatedness

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.280 <sup>a</sup>	.078	.073	.85695	.078	14.287	2	337	.000
2	.285 <sup>b</sup>	.081	.073	.85678	.003	1.138	1	336	.287

a. Predictors: (Constant), Relatedness1, Gdummy

b. Predictors: (Constant), Relatedness1, Gdummy, GRel

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.984	2	10.492	14.287	.000 <sup>b</sup>
	Residual	247.481	337	.734		
	Total	268.465	339			
2	Regression	21.819	3	7.273	9.908	.000 <sup>c</sup>
	Residual	246.646	336	.734		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), Relatedness1, Gdummy

c. Predictors: (Constant), Relatedness1, Gdummy, GRel

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.713	.143		32.979	.000
	Gdummy	.133	.093	.075	1.431	.153
	Relatedness1	.195	.039	.264	5.039	.000
2	(Constant)	4.832	.181		26.654	.000
	Gdummy	.135	.093	.076	1.451	.148
	Relatedness1	.159	.052	.215	3.082	.002
	GRel	.062	.058	.074	1.067	.287

a. Dependent Variable: Enjoy1

## The experience of Flow

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.329 <sup>a</sup>	.108	.103	.84275	.108	20.498	2	337	.000
2	.330 <sup>b</sup>	.109	.101	.84387	.000	.110	1	336	.741

a. Predictors: (Constant), Flow1, Gdummy

b. Predictors: (Constant), Flow1, Gdummy, GFlow

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.117	2	14.558	20.498	.000 <sup>b</sup>
	Residual	239.348	337	.710		
	Total	268.465	339			
2	Regression	29.195	3	9.732	13.666	.000 <sup>c</sup>
	Residual	239.270	336	.712		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), Flow1, Gdummy

c. Predictors: (Constant), Flow1, Gdummy, GFlow

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.786	.113		42.485	.000
	Gdummy	.169	.091	.095	1.848	.065
	Flow1	.176	.029	.316	6.140	.000
2	(Constant)	4.752	.153		31.125	.000
	Gdummy	.169	.092	.095	1.846	.066
	Flow1	.187	.043	.335	4.346	.000
	GFlow	-.019	.058	-.026	-.331	.741

a. Dependent Variable: Enjoy1

## Mobile Escapism

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.295 <sup>a</sup>	.087	.082	.85275	.087	16.093	2	337	.000
2	.303 <sup>b</sup>	.092	.084	.85175	.005	1.791	1	336	.182

a. Predictors: (Constant), MobileEscapism1, Gdummy

b. Predictors: (Constant), MobileEscapism1, Gdummy, Gesc

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.404	2	11.702	16.093	.000 <sup>b</sup>
	Residual	245.061	337	.727		
	Total	268.465	339			
2	Regression	24.704	3	8.235	11.351	.000 <sup>c</sup>
	Residual	243.761	336	.725		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), MobileEscapism1, Gdummy

c. Predictors: (Constant), MobileEscapism1, Gdummy, Gesc

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.322	.202		21.359	.000
	Gdummy	.116	.093	.065	1.251	.212
	MobileEscapism1	.232	.043	.282	5.382	.000
2	(Constant)	4.065	.279		14.577	.000
	Gdummy	.116	.093	.065	1.253	.211
	MobileEscapism1	.290	.061	.352	4.751	.000
	Gesc	-.115	.086	-.099	-1.338	.182

a. Dependent Variable: Enjoy1

## Age Moderation Regressions

### The Need for Competence & Autonomy

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.551 <sup>a</sup>	.304	.300	.74479	.304	73.485	2	337	.000
2	.552 <sup>b</sup>	.304	.298	.74547	.001	.388	1	336	.534

a. Predictors: (Constant), CompAuto, age

b. Predictors: (Constant), CompAuto, age, AgeCA

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.527	2	40.763	73.485	.000 <sup>b</sup>
	Residual	186.939	337	.555		
	Total	268.465	339			
2	Regression	81.742	3	27.247	49.031	.000 <sup>c</sup>
	Residual	186.723	336	.556		
	Total	268.465	339			

a. Dependent Variable: Enjoyment1

b. Predictors: (Constant), CompAuto, age

c. Predictors: (Constant), CompAuto, age, AgeCA

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.483	.284		8.756	.000
	age	.006	.003	.092	1.953	.052
	CompA1	.537	.045	.568	12.061	.000
2	(Constant)	2.456	.287		8.550	.000
	age	.006	.003	.090	1.898	.059
	CompA1	.542	.045	.573	11.956	.000
	AgeCA	-.002	.003	-.029	-.623	.534

a. Dependent Variable: Enjoy1

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## The Need for Relatedness

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.271 <sup>a</sup>	.073	.068	.85913	.073	13.363	2	337	.000
2	.279 <sup>b</sup>	.078	.070	.85842	.004	1.551	1	336	.214

a. Predictors: (Constant), Relatedness, age

b. Predictors: (Constant), Relatedness, age, AgeRel

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19.727	2	9.863	13.363	.000 <sup>b</sup>
	Residual	248.739	337	.738		
	Total	268.465	339			
2	Regression	20.870	3	6.957	9.440	.000 <sup>c</sup>
	Residual	247.596	336	.737		
	Total	268.465	339			

a. Dependent Variable: Enjoyment

b. Predictors: (Constant), Relatedness, age

c. Predictors: (Constant), Relatedness, age, AgeRel

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.850	.200		24.223	.000
	age	-.002	.003	-.030	-.577	.564
	Relatedness1	.197	.039	.267	5.060	.000
2	(Constant)	4.840	.200		24.172	.000
	age	-.002	.003	-.026	-.493	.622
	Relatedness1	.199	.039	.270	5.122	.000
	AgeRel	.003	.002	.065	1.245	.214

## The experience of Flow

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.317 <sup>a</sup>	.100	.095	.84653	.100	18.815	2	337	.000
2	.325 <sup>b</sup>	.106	.098	.84528	.005	2.001	1	336	.158

a. Predictors: (Constant), Flow, age

b. Predictors: (Constant), Flow, age, AgeFlow

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.967	2	13.483	18.815	.000 <sup>b</sup>
	Residual	241.499	337	.717		
	Total	268.465	339			
2	Regression	28.396	3	9.465	13.248	.000 <sup>c</sup>
	Residual	240.069	336	.714		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), age, Flow1

c. Predictors: (Constant), age, Flow1, AgeFlow

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.770	.192		24.892	.000
	age	.002	.003	.033	.620	.536
	Flow1	.181	.030	.324	6.039	.000
2	(Constant)	4.787	.192		24.969	.000
	age	.001	.003	.022	.403	.688
	Flow1	.179	.030	.320	5.963	.000
	AgeFlow	-.003	.002	-.074	-1.414	.158

a. Dependent Variable: Enjoy1



## Mobile Escapism

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.288 <sup>a</sup>	.083	.077	.85473	.083	15.239	2	337	.000
2	.303 <sup>b</sup>	.092	.083	.85199	.009	3.173	1	336	.076

a. Predictors: (Constant), MobileEscapism, age

b. Predictors: (Constant), MobileEscapism, age, AgeEscapism

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.266	2	11.133	15.239	.000 <sup>b</sup>
	Residual	246.199	337	.731		
	Total	268.465	339			
2	Regression	24.569	3	8.190	11.282	.000 <sup>c</sup>
	Residual	243.896	336	.726		
	Total	268.465	339			

a. Dependent Variable: Enjoyment

b. Predictors: (Constant), MobileEscapism, age

c. Predictors: (Constant), MobileEscapism, age, AgeEscapism

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.358	.264		16.492	.000
	age	-5.001E-5	.003	-.001	-.015	.988
	MobileEscapism1	.237	.044	.288	5.417	.000
2	(Constant)	4.378	.264		16.607	.000
	age	-.001	.003	-.019	-.348	.728
	MobileEscapism1	.239	.044	.290	5.481	.000
	AgeEscapism	-.005	.003	-.094	-1.781	.076

a. Dependent Variable: Enjoy1

## Playfulness Moderation Regressions

### The Need for Competence & Autonomy

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.544 <sup>a</sup>	.296	.292	.74878	.296	70.917	2	337	.000
2	.545 <sup>b</sup>	.297	.291	.74939	.001	.449	1	336	.503

a. Predictors: (Constant), Playfulness, CompAuto

c. Predictors: (Constant), Playfulness, CompAuto, CAPlay

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.521	2	39.761	70.917	.000 <sup>b</sup>
	Residual	188.944	337	.561		
	Total	268.465	339			
2	Regression	79.774	3	26.591	47.351	.000 <sup>c</sup>
	Residual	188.692	336	.562		
	Total	268.465	339			

a. Dependent Variable: Enjoyment1

b. Predictors: (Constant), Playfulness, CompAuto

c. Predictors: (Constant), Playfulness, CompAuto, CAPlay

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.889	.262		11.034	.000
	Pfns1	-.016	.036	-.022	-.443	.658
	CompA1	.522	.046	.552	11.240	.000
2	(Constant)	2.902	.263		11.045	.000
	Pfns1	-.015	.036	-.021	-.425	.671
	CompA1	.517	.047	.546	10.975	.000
	CAPlay	.022	.033	.031	.670	.503

a. Dependent Variable: Enjoy1

## The Need for Relatedness

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.292 <sup>a</sup>	.085	.080	.85356	.085	15.741	2	337	.000
2	.293 <sup>b</sup>	.086	.078	.85469	.000	.111	1	336	.739

