Motivations, experiences and outcomes of playing videogames.

by

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ABSTRACT

The current research examined gaming within a leisure context to examine the motivational and experiential value of the activity, to better understand the range of outcomes of playing videogames. Flow theory was used as a theoretical framework for examining positive gaming experiences, and how these were associated with gaming motivations, and potential positive psychological and affective outcomes. The research utilised a mixed-methodological approach with samples of gamers. These included focus groups, an experiment and online questionnaires. The findings showed that immersion and achievement-orientated gaming motivations predicted flow in gaming, and could also predict some dimensions of psychological well-being. Flow in gameplay interacted with increases in positive mood and activation. This suggests that the processes involved in gaming are influential to positive gaming outcomes. Specific game aspects were influential to the nature of gaming experiences, although these were largely dependent on game-type. The findings also showed that social gaming contexts were influential towards gaming experiences, and the associated affective outcomes. This suggests the dynamic nature of gaming experiences, and the importance of acknowledging the wider social contexts in which gaming occurs. Aspects of personality (i.e. trait aggression and competitiveness) influenced negative mood after gameplay, suggesting the importance of considering internal factors when examining gaming outcomes. Further, because gaming motivations, experiences and the associated effects were largely individual and game-specific, this highlights the need for future research to adopt more idiographic approaches. Based on the findings, the research presents a Process Model of Gameplay to examine the dynamic nature of gameplay processes for a range of outcomes. The current research highlights the effectiveness of considering gaming within the wider context of leisure, to identify gaming processes as a way of examining the influence of gaming motivations and experiences on positive outcomes of the activity.

TABLE OF CONTENTS

LIST OF TABLES

5

LIST OF FIGURES

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From undertaking a PhD, I have learnt that it is the support of colleagues, family, friends and loved ones which can ultimately determine your success. A PhD can be a very lonely endeavour, where you are the captain of your own thoughts and ideas, navigating through a world where there is no map to follow. Because of this very personal and lonely experience, the social support of others is vital. Without this, you would not only be navigating without a map, but also without a ship to keep you afloat.

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"A person who learns to flow with confidence wherever he or she is becomes both truly autonomous and truly connected with the world." (Csikszentmihalyi, 1975; pp. 206)

Glossary

Animal Crossing A game developed by *Nintendo*, released in 2004. This is a simulation game in real-time, in which players live in a colourful town, meet other characters and are provided with a wide range of things to do. (e.g., go fishing, decorate the house).

Big Brain Academy A series of mini games, released in 2006, which are designed to stimulate the brain. Exercises involve thinking, memory, computation, analysis and identification. These games are usually played on the *Nintendo DS*.

BioShock. A horror first-person shooter game, developed by Irrational Games and first released in 2007. Players explore an underwater city called Rapture, whilst avoiding attacks of its terrifying inhabitants.

Browser games Games which are played via Internet browsers. They are distinct from other games as they do not require additional installation of games software.

Cafe World A social game created by Zynga, in which players are required to run their own restaurant. Players choose, prepare and cook their own dishes to aim for success in the culinary world. Players can visit other players' restaurants to sample their dishes and to potential recruit chefs for their own restaurant

Clans Groups of players who play online games together.

Dance Dance Revolution A music videogame created by Konami, in which players stand on a dance platform and follow coloured arrows with their feet in time with musical and visual cues.

Doom Traditionally seen as the first of its kind, developed in 1993 by id Software. This is a first-person shooter genre, initialising the use of 3D graphics and multiplayer options.

Duke Nukem. This is a First Person Shooter game, developed by 3D Realms, and released in 1996. Players adopt the role of Duke, and experience a variety of adventures, including journeying to space to kill an evil alien.

ERP ERPs are detections of electrical activity in the electroencephalogram (EEG) reflecting the engagement of the brain in a variety of information processing activities (Bartholow et al., 2006; Fabiani, Gratton & Coles, 2000).

Everquest A fantasy-based Massively Multi-player online role-playing game, released in 1999, developed by *Sony's* 989 Studios.

Farmville A real-time farm simulation game, developed by Zynga, most commonly played via the social networking site Facebook. Players are required to run a virtual farm by planting, growing and harvesting virtual crops and trees, as well as raising livestock.

First Person Shooter. A game genre in which gameplay is centred around a weapon-based combat through the first person perspective. That is, players experience the game through the eyes of the protagonist.

Forza MotorSport a racing game, developed by Turn 10 Studios, and released in 2005

Full Spectrum Command A training game, released in 2003. This game has been used in Army training schools for the development of cognitive skills.

Full Spectrum Warrior A real-time tactics game, developed by Institute for Creative Technologies, and first released in 2004. This game has been modified for use to assist war veterans to overcome the effects of post-traumatic stress disorder.

Glider PRO. This game was published by Casady and Greene in 1991. The main game objective is to navigate a paper aeroplane through a house, whilst avoiding an array of obstacles (e.g., furniture, the floor, dripping water). During this venture, the player has to collect hidden magic stars.

Half Life 2 A science-fiction first-person shooter game, developed by Valve Corporation and released in 2004. The game is set in a dystopia in which the scientist Gordon Freeman must survive attacks of its inhabitants.

Halo 3 A first-person shooter game, developed by Bungie, first released in 2007. The game is set in the 26th century in which players assume the role of the Master Chief, to help defend humanity.

Little Big Planet A puzzle game, centred around user-generated content.

Microsoft Xbox 360 A seventh generation videogame console which integrates *Xbox Live*, allowing players to play online.

Multi-user environments An operating system or application software which allows concurrent access by multiple users of a computer

Massively Multiplayer Online Role-Playing Games (MMORPGs) Role-playing games in which a very large number of players interact with one another within a virtual game world.

Mortal Kombat. These are a series of Fighter games, created by Boon and Tobias, and first released in 1992. Players take part in martial arts tournaments, and play for victory.

Nintendo DS A handheld game console, released in 2004.

Nintendo GameCube A sixth generation console, which uses mini-disks rather than standard-sized DVD disks.

Nintendo Wii A seventh generation games console, characterised by its wireless controller (*Wii Remote*) which can be used as a pointing device to interact with the visual on-screen image.

Nintendo Wii Fit A games console which was originally developed to include a *Wii Balance Board*, motivating players to get up and get moving towards a healthier lifestyle. The games played on the *Wii Fit* include a variety of different exercises to provide players with a custom-built workout.

Nintendo Wii Sports Resort A series of active- play games including archery, cycling, table tennis and bowling, which are played on the *Nintendo Wii* console.

Online gaming a form of gaming in which players play games over some type of computer network (e.g., Internet).

P300 component A waveform in the electroencephalogram which is related to the attentional and working memory demands of a task.

PacMan An arcade game, developed by Namco, first released in 1980.

Role-playing games. Games which involve players assuming the role of characters in a fictional setting .

Sony PlayStation. A seventh generation console, first introduced in 1994. It's successors include the *PlayStation 2* and *PlayStation 3*.

Sony PlayStation EyeToy. The *EyeToy* is an accessory which accompanies the *PlayStation 2*. It is a colour digital camera device which uses computer vision and gesture recognition, and allows players to interact with games through motion and sound.

Sony PlayStation PSP. A handheld console, released in 2005.

Videogames The term "videogame" is used as a generic term to include all electronic games which can be played in arcades, on game consoles, hand-held consoles, PCs, and over the Internet.

CHAPTER 1: INTRODUCTION

1.1. Background

Since the latter part of the 20th Century, videogames have become a major source of entertainment for a wide range of individuals. Figures show that within the last 10 years, over 25 million gaming devices and more than 335 million computer and videogames have been sold in the UK (ELSPA, 2008). The combined video and computer game sales in the USA in 2009 was over 10.5 billion dollars and that 67% of American households own some form of videogame entertainment hardware (ESA, 2010). At the end of last year, figures show that 84.64 million *Nintendo Wii* consoles were sold worldwide, with *Microsoft's Xbox 360* and *Sony PlayStation 3* each approximating at 50 million in sales (Sony Computer Entertainment, 2011).

Games can be played on a range of different platforms including computers, consoles (*Microsoft Xbox 360, Nintendo Wii, Sony PlayStation*), handheld consoles (*Sony PSP, Nintendo DS*), iPods, and mobiles telephones. A recent survey revealed that among males, playing videogames was ranked the favourite leisure activity for those aged 12 to 24, and third highest for those aged 25 to 44 (Vorhaus, 2008). The increasing popularity of this activity has raised a number of concerns with parents, teachers, politicians and the media about their potential negative effects on attitudes and behaviour.

Concerns over the potential negative consequences of violent game exposure is reflected in media coverage of school shootings where the actions of perpetrators have been proposed to be linked to excessive violent videogame play. The Virginia Tech Massacre in April 2007, the Columbine High School in April 1999, and the more recent case of the German shootings in Kretschmer on 11th March 2009 are examples of cases which have contrived to generate such debate. On closer examination, however, it becomes clear that in many of these cases, the perpetrator(s) had no access to violent videogames (Carlisle & Hunt, 2007; Ferguson, 2008). Ferguson