a. Predictors: (Constant), Relatedness, Playfulness

b. Predictors: (Constant), Relatedness, Playfulness, REIPlay

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22.937	2	11.469	15.741	.000 <sup>b</sup>
	Residual	245.528	337	.729		
	Total	268.465	339			
2	Regression	23.018	3	7.673	10.503	.000 <sup>c</sup>
	Residual	245.447	336	.730		
	Total	268.465	339			

a. Dependent Variable: Enjoyment1

b. Predictors: (Constant), Relatedness, Playfulness

c. Predictors: (Constant), Relatedness, Playfulness, REIPlay

•

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.307	.252		17.116	.000
	Pfns1	.086	.039	.118	2.178	.030
	Relatedness1	.176	.040	.239	4.423	.000
2	(Constant)	4.308	.252		17.096	.000
	Pfns1	.086	.039	.118	2.187	.029
	Relatedness1	.174	.041	.235	4.268	.000
	REIPlay	.009	.026	.018	.333	.739

a. Dependent Variable: Enjoy1

•

## The experience of Flow

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.327 <sup>a</sup>	.107	.102	.84334	.107	20.233	2	337	.000
2	.332 <sup>b</sup>	.110	.102	.84308	.003	1.212	1	336	.272

a. Predictors: (Constant), Flow1, Pfns1

b. Predictors: (Constant), Flow1, Pfns1, FlowPlay

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.781	2	14.390	20.233	.000 <sup>b</sup>
	Residual	239.685	337	.711		
	Total	268.465	339			
2	Regression	29.642	3	9.881	13.901	.000 <sup>c</sup>
	Residual	238.823	336	.711		
	Total	268.465	339			

a. Dependent Variable: Enjoy1

b. Predictors: (Constant), Flow1, Pfns1

c. Predictors: (Constant), Flow1, Pfns1, FlowPlay

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	4.499	.240		18.757	.000			
	Pfns1	.067	.039	.093	1.714	.087	.180	.093	.088
	Flow1	.160	.030	.287	5.316	.000	.315	.278	.274
2	(Constant)	4.508	.240		18.790	.000			
	Pfns1	.068	.039	.093	1.718	.087	.180	.093	.088
	Flow1	.152	.031	.273	4.928	.000	.315	.260	.254
	FlowPlay	.025	.023	.058	1.101	.272	.130	.060	.057

a. Dependent Variable: Enjoy1

## Mobile Escapism

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.309 <sup>a</sup>	.095	.090	.84899	.095	17.732	2	337	.000
2	.318 <sup>b</sup>	.101	.093	.84745	.006	2.227	1	336	.137

a. Predictors: (Constant), MobileEscapism, Playfulness

b. Predictors: (Constant), MobileEscapism, Playfulness, MEPlay

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	25.562	2	12.781	17.732	.000 <sup>b</sup>
	Residual	242.904	337	.721		
	Total	268.465	339			
2	Regression	27.161	3	9.054	12.607	.000 <sup>c</sup>
	Residual	241.304	336	.718		
	Total	268.465	339			

a. Dependent Variable: Enjoyment

b. Predictors: (Constant), MobileEscapism, Playfulness

c. Predictors: (Constant), MobileEscapism, Playfulness, MEPlay

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.942	.278		14.187	.000
	Pfns1	.083	.039	.115	2.138	.033
	MobileEscapism1	.213	.044	.259	4.839	.000
2	(Constant)	3.921	.278		14.116	.000
	Pfns1	.090	.039	.124	2.299	.022
	MobileEscapism1	.206	.044	.250	4.636	.000
	MEPlay	.047	.031	.078	1.492	.137

a. Dependent Variable: Enjoy1



## Appendix 1.5 The Evolution of Mobile Games (ESA 2013)

The mobile games sector, a relatively new outgrowth of the entertainment software industry, makes an important contribution to overall computer and video game sales. Thanks to the popularity of smartphones, mobile games have received a burst of attention, driven by strong consumer demand, focused on producing innovative new technologies and creative new products. In fact, PricewaterhouseCoopers estimates that the global wireless games market will reach \$14.4 billion by 2017.

The mobile game genre essentially began in the early 1990s when calculator producers, such as Texas Instruments, began to embed the now ubiquitous *Snake* game in their devices. The pixelated reptile that grew in size while gliding through a tiny maze so captivated users that Nokia decided in 1997 to become the first mobile phone provider to include a game in one of its models. In the years since, an estimated 350 million mobile phones have offered *Snake* as a standard feature.

With *Snake*'s popularity as inspiration, several companies began to work on technology, informally known as WAP, which would enable mobile phones to transfer game-related data via a remote server. While the early results proved too primitive to attract many adapters, gamers and developers alike began to understand the possibilities for fast action and multiplayer mobile-based games.

The new millennium ushered in to the mobile games sector an abundance of grand ideas, funding – thanks to eager venture capitalists – and new publishers and developers. With many mobile phones featuring color screens for the first time, the enthusiasm was not unfounded. In addition, select phones began to support a version of the popular Java programming language. Together, these developments served to greatly expedite mobile games' sophistication.

Mobile games had reached a stage in development where major game publishers needed to decide how to incorporate the new platform into their business plans; the sector no longer would be the domain of small, independent game companies alone. While a few companies launched a mobile games division, most publishers simply opted to license out their most successful titles. The focus, therefore, remained on adapting old titles rather than on creating new games.

The introduction of Apple's iPhone in 2007 changed the playing field in a significant, exciting way. The iPhone created a "wide-open" market for third-party titles, where the barrier to entry for developers is low and games cost relatively little money for consumers. The App Store revolutionized the sector by establishing an easily-accessed direct connection between developers and consumers that bypasses publishers and phone operators.

Consumers have taken full advantage of the new access, downloading more than 50 billion apps since the App Store's launch in 2008. According to Apple, the App Store now offers more than 900,000 apps from developers that participate in the iPhone Developer Program. While mobile games represent only a portion of the apps downloaded, the extent to which Apple's new technology has galvanized the sector is unmistakable. Every type of gamer, from the most devoted to the most casual, regularly has new entertainment options available at his or her fingertips.

Similarly, thousands of developers create a variety of apps for Android, a mobile operating system launched by the Open Handset Alliance. Google's Android Market enables users to access the more than 500,000 apps available for the system. In addition, Amazon developed and launched its own Appstore in 2011 for the Android operating system, which currently offers 75,000 apps. The Android Market and Amazon Appstore network of developers includes well-



known entertainment software companies such as Electronic Arts, Namco Bandai America and Konami Digital Entertainment.

Other game developers have exhibited similar enthusiasm, primarily in their quest to push the envelope further by bringing popular console game trends, such as microtransactions and in-game advertising, to mobile phones. For example, downloadable content, perhaps the most lucrative microtransaction, empowers developers to tempt gamers with new additions, such as levels and missions, to their favorite games. Microsoft Corporation, for example, released two additional episodes, available digitally for *Grand Theft Auto 4*. Gamers may also download some full games from the Internet, including titles such as Take Two Interactive's *Civilization V* and Electronic Arts' *Harry Potter and the Deathly Hallows – Part 1*. In fact, purchases of digital game content accounted for 40 percent of all game content sales in 2012, and generated \$5.92 billion in revenue. This included purchases of digital full games, digital add-on content, mobile apps, subscriptions and social network gaming.

According to the UN International Telecommunications Union, there are currently 6.8 billion mobile phone subscriptions in the world – almost as many subscriptions as there are people – compared to one billion subscriptions in 2002. The mobile games sector owes its bright future to the strong technology habits that these people, particularly the teenagers among them, have developed.

According to the Entertainment Software Association's *2013 Essential Facts about the Computer and Video Game Industry*, 36 percent of gamers play games on their smartphone, and 25 percent play on their wireless device. The Pew Internet and American Life Project, meanwhile, found that 46 percent of U.S. teens play games on a cell phone or PDA. Combined

with 71 percent of teens ages 12-14 playing games on a portable gaming device, the mobile games sector looks likely to enjoy a large consumer base in the coming years.

Mobile game publishers, which now include a variety of organizations and companies from other industries, already have demonstrated an eagerness to embrace a wider audience and explore the potential that mobile games offer. The U.S. State Department, for example, invested \$415,000 in *X-Life*, a mobile game for Middle Easterners designed to teach them about the English language and American history and culture. The State Department hopes that “e-diplomacy might spread cross-cultural understanding between the U.S. and countries in the Middle East and Persian Gulf.” In addition, PBS Kids offers several mobile games for young children, including *Super Why!*, a series of mini literacy games based on PBS’ popular TV program by the same name, and *Corporal Cup’s Food Camp*, which educates players about how to prepare nutritious snacks and the importance of a balanced diet.

Even major companies such as Disney, Viacom, USA Network, and Marvel Entertainment have launched mobile games in an effort to engage their respective target audiences. Disney Interactive Studios developed a collection of mobile games based on popular Disney movies such as “Finding Nemo” and “Tron: Legacy,” while Marvel Entertainment launched *Captain America: Sentinel of Liberty* to celebrate the 2011 release of the “Captain America: The First Avenger” film.

The enterprising business model that now characterizes the mobile games sector has set the stage for additional innovations in the years to come. Analysts anticipate that the next generation of mobile games likely will include more multiplayer titles, in-game advertising, and downloadable content. With major game publishers once again rethinking their relationships with the sector,

mobile games will play no small role in the computer and video game industry's continued evolution.

6.8 billion - The number of global mobile subscriptions in 2013, compared with one billion in

2002.350 million - The estimated number of mobile phones that have offered the first mobile

phone game, *Snake*, as a standard feature.\$14.74 billion - The estimated size of the mobile games

market in 2017, according to PricewaterhouseCoopers.

## Appendix 1.6 Screening Question

Which of the following best describes your mobile phone?

- Smartphone, i.e., a phone with advanced computing capabilities that can run applications or “apps” and uses an operating system such as iOS (iPhone), Android (Google), Blackberry OS, Windows Mobile, Symbian, Palm / HP OS, or similar.}
- Basic cell phone, also known as a “feature phone”, i.e., a phone that cannot run “apps”, but may have a built-in camera, messaging services, calendars, etc
- None of these

Which of the following activities do you do on your smartphone? Tick all that apply

- Online Banking
- Surfing the Internet
- Listening to Music
- Playing Games
- Skype
- Checking the Weather
- Watching Videos
- Facebook
- Twitter
- Other Social Media
- Health Applications
- Taking Photos

## Appendix 1.7 Ethical Disclaimer

### PARTICIPANT INFORMATION

**Project Title:** Motivations to play smartphone games

You are invited to participate in a research project being conducted by RMIT University as part of a PhD thesis. Please read this carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please contact Dr. Foula Kopanidis. (foula.kopanidis@rmit.edu.au) This project has been approved by the RMIT Human Research Ethics Committee.

The following questionnaire will require approximately 15 minutes to complete. We are investigating what motivates people to play video games on their smartphone. The questionnaire will mainly concern your smartphone games experiences and will also ask you to rate aspects of your personality. The information gained from this survey will be anonymous and there are no perceived risks associated with answering.

The data will be used as part of a PhD thesis and as part of any subsequent publications such as in academic journals and conferences. The research data will be kept securely at RMIT for 5 years after publication, before being destroyed.

Because of the nature of data collection, we are not obtaining written informed consent from you. Instead, we assume that you have given consent by your completion of the survey.

You the participant have the following rights;

- The right to withdraw from participation at any time
- The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that so doing does not increase the risk for the participant.

- The right to have any questions answered at any time.

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user's transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

If you have any complaints about your participation in this project please see the complaints procedure on the [Complaints with respect to participation in research at RMIT](#) page

## **Appendix 1.8 Review of alternate media models in full**

The following theories are well established in the literature and are examined in more extended detail for their suitability in examining play on smartphones.

### **Action Theories; Theory of Planned Behaviour and Technology Acceptance Model**

The Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) have both received attention in the literature. Both models are adaptations of the Theory of Reasoned Action (TRA Fishbein and Ajzen 1975), which suggests that a person's behavioral intention depends on the person's attitude towards the behaviour in question and subjective norms, the perceptions of others. TAM is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (Venkatesh & Davies 2000). Chutter (2009) concluded that research in TAM lacked sufficient rigor and relevance to make it a relevant theory for Information Systems (IS) research while Bagozzi (2007) found that the TAM model was not suitable to explain or predict system use. Davis' (1985) model of TAM was originally conceived in order to examine the motivation to use new technologies in the workplace. Two elements; ease of use, and usefulness were added to TRA. Ease of use simply indicated that the use of a system would be free from effort, while usefulness was a measure of how a system could improve work performance. Despite these apparent limitations and apparent lack of suitability for examining mobile games, TAM has been used with extensions of the model to explain why people play online games (Hsu & Lu 2004) and the adoption of mobile games (Ha, Yoon & Choi 2007). While Hsu & Lu extended the TAM model to include flow experience and social factors as additional variables, in effect offering support of the construct of flow offered later in this thesis, one question that needs to be asked, however, is whether behavioural intention acts as a suitable dependent variable. Dependent

variables such as usage and intention to use have been identified as a potentially flawed measure when it comes to the self reporting of system use (Kahn, Ratan & Williams 2014). Ha, Yoon & Choi (2007) sought to explain the adoption of mobile games finding that the TAM, specific and defining, variable of usefulness did not have an impact on the adoption of mobile games.

TPB (Aizen 1991) is a theory that states that attitude toward behaviour, subjective norms, and perceived behavioural control, when combined, contribute to an individual's behavioural intentions and behaviours. Armitige & Connor (2001) in their meta-analysis of the theory found support for the efficacy of the TPB as a predictor of intentions and behaviour. Prugsamatz, Lowe & Alpert (2010) utilised TPB to model consumer entertainment software choice and the theory was extended by Lee (2009) to understanding the behavioural intention to play online games. Prugsamatz et al. (2010) in finding 'that external constraints such as subjective norms and perceived behavioural control are relatively minor determinants of intention to purchase computer games' (p384), re-enforces the point that TPB does not address gaming as an intrinsically motivated experience. It seems that Prugsamatz et al's understanding of the existing video game literature is limited and the approach ignores established knowledge in the literature in order to establish a more marketing specific TPB framework and questionnaire.

Lee (2009) extended both TPB and TAM with flow experience, perceived enjoyment, and interaction to propose a conceptual model to explain behavioural intention to play online games. Comparing the two models Lee (2009) found that TPB was superior to TAM in explaining behavioural intention and that 'this study demonstrates relatively satisfactory results with the extended TPB model' (p867). Referring to Aijen (1991), Lee identified a limitation in his study that the relative importance of the components of TPB in predicting behavioural intention may vary according to the specific behaviour and situation. As previously mentioned, mobile video game play by definition is subject to the varied situations players find themselves in, even more



so than traditional situated video gaming. The importance of the flow experience and enjoyment established by Lee, provide useful outcomes for this research.

This study finds that both TAM and TPB do not offer a comprehensive models in terms of understanding intrinsic motivation, and although elements of the theories are useful in terms of explaining elements of video games, overall they are limited in providing a framework to understand mobile gaming and intrinsic motivation.

### **Uses and Gratifications as Media Choice**

Blumler & Katz' (1974) Uses and Gratification Theory (UGT) suggested that media users play an active role in their choice and use of media. The users are goal orientated in selecting a media that will satisfy their needs and result in gratification. According to Rubin (1981) uses and gratification theory has been used to explain media choices for over sixty years. Ruggiero (2000) identifies its origins as a sub tradition of media effects research with origins situated through several studies situated across varied forms such as radio, reading, television viewing, music, comics and newspapers. Early UGT studies were primarily descriptive and little theoretical coherence. Uses and Gratifications theory focuses on media use and assumes users to be active, purposeful and selective in their choice of media, allowing examination of the motivations behind the choice and use of media (Krcmar & Strizhakova 2009). UGT is typically examined by using a validated viewing motives questionnaire as a starting point, for example Rubin (1981). Subsequently this data can be used to examine patterns in media use among different individuals (Rubin 1983).

Criticisms of UGT are fairly common according to (Rubin (2002), and Krcmar & Strzhakova (2009). These include researchers attaching different values to the UGT constructs depending on the context being investigated and even a lack of conceptual clarity in the concepts themselves.

The treatment of the audience as being too actively rational in judging their behaviour and the reliance on the methodology of self-report has also been extensively criticised. Strzhakova & Krcmar (2003) question whether viewers actually have access to their viewing motives while Nabi, Stitt, Halford & Finnerty (2006) suggest that audiences are not as active in their media choices as the UGTs literature suggests. Finally a problem exists in that many media use typologies that exist for each individual media can't be shared at a broader level due to the various motives behind each medium, restricting UGT as a meaningful approach (Krcmar & Strizhakova 2009). 'Skeptics may question the theory for a lack of empirical distinction between needs and motivations and the obstacles of measuring the gratification of needs' (Ruggiero 2000 p26). Ruggiero (2000) further identifies polemic over whether UGT satisfies the standard of a fully-fledged theory and continued criticism within academia that the perspective embodies a functionalist approach that fails to add to conceptual frameworks. Sherry (2004b) identified that the UGT has mainly been focused on developing typologies of media use motivation and that 'these distinctions provide useful descriptions of people's media use motivations, but typologies alone do not constitute useful theory' (p100). However they do provide useful starting points and frameworks and despite these criticisms UGT has been used extensively to explain a wide diversity of media uses ranging from television (Rubin 1981,1983) to interactive online advertising (Ko, Cho & Roberts 2005). In terms of video games, UGT has been examined in the context of social networking games (Hou 2011) and as a predictor of video game use and preferences (Sherry, Greenberg, Lucas & Lachlan 2006). Indeed this study, while not utilising UGT as a framing theory, utilises elements of past work to complete the conceptual model. The previous criticisms of the theory established here and that it fails to fully reflect the earlier definitions of play guiding this research means that Uses and Gratifications does not provide the optimal starting point for exploring the research questions posed in this research.

## **Selective Exposure and Mood Management**

Selective exposure theory (Festinger 1957) and mood management theory (Zillmann 1988) are two linked theories that can offer some explanation towards the motivation behind media choice and by extension, video games. Festinger's (1957) theory of selective exposure is based on the assumption that individuals will avoid media or entertainment that they feel will create dissonance and instead will exercise autonomy in their media choices and filter what they are exposed to. Zillmann (1988) extends this theory to posit that individuals select different types of media entertainment in order to regulate their moods. Individuals will arrange internal and external stimulus conditions in order to minimise negative moods and maximise or enhance good moods. Mood management is perhaps the most prominent account of why individuals enjoy the experience of emotions in media use and the theory assumes that individuals prefer an intermediate level of arousal that is experienced as pleasant and will seek out entertainment or media content to fulfil these needs. A large part of mood management has been conducted experimentally (Knobloch & Westerwick 2006) as investigating mood management via surveys can be problematic due to lay rationalisations and the social desirability of certain responses are likely to bias self-reports (Zillmann 1985).

Elements of selective exposure and mood management have been examined theoretically in the context of video games (Vorderer, Hartmann & Klimmt 2003, Bryant & Davies 2006, Olson 2010) and in controlled studies. (Bowman 2010, Chen & Raney 2009) Crucially 'Disposition theories, like mood management, are difficult to apply to video and computer games' (Vorderer, Bryant, Pieper and Weber 2006, p4) due to the distinction between passive media such as TV and interactive media such as video games. It is difficult to explain the process of enjoyment that users feel as they play a game as the game may not turn out as originally intended due to its interactive and subsequently unpredictable outcome. (Bryant & Davies 2006)

However Bowman (2010) argues that video games, due to their interactivity and subsequently higher involvement, have a greater potential for mood repair than traditional media forms. Mood management also has parallels to Vorderer's (2000) theory of playful action in that it is intrinsically motivated and attractive due to its potential in creating arousal in the player, a change in reality will affect moods and that it can be assumed to be frequently repeated, as experience with a game will allow a player to understand the impact it will have on their mood. While mood management does not form the basis of this thesis, elements of the theory inform aspects of this study.

### **Social Cognitive Theories**

Social Cognitive Theory (SCT, Bandura, 1989) is based on Bandura's (1977) interpretation of Social Learning Theory. SCT is described by Bandura (1989) as reciprocal, casual relationships among the environment, individuals and their behaviour. In other words, new behaviours are not learned solely by people attempting them but rather as a combination of this, observing others and the environment they are in. In effect, cognitive schemas arise from a combination of direct and observational learning. Eccles & Wigfield (2002) characterize SCT as an expectancy theory; that is behaviour is guided by expectations regarding outcomes. The main components of SCT can be seen as outcome expectations, self-efficacy and self-regulation (LaRose 2009) and the theory has been quite successfully applied in investigating media choice and usage (LaRose & Esaton 2004).

SCT can be seen as particularly useful in explaining the adoption of new technologies due to observed behaviour of others (Bandura 2001, Rogers 1995). 'Recent research provides preliminary evidence of (SCT)'s superiority to one of the leading paradigms of media choice, UGs, and it also fills important conceptual gaps in TPB' (La Rose 2009 p27). Yet despite this

SCT as a whole theory does not quite explain motivations in usage or enjoyment but rather offers an explanation of a wide range of media behaviours (LaRose 2009). However one component of SCT that can be seen to explain motivations is self-efficacy (Bandura 1997). This is the belief that an individual can achieve a certain outcome, in effect a belief in one's own competence. In regards to a given task, people generally have a higher level of motivation where they believe in their chances of success, avoiding situations where their self-efficacy is low (Shunk 1990). Self-efficacy has been proposed as a motivational factor regarding video games in several studies (Klimmt & Hartmann 2006, Klimmt, Hartmann & Frey 2007, Buckley & Anderson 2006), a factor in the adoption of mobile banking (Luarn & Lin 2005) and mobile commerce service adoption (Pedersen 2005), although this study utilises elements similar enough to the concept to not warrant its inclusion.

The previous theories examined in the literature, while all offering positive and negative points in offering a starting point for the examination of the intrinsic motivations for play on smartphones, fail to fully satisfy the previous definition of play offered here. Indeed given the sheer complexity of explaining the enjoyment of media and play (Vorderer, Klimmt & Ritterfeld 2004), it was found that Self Determination Theory offered the most salient starting point to begin understanding the intrinsic motivations of smartphone play.

## **Appendix 1.9 Full Discussion of Managerial Implications**

### **Gamification**

Gamification has been defined as both gaming elements in non gaming contexts and the process of game-thinking and game mechanics to engage users and solve problems. The smartphone due to its accessibility and capabilities offers the perfect vehicle for gamified applications in marketing, health, work or educational fields. The results of this thesis provide support for a number of considerations when considering a gamified vehicle on a smartphone.

One obvious aspect for marketers when considering a gamification aspect may be as a means to win or earn rewards. Zichermann & Cunningham (2011) warn that over time, an excessive dependence on “free stuff” or discounts, which is a form of extrinsic motivation, habituates players to constantly expect that as a condition of purchase. Alternatively they advocate for four potential prizes as a system of rewards in terms of gamification; status (the relative position of an individual in relation to others, especially in a social group), access (to VIP functions or skipping a queue), power (a position of authority within the gaming group), and stuff (products, discounts etc.). These prizes are listed in order from the most to the least desired, the stickiest to the least sticky, and the cheapest to the most expensive (Zichermann & Cunningham). This should prove as an important reminder to marketers on the perils of cheapening or lowering brand value, at least in terms of longer term gamification schemes. In terms of short term gamification campaigns it may still be valid to offer prizes for the duration of the promotion. But it can be seen that in gamification terms that the reward for achievement most desired is reflective of the satisfaction of the Need for Competence. While this may be a strong argument for a focus on intrinsic motivation in terms of gamification design there still remains the need for the push for the adoption of system. Zichermann and Cunningham (2011) consider an optimal gamification design to be one that works better if and when intrinsic and extrinsic motivations are aligned. In effect, when designed well, it feels intrinsic to the player. And key to achieving this balance, understanding your customer and their motivations. Allowing your player to feel competent and autonomous within your games will optimally make the game an intrinsically motivated consumption with extrinsic rewards relegated to a secondary consideration. Groh (2012) states that gamified applications have to address the user’s competence need through offering tasks in a challenging way, and by implication, in an autonomous manner, by keeping them interesting. And in the case of mobile gaming and gamification the system need not be a linear model of game to rewards. Zichermann and Cunningham (2011) cite the case of the popular game

Farmville (App based Facebook game) in conjunction with 7-11 and their ubiquitous Slurpees (sweet flavoured crushed ice drink). In this case purchase of a Slurpee resulted in free virtual currency for the game. In effect, the value of the virtual economy outweighed the real one but facilitated player's progress in the game, further satisfying the needs for competence and autonomy.

Gamification has been implemented outside of the traditional producer to customer paradigm with systems being implemented within workplaces in order to maximise employee motivation and productivity. Thom, Millen & DiMicco (2012) identified gamification as the aim to create a sense of playfulness in non-game environments so that participation becomes enjoyable and desirable. They studied patterns of user activity in an enterprise social network service after the removal of a points-based incentive system. Their results revealed that the removal of the incentive scheme did reduce overall participation via contribution within the SNS. The impact of the removal of the points system in effect denied users the sense of competence achieved through the points. Consistent with this research they found that the more competitive aspects of the game intimidated some users while the rewards enhanced employee interactions and relatedness.

Mobiles and gamification can also make use of a mobile's capabilities such as location sensors. Fitz-Walter & Tjondronegoro (2011) examined at how context could be used to create achievements that engage people at a university orientation event. Their findings indicated that students benefited more from the gamified version than traditional orientation in terms of combining an enjoyable experience with broadening their experience of campus life. Through connecting socially with other students in order to unlock achievements there is also potential for gamified systems like this to increase social networks and satisfy the need for relatedness.

Low, Goh & Lee (2012) also found that gamifying aspects of apps, such as mobile content sharing apps, led to benefits such as increasing awareness for the application and addressing the “cold-start” problem inherent in many newly introduced apps. This reflects the perspective that gamification need not be an end goal but a mechanism as part of a greater whole. But at the root at all these potential uses for gamification lies the fact that any gamified system must be enjoyable. Games and gamification must be challenging but not too hard, allowing the satisfaction of the need for competence. This can be achieved through providing feedback on how players are doing through devices such as points, levels, badges or leaderboards (Zichermann & Cunningham 2011). The player must have a range of choices and options in how they approach the game in order to satisfy the need for autonomy. The game must allow for players to immerse themselves somewhat so that they achieve a sense of flow. Gamified systems on smartphones need to take these factors into account rather than create a game merely as a brand platform. And it remains important for marketers to understand what they need from a system rather than merely delivering a brief to game designers. Marketers must understand exactly what consumers want *from* a game rather than understanding that consumers may simply want a game.

### **Implications of this research for games as services and understanding the Freemium model.**

The service paradigm, previously established in the games industry, had been one of games as commodities or goods, yet the advent of games as activities has opened up the an understanding of the value of games as services (Stenros & Sotamaa 2009). Basole & Karla (2012) identified that the mobile app store is playing a particularly transformative role in how value is created, delivered, distributed, and consumed with a special focus in all app stores placed on mobile gaming, as the majority of the most popular applications are mobile games. They reconciled this transformation with service-dominant (S-D) logic (Vargo and Lusch 2004, 2008), one of the



central tenets of service science. S-D logic is based on the idea that service is the fundamental basis of value creation, that value is not created in the traditional sense of a producer to consumer supply chain but instead that all stakeholders in a service are interconnected in a service system. This is removed from the traditional marketing ideas of a goods production based model. The consumer's role in the current app ecosystem has become a vital one. Consumers now have the ability to instantly leave feedback on all aspects of the game, visible to other consumers, thus having an immense effect on the relative success or failure of a game. The enterprise (in this case game developers) can only make value propositions and the success of service based products will depend on the success of the value co-creation between customers and producers (Vargo and Lusch 2008). This re-enforces findings of this research of the importance of satisfying customer's needs for Competence and Autonomy. Developers should optimally utilize customer feedback in order to enhance satisfaction of these needs if they want their games to be successful or continue as a successful service based good with ongoing revenue streams such as Clash of Clans or Candy Crush Saga. These games represent a shift to what Stenros & Sotamaa (2009) cite as unmistakable business logic; the shift to creating a continuous profitable relationship rather than a one off payment for a good. Liu, Au & Choi (2012) conducted one of the first academic studies to empirically assess and quantify the effects of the freemium strategy on the market performance of mobile apps, utilising Google Play for their study. They identify that mobile apps as opposed to traditional software, which is often driven by a demand side economy, are characterized with minimal learning and switching costs. The visibility and quality of a traditional paid app are the two critical factors for success. The ranking list offered by an app delivery platform such as Google Play provide a unique opportunity for apps to be visible to consumers at no cost (Liu, Au et al. 2012). The flip side of this opportunity is the difficulty in penetrating the sheer volume of alternative apps in order to rise in the rankings. Paid apps who suffer from poor rankings are adopted on the basis of reviews of other customers. The freemium

model on the other hand in ‘offering consumers the trial version of a mobile app for free, is positively associated with higher sales rank and revenue of its paid version. This finding yields a strong support for the freemium strategy adopted by a number of developers in the Android app market’ (Liu, Au & Choi 2012p 13). In effect, offering a free version is an effective method to increase the visibility of a lower-ranked or newly-introduced app as providing consumers an opportunity to trial an app for free benefits the developers both in product visibility and revenue. Crucially for the purposes of this study when it comes to hedonic apps such as games, consumers are more likely to rely on their personal experience rather than reviews from others which emphasizes the importance of satisfying the needs identified here in the proposed model. The higher the quality of the product, the more people play and subsequently the higher the revenue stream. The free version of an app reduces the importance of reviews as consumers can use their own evaluative criteria to judge whether an app is worth investing in. Liu, Au & Choi’s (2012) findings contradict fears that consumers who would have paid for the app continue with the free version instead as their study demonstrates the benefits of the freemium strategy outweigh any potential loss.

The case of the Freemium model and in-app-purchases provide insights into how games as services and the results of this research intersect. Firstly, if the two most important needs of competence and autonomy are met a player will become more engaged with the game they are playing. In this case in-app-purchasing will allow a player to enhance their satisfaction of their needs in subsequent play. Alternatively if these needs are not satisfied initially, the enhancement of a players competence or autonomy through in-app-purchases may allow a player to enjoy a game more and thus as a consequence result in future play and subsequent purchases. This can be illustrated through the relatively short time period of play before an initial purchase (CGA 2013).

The following examples provide a more thorough understanding of how the model in this research can explain the Freemium model. All the examples used offer the option of a quick play session or a longer more involved play experience. Players can use these games for a quick escapist experience or for a longer session that may engender the Flow experience. It is the needs identified in SDT and the PENS scales that provide the keys to the successful monetisation of these free to play games.

Candy Crush Saga is a perfect example of how the freemium model excels when done correctly. A relatively simple puzzle game at first with a relatively easy learning curve, Candy Crush offers opportunities to satisfy the needs for competence and autonomy throughout. Candy Crush basically consists of a game board filled with different colored candy. Players must use simple mechanics to rotate various candies in order to create adjacent sets of identical candies of three or more.

Fig XXX Candy Crush Saga



Source [www.usgamer.net](http://www.usgamer.net)

Boosters are devices can be used to provide assistance during a game and thus increase your sense of competence. These boosters can be earned (increasing your competence) or purchased when you need them, which provides a sense of choice (increasing your autonomy and subsequently your competence). When to use boosters is an important autonomous element of the game. Special candies are another aspect of the game that allows players to achieve their aims and customize their play and options/choices. These special candies are activated by lining up four or five of the same candy in specific formations thus creating different effects, again increasing a player's sense of competence through achievement or sense of autonomy in which specific special candy you choose to create. The manner in how complete each level is up to the player, there are many different choices, strategies and options to take (or purchase) in order to

satisfy your need for autonomy and subsequent need for competence upon completion. Players begin the game with five 'lives' which are lost when players fail to complete a level or fail to earn enough points doing so. Even failing a level can increase players desire to satisfy their need for competence through beating the level that defeated them. This is where players may choose to purchase more lives through in app purchases. The game is originally free to download, so many players may not feel compelled to do so but many players do, as they enjoy satisfying their needs and beating the game. An alternative option to purchasing lives can be related to the satisfaction of the Need for Relatedness. Players may request lives from their friends on Facebook. This option has been credited with helping the game become more successful as new players may be enticed through Facebook requests. Friends can make the game easier through providing various benefits. The game consists of a certain number of levels per episode. Once the player has become involved enough to complete an episode they can purchase the next episode or alternatively utilize their Facebook friends through requests. More patient player can wait for their lives to replenish at a rate of one every half an hour although if they're enjoying their play session this may prove difficult. Again as with any new purchase, the initial usage period is often the heaviest reflected by the short period before the average first in-app-purchase. The Need for Relatedness may also be satisfied through involvement among friends outside of direct play through the sharing of a common interest and discussions surrounding the game itself. Perhaps even seeing friend's posts surrounding the game on Facebook allows players to feel connected through a shared cultural artefact.

How Clash of Clans works in terms of the Needs of Competence and Autonomy reflect the previous example of Candy Crush in terms of certain mechanisms. A strategy game, Clash of Clans requires players to build a base where they generate resources and accumulate armies in

order to attack other player's in order to steal their various resources and advance themselves within the game.

**Fig xxx.xxx Clash of Clans**



Source: [www.appsrush.net](http://www.appsrush.net)

First of all the player has choices in the various components of the base they wish to build. There are a myriad of options as you progress through the game and these options are consistently being added by the developers. Should a player build more walls, develop stronger defensive weapons or units, or generate more in game gold, elixir or gems? All these choices and more provide a lot of satisfaction for autonomy and subsequently, competence. Within all these choices and options lie even more opportunities to satisfy your needs. How to utilize your resources provides the player with infinite possibilities. Does the player use gold to upgrade their bases and defences and resource collection? Or does a player use elixir to train troops and

upgrade certain buildings? Gems form the premium currency in game and the most difficult to obtain but is relatively simple when you purchase it using real money in in-app-purchases. Completing certain achievements will earn a player gems but purchasing gems will make it easier to earn gems. Gems can also be used to purchase shields so that other players cannot attack your base thus allowing the player the freedom to satisfy their need for competence through building up their base and resources although they lose their shield by attacking others. When your base is attacked your choices of defensive tactics will influence if your attacker is successful or not as while you don't actively defend your base, your previous choices determine how difficult it is to attack. Of course all this is always simpler through making in-game-purchases and as a result increasing your capabilities and options.

As players build up your bases and resources they are also building their army. Different troops provide players with different options and choices in how to be effective in resource use and battle strategy. There are many different options in terms of what troops to use with different categories of troops requiring more resources. Within categories you can upgrade your troops utilizing resources. The lower category troops are cheap, numerous and include barbarians, archers and goblins, each with specific abilities, weaknesses and strengths that allow players choices and options in how they play. Higher category troops such as Giants, Air Balloons or Dragons cost more but increase the satisfaction of competence and autonomy. If players want to have the option of utilizing these troops then in-app-purchases provide the quickest route. Attacking opponents can result in trophies, resources and a measure of how well the player did it according to a three star rating system. Destroy 50 % of their base, one star, destroy their central Town Hall, two stars, obliterate them, three stars. Failure to destroy 50% of whom the player attacks results in a loss of previously earned trophies. For an optimal playing experience it is in the players interest to make purchases quickly rather than 'grinding' (the process of engaging in

repetitive tasks in order to generate in game resources for upgrades) to enhance their in game experience through satisfying their perceived needs for competence and autonomy.

However the satisfaction of the Need for Relatedness in this game could be the key to its success given the sociable nature of the game. Players organize themselves into clans who support and socialize with each other as well as provide a sense of identity. This is the central component of the game which is played on mobile devices already equipped for social communications. Shade (2013) identifies that Clash of Clans is the best mobile game for a new era of ‘conjoint’ gaming where players play and co-ordinate together for the benefit of themselves and their clan. Rose (2013) interviewed the lead designer of the game and identified key design considerations that have allowed the game to be successful. Allowing the game to be accessible to both casual and hardcore players through choice and options in how they could play allowed players to satisfy their individual needs for competence. Similarly a gradual learning curve that didn’t overwhelm players with tutorials allowed players to integrate with the game at their own pace. The social aspect was important in satisfying players’ Need for Relatedness. One key aspect, was that players could choose to be competitive or not, with play accommodating competitive and non-competitive players alike.

But in terms of competition, both Candy Crush Saga and Clash of Clans don’t have an explicit personal competition element. With Candy Crush it’s a challenge against the game itself. While even though Clash of Clans requires the attacking and defending against rival players, it’s in no way a personally targeted approach as players choose who to attack based on their perceived opportunities for success rather than any perceived animosity or rivalry. The runaway success of these two games without explicit competition reinforces the findings of this thesis. Clash of Clans, at the time of writing, is planning to introduce a competitive element through wars between clans (Liebl 2014). This would suggest an augmentation of the games structure that may



have come about due to feedback and demand from fans. As Takahashi (2014) in an interview with Supercell CEO Ilkka Paananen found ‘It all comes from this mentality of thinking of a game as a service, rather than just a product. One of our explicit missions is that every single week, we want to make these games better for users. They always have to become better’ (Paananen 2014). Here is a case of a competitive element being added to augment the product rather than initially being part of the offering. Of course this development will also allow players to test their competence, provides more opportunity for autonomous actions within the game and will allow players to feel closer to their clan as a result of a shared enemy, increasing their sense of relatedness.

As suggested by Sierra & Taute (2014) video games provide a unique communicative playground for advertisers where the gamer is more involved than a passive observer. They observe that video game advertising is customizable and here is where the in-app-purchases can be optimized. If a player hasn’t made a purchase maybe the game can offer a discount on purchases to entice them. Alternatively if a player struggles with a certain aspect of a game then offers of the requisite solution through an in-app-purchase may be applied. If a player plays a lot then expansions of the game may be offered. Football Manager Handheld is not a freemium game and can cost \$10.99. An extension of the popular and addictive PC game that has been cited in divorce cases, it offers purchasable options for further play despite the game’s initial \$10.99 price point. In the game players assume the position of a football manager of their chosen club from many of the world’s leading league with all the responsibilities associated with the role. Faced with the dream of choosing to manage your small local football team with no money, a player can purchase the option of a rich benefactor for the club so that players can easily fulfil their dream of their heroes rising to eminence through ‘millions’ being bought for a couple of dollars. In effect this would make the game easier, similar to the effect rich owners/benefactors

have had in real life in the English Premier League. This would satisfy the Need for Competence while allowing the player many more choices in game, satisfying the Need for Autonomy in-game. In game advertising within these games also allows the freemium models to advertise games of a similar genre to what you're playing, usually from the same developer, offering the developer more opportunities to ensnare a player with relevant choices to purchase.

This research proposes the application of the proposed model focusing on Clash of Clans, Candy Crush Saga and other games and can be found in appendix 1.3.

### **Advergaming, In-game advertising**

The results of this research indicate quite clearly the importance of well designed advergaming.

With a well designed game that satisfies the needs of competence, autonomy and relatedness and allows a sense of flow will result in enjoyment of a game. In fact in terms of brand equity a poorly designed game may have a negative impact. Martí-Parreño, Aldás-Manzano, Currás-Pérez, Sánchez-García (2013) demonstrated that in terms of a casual advergence, entertainment (enjoyment) is the primary driver of any resulting positive brand attitude and that any intrusiveness or incongruence has a negative effect. Yüksel (2013) tells us that advergaming is about achieving an unforgettable experience for a player where any brand values or placements are covertly enhanced. Yüksel (2013) in particular stresses the importance of the player achieving the flow experience for success with any any advergence. Mobile and smartphone games with their ubiquity, inbuilt social capabilities and cheap/free easily accessible download model possibly provide the ultimate vehicle for this particular medium. Given that advergaming is becoming more prevalent due to younger consumer's online immersion (Adis & Jun 2013) the results of this research indicate that as younger players are more likely to play multiplayer games an optimal advergence should incorporate multiplayer options into any endeavor. This also has

the benefit of viral marketing through social media. Indeed Okazaki & Taylor (2013) identified that various firms have begun integrating with social networking sites by offering free online games as games help firms to increase the site and brand entertainment value and thereby enhance the “stickiness” factor. Any such games must satisfy the needs identified in this research in order to prove successful.

In-game advertising remains an avenue of great potential. With most freemium customers accepting advertisements as the price of a free service (Wagner, Benlian & Hess 2013) and the success of this business model now established in terms of mobile gaming there remains further opportunities for advertising in this model that may be yet unexplored. Rosenkrans & Myers (2012) demonstrated that there is potential inherent in mobile advertising, with their research finding that mobile advertising can result in click through rates superior to traditional web advertising. Their recommendations included further considerations on location based advertising to provide tailored messages at the right time and place. This thesis confirms that the mobile game remains ultimately a distraction or time filler for most players. Location based advertising could offer players complimentary or alternative activities, such as cafes or restaurants nearby. Given that a lot of mobile play is at home, delivery services may also be a viable option. However the most viable advertising would remain alternate games and in-app purchases. This while, remaining the most common characteristic of any consumers playing a game on their smartphone, would also facilitate satisfaction of the Needs for Competence and Autonomy established in this research.

### **Mobile Marketing**

Mobile Marketing is defined as the use of the mobile device for marketing communications and its relevance as a medium is defined through four key characteristics; Ubiquity, personalization,

two way communication and localization (Phumisak, Donyaprueth & Vatcharaporn 2010). While this research does not explicitly examine mobile marketing it is possible to infer certain conclusions relating to this relatively new area of study.

Given that effective mobile promotion strategy requires the channel to be used as a complementary tool for traditional media(Phumisak, Donyaprueth & Vatcharaporn 2010) smartphone games could prove an effective part of relevant marketing mixes. Particularly given the trend towards games as services where players are becoming more used to an ongoing relationship with suppliers (Liu, Au & Choi 2012). Satisfying the relevant intrinsic motivations established in this research however would be key to ensuring that any mobile game or gamified aspect of a communications strategy would prove beneficial. In fact, Davis & Chaudhri (2012)define the whole mobile experience itself as important for marketers in that all services are being increasingly used to experience some form of play. This points to a use of the PENS scales beyond the explicit examination of play. Does an app engender satisfaction of the needs for competence, autonomy or relatedness? Is the Flow experience key to an apps success? Does a good app allow for escapism? Davis & Chaudhri's (2012) conclusions would indicate that yes, a good app would be suitable as being examined similarly to a game on a smartphone. Given that playful people experience and enjoy games differently, there may be scope for companies to target more playful people as early adopters of any game related marketing activity. While identifying these players through an application of the playfulness scale here would prove almost impossible, there may be capabilities based on existing consumer data to extrapolate consumers who may fit this profile. Playfulness is still a relatively new concept in terms of adult behaviour and remains quite fluid as a concept. Firms could apply the recommendations of Watson, McCarthy & Rowley (2013) in applying a repertoire of pull marketing communication approaches, including website content and applications that customer's value. Playful people

would it seems, value games more and as a result would be more susceptible to engaging with games as part of a strategy. It is recommended here that the conceptual model established here has the potential to be adapted and applied in terms of understanding the use of apps in general.

## Appendix 1.10 Full survey

### Question 1 Screening question: two items

Which of the following best describes your mobile phone?

- Smartphone, i.e., a phone with advanced computing capabilities that can run applications or “apps” and uses an operating system such as iOS (iPhone), Android (Google), Blackberry OS, Windows Mobile, Symbian, Palm / HP OS, or similar.
- Basic cell phone, also known as a “feature phone”, i.e., a phone that cannot run “apps”, but may have a built-in camera, messaging services, calendars, etc.
- None of these.

Which of the following activities do you do on your smartphone? Tick all that apply.

- Online Banking, Surfing the Internet, Listening to Music, Playing Games, Skype, Checking the Weather, Watching Videos, Facebook, Twitter, Other Social Media, Health Applications, Taking Photos.

### Question 2 Gender: one item

Please choose your gender

### Question 3 Age: one item

Please choose your year of birth

### Question 4 Competence: three items

Reflect on your smartphone play experiences and rate your agreement with the following statements:

- I feel competent at games on my phone.
- I feel very capable and effective when playing games on my phone.
- My ability to play phone games is well matched with the games’ challenges

### Question 5 Autonomy: three items

Reflect on your smartphone play experiences and rate your agreement with the following statements:

- The games I play on my phone provide me with interesting options and choices
- The games I play on my phone let you do interesting things
- I experience a lot of freedom in the games I play on my phone

**Question 6 Relatedness: three items**

Reflect on your smartphone play experiences and rate your agreement with the following statements:

- I find the relationships I form in games on my phone fulfilling.
- I find the relationships I form in games on my phone important
- I don't feel close to other players in games on my phone. (-)

**Question 7 Social Escapism: eleven items**

Please rate your agreement with the following statements 'I play games on my smartphone'.

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

**Question 8 Competition: four items**

Please rate your agreement with the following statements 'When playing games on my smartphone'.

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

**Question 9 Flow: three items**

Instructions: The word “flow” is used to describe a state of mind sometimes experienced by people who are totally involved in some activity. One example of flow is the case where a user is playing extremely well and achieves a state of mind where nothing else matter but the video game; you engages in a video game with total involvement, concentration and enjoyment. You are completely and deeply immersed in it. The experience is not exclusive to video games: many people report this state of mind when web pages browsing, on-line chatting and word processing. Thinking about your play of smartphone games.

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

**Question 10 Playfulness: fifteen items**

‘The next section will ask you to rate certain aspects of your personality on a scale from one to ten. Please think about each answer carefully as it applies to you in comparison to other people.

Please rate yourself on how the following characterises you’

- Cheerful, Happy, Friendly Outgoing, SociableSpontaneous, Impulsive, Unpredictable, Adventurous,Clowns Around, Jokes/Teases, Funny, Humorous,Active, Energetic.

**Question 11 Enjoyment: three items**

Please rate your agreement with the following statements

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

**Question 16 Qualitative Questions: two items**

Where or when do you play games on your phone? (optional)

Why do you play games on your phone? (optional)



**Question 17 Usage, Gamer Segments & Single/Multiplayer: three items**

How often do you play games on your smartphone?

- Once a month.
- Once a week.
- A few times a week.
- Once a day.
- A few times a day.
- Continuously throughout the day.

Please describe your gamer status, apart from on your phone

- Non-Gamer; I only play on my phone.
- Casual Gamer; I sometimes play on other devices.
- Hardcore Gamer; I play games a lot on different devices.

Games can be identified as either Single-player (Where you play by yourself) or Multi-player (Where you play with other people or connect through a social platform such as Facebook).

Please identify your playing habits in regards to splitting your time between the two.

- Multiplayer only.
- Mostly multiplayer and some Singleplayer.
- Multiplayer and singleplayer.
- Mostly Singleplayer and some multiplayer.
- Singleplayer only.

**Question 18 Play locations and Game Genre. Two items**

Where do you play games on your smartphone? Please tick all that apply

- At home.
- At work or university.
- Restaurants, bars or parties.
- Public Transport.
- In the car.

Which games do you play? Please tick all that apply.

- Sports & Racing (examples; Golf, Soccer, Basketball, Rugby, Tennis, Need for Speed, Fearless Wheels, Fifa 2013, Madden 2013)

- Brain & Puzzle (examples; Words with Friends, Draw Something, Bejeweled, Tetris, Cut the Rope, Sudoku, Crossword, Chess, Scribblenauts, Trivia)
- Arcade & Action (examples; Angry Birds, Temple Run, Fruit Ninja, Plants vs Zombies, Pinball, Call of Duty)
- Strategy, Simulation & Role Playing Games (examples; Sims, Minecraft, Simcity, Farmville, Mafia Wars, Civilisation, Command & Conquer, Worms)
- Cards & Casino (examples; Poker, Texas Holdem, Bingo, Blackjack, Slot, Solitaire, Baccarat)

## **Appendix 1.11 Conference paper**

McCauley, B., Kopanidis, F. Z., Farrelly, F., (2013) 'Antecedents of Smartphone Play' World Marketing Congress 17-20 July – Monash University, Melbourne.

### **Towards an understanding of the motivations to play games on smartphones.**

#### **Introduction**

Smartphones are rapidly becoming ubiquitous personal items that continue to evolve and shape our future consumption experiences. The applications (apps) used on these smartphones are beginning to redefine modern life and are being consumed at a rapid pace. Almost half of all app downloads to our phones can be identified as games. In an era where a gaming franchise such as Angry Birds has been downloaded over one billion times and has launched a lucrative merchandise empire, the impact of gaming in our lives cannot be underestimated. These consumption patterns continue to define what is fast becoming an 'emerging ludic society' (Kallio, Mäyrä, & Kaipainen, 2011). Implications for marketers lie in the growing area of gamification (Deterding, Dixon, & Khaled, 2011), the use of game design elements, game thinking and game mechanics to enhance non-game contexts. As we are now entering an age where gaming has moved from being part of an exclusive subculture to being a social norm (Kallio et al., 2011; Mäyrä, 2008). This research seeks to fill a gap in the consumer behaviour literature by providing a conceptual model to explain the motivations behind consumer's usage of games on their smartphone. Since the continuing cultural penetration of video games is inevitable, employing new theoretical models and empirically exploring these domains becomes ever more important in order to inform more effective health and education interventions as well as advancing the basic science of humans at play (Przybylski, Rigby & Ryan 2010). This

research also extends the relatively nascent research on adult playfulness through the application and extension of Barnett's (2007) Young Adult Playfulness Scale.

## **Background**

In order to develop a model for this research, the conceptual argument that “uniting work in the psychology of intrinsic motivation, the cognitive analysis of fiction-based forms of entertainment, and the evolutionary and developmental psychology of play, provides an integrated causal model for the study of entertainment” (Peter. Vorderer, Steen, & Chan, 2006, p. 14) was used as a framing device in order to develop a comprehensive model to explain the consumption of games on smartphones. This research establishes a theory of intrinsic motivation as a base, extends it with context relevant variables and then incorporates a variable based on the psychology of play and these are discussed in the following sections.

### **A Theory of Intrinsic Motivation**

Self Determination Theory, (Deci & Ryan, 1985 ,SDT) is a theory of intrinsic motivation that has been used in a number of contexts such as sports, health & education. A sub theory of SDT is Cognitive Evaluation Theory (CET) which proposes that intrinsic motivation is based on the satisfaction of three universal human needs for competence, autonomy and relatedness.

Ryan, Rigby, and Przybylski (2006) developed the Player Experience of Need Satisfaction (PENS) to find that SDT's theorised needs for autonomy, competence and relatedness could predict enjoyment and usage of video games. The advantages of using SDT, over other theories, is that these motivational processes are robust predictors of motivation beyond differences in player demographics and can apply across different game types or mediums (Przybylski, Rigby & Ryan 2010) thus providing a solid foundation to examine overall player motivations. Utilising the needs established in SDT as a reference point and examining the defining characteristics of

mobile games it is possible to further develop a model to increase our understanding of what motivates mobile play. Playfulness as a trait will be examined as a moderating variable. According to the literature mobile gaming's key characteristics include; accessibility, (Hjorth & Richardson, 2009) use as entertainment to fill empty time or idle moments (Li & Counts, 2007) and as a socially connected device (Hjorth, 2011).

### ***The Need for Competence***

Eccles and Wigfield (2002) identify the experience of flow as the immediate gratification of our need for competence. Csikszentmihalyi and Csikszentmihalyi (1975) definition of flow (1975, p. 36) is the "holistic sensation that people feel when they act with total involvement." Flow has been shown to be an important factor in the enjoyment of video games (Cowley, Charles, Black, & Hickey, 2008; Hsu & Lu, 2004) but hasn't yet been examined in the contexts of mobile gaming. Given the more traditionally casual nature of mobile games it remains to be seen whether the concept of flow

### ***The Need for Autonomy***

In SDT, autonomy concerns the desire to self-organize one's actions, when the individual can freely pursue the activity and feels volitional in doing so (Deci & Ryan, 1985) Given that the phone is always accessible and can be used as entertainment to fill idle moments it can be seen as a form of entertainment that the individual can use as they see fit. Autonomy in the psychology of entertainment can be seen in selective exposure theory (Festinger, 1957) and mood management theory (Zillmann, 1988). One construct that can be seen to represent this autonomy in terms of how people manage their moods and leisure or free time through a form of escapism is Social Escapism. Korgaonkar and Wolin (1999) originally used Social Escapism to examine

web usage as a pleasurable pursuit, that allows people to relieve day-to-day boredom and stress. In this context we will examine how the use of smartphone games can fill this role.

### ***The Need for Relatedness***

Given the characteristic of the smartphone as a social device, gaming on a smartphone has inherent advantages over traditional gaming in the fact that it is a more ubiquitous device that is always socially connected. This research seeks to examine whether Social Capital, the resources accumulated through the relationships among people (Coleman, 1988), is an important motivator for people to play games on their smartphone.

P. Vorderer, Hartmann, and Klimmt (2003) identified competition as a major factor in the explanation of video game enjoyment and subsequent usage. Greenberg, Sherry, Lachlan, Lucas, and Holmstrom (2010) came to the conclusion that competition is the most important motive for playing video games and that this fact is what sets video games apart from traditional media. Does competition between smartphone gamers motivate play?

### ***Playfulness***

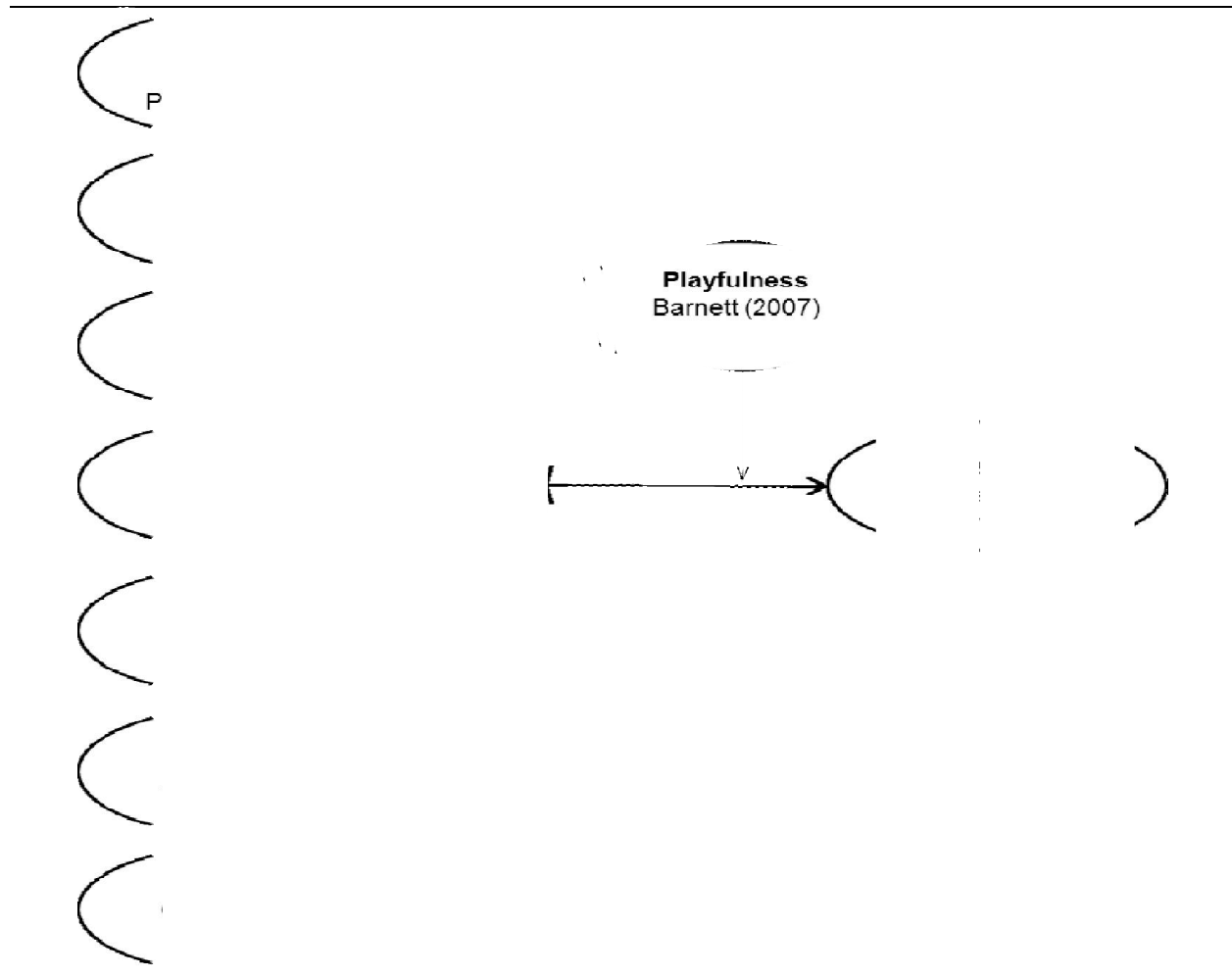
In terms of examining the developmental psychology of play this research proposes to examine the impact of the personality trait of playfulness on the usage of smartphone games. Barnett (2007) developed a Young Adult Playfulness Scale leading to the redefinition of playfulness as “the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humour, and/or entertainment.” (p955) In short, playful people approach various situations in a different way to non-playful people. Qian and Yarnal (2011) found that young adults of a more playful nature are more likely to seek companionship through social leisure and to enhance mood through leisure pursuits while Barnett (2011) identified that playful individuals, perceive and experience leisure pursuits differently, and have different

*motives* and desire different experiences and outcomes from their free time. How exactly these differences will manifest in terms of mobile game usage and the motivations behind usage remains an interesting question that can further influence our understanding of mobile gaming and open an avenue of research that can inform our understanding of mobile usage as a whole.

### **Proposed Conceptual Model**

Based on the preceding theoretical arguments the conceptual model in figure 1 is proposed. An online survey will be conducted and results analysed using Structural Equation Modelling in an approach kin to previous studies of a similar nature(Hsu & Lu, 2004; Nysveen, Pedersen, & Thorbjørnsen, 2005). Results will be analysed through a series of hypotheses that will account for demographic differences amongst the targeted segment of adults who play games on their smartphone.

**Figure 1: Proposed Conceptual Model**



### **Hypotheses**

In order to validate the suggested pathways identified in the conceptual model, seven sets of hypotheses are proposed to identify critical constructs and significant relationships between these variables.

Hypothesis 1: The need for competence has a positive influence on game usage.

Hypothesis 2: The need for autonomy has a positive influence on game usage.

Hypothesis 3: The need for relatedness has a positive influence on game usage.



Hypothesis 4: Flow has a positive influence on game usage.

Hypothesis 5: Social Escapism has a positive influence on game usage.

Hypothesis 6: Social Capital has a positive influence on game usage.

Hypothesis 7: Playfulness has a moderating influence on game usage.

## **Conclusion**

This research seeks to contribute in the consumer behaviour literature by providing a conceptual model to explain the motivations behind consumer's usage of games on their smartphone

Further contributions of this research lie in several domains; The PENS scales are new and can benefit from further construct validation (Przybylski, Rigby, & Ryan, 2010). This research will allow us to deepen our understanding of the modern mobile consumer as mobile games, "their relationship with the devices they inhabit, and the cultures of use emerging around them suggest that we cannot understand contemporary styles of mobility without understanding play" (Wilson, Chesher, Hjorth, & Richardson, 2011, p.354). Given that the Young Adult Playfulness Scale has so far only been tested on college students, extending the scale past these parameters can serve a useful function in further understanding a relatively new avenue of research. Importantly, this research introduces new constructs to be examined in the mobile context. Finally this research will be a major contribution in the consumer behaviour discipline dealing with mobile gaming and this model can serve as a base for further studies to replicate, validate and extend.

## **References**

Barnett, L.A. (2007). The nature of playfulness in young adults. *Personality and individual differences*, 43(4), 949-958.

Barnett, L.A. (2011). How Do Playful People Play? Gendered and Racial Leisure Perspectives, Motives, and Preferences of College Students. *Leisure Sciences*, 33(5), 382-401.

- Coleman, J.S. (1988). Social capital in the creation of human capital. *American journal of sociology*, 95-120.
- Cowley, B., Charles, D., Black, M., & Hickey, R. (2008). Toward an understanding of flow in video games. *Computers in Entertainment (CIE)*, 6(2), 20.
- Csikszentmihalyi, M., & Csikszentmihalyi, I. (1975). *Beyond boredom and anxiety*: Jossey-Bass Publishers San Francisco, CA.
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*: Springer.
- Deterding, S., Dixon, D., & Khaled, R. (2011). Gamification: Toward a definition. *Chi 2011*, 12-15.
- Eccles, J.S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual review of psychology*, 53(1), 109-132.
- Festinger, L. (1957). *A theory of cognitive dissonance*: Stanford Univ Pr.
- Greenberg, B.S., Sherry, J., Lachlan, K., Lucas, K., & Holmstrom, A. (2010). Orientations to video games among gender and age groups. *Simulation & Gaming*, 41(2), 238-259.
- Hjorth, L. (2011). Mobile@ game cultures: The place of urban mobile gaming. *Convergence: The International Journal of Research into New Media Technologies*, 17(4), 357-371.
- Hjorth, L., & Richardson, I. (2009). The waiting game: Complicating notions of (tele) presence and gendered distraction in casual mobile gaming. *Australian Journal of Communication*, 35(7), 23-35.
- Hsu, C.L., & Lu, H.P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, 41(7), 853-868.
- Kallio, K.P., Mäyrä, F., & Kaipainen, K. (2011). At least nine ways to play: approaching gamer mentalities. *Games and Culture*, 6(4), 327-353.
- Korgaonkar, P.K., & Wolin, L.D. (1999). A multivariate analysis of web usage. *Journal of advertising research*, 39(1), 53-68.
- Li, K.A., & Counts, S. (2007). *Exploring social interactions and attributes of casual multiplayer mobile gaming*.
- Mäyrä, F. (2008). Play in the mobile Internet: towards contextual gaming. *A paper presented in the Internet Research*, 9.
- Nysveen, H., Pedersen, P.E., & Thorbjørnsen, H. (2005). Intentions to use mobile services: antecedents and cross-service comparisons. *Journal of the Academy of Marketing Science*, 33(3), 330-346.
- Przybylski, A.K., Rigby, C.S., & Ryan, R.M. (2010). A motivational model of video game engagement. *Review of General Psychology*, 14(2), 154.

- Qian, X.L., & Yarnal, C. (2011). The role of playfulness in the leisure stress-coping process among emerging adults: an SEM analysis. *Leisure/Loisir*, 35(2), 191-209.
- Ryan, R.M., Rigby, C.S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and Emotion*, 30(4), 344-360.
- Vorderer, P., Hartmann, T., & Klimmt, C. (2003). *Explaining the enjoyment of playing video games: the role of competition*.
- Vorderer, Peter., Steen, Francis., & Chan, Elaine. (2006). Motivation In J. Bryant & P. Vorderer (Eds.), *Psychology of Entertainment* (pp. 3-17). London Lawrence Erlbaum Associates
- Wilson, J., Chesher, C., Hjorth, L., & Richardson, I. (2011). Distractedly engaged: Mobile gaming and convergent mobile media. *Convergence: The International Journal of Research into New Media Technologies*, 17(4), 351-355.
- Zillmann, D. (1988). Mood management through communication choices. *American Behavioral Scientist*.

## Appendix

**Table XXXXX .....?**

	Once a month %	Once a week %	Several times a week %	Once a day %	Several Times a day %	Continuously throughout the day %
Smartphone Gamers	4.4	15.9	30.3	17.1	29.1	3.2
Male Gamers	4.1	19.9	32.2	18.1	25.1	0.6
Female Gamers	4.7	11.8	28.4	16.0	33.1	5.9
Generation Y	1	14.6	26.2	22.3	33.0	2.9
Generation X	5.5	15.6	33.9	14.7	27.5	2.8
Baby Boomers	6.3	17.2	30.5	14.8	27.3	3.9
Low Playfulness	4.2	19.5	32.2	16.9	24.6	2.5
Medium Playfulness	4.8	15.2	28.6	17.1	31.4	2.9
High Playfulness	4.3	12.8	29.9	17.1	31.6	4.3
Non Gamers	10	15.7	34.3	18.6	18.6	2.9
Casual Gamers	3.8	17	30.7	16.5	29.7	2.4
Hardcore Gamers	0	12.1	24.1	17.2	39.7	6.9
Single Play	2.7	12.3	30.1	16.0	35.2	3.2
Multi Play	7.4	22.3	30.6	19.0	18.2	2.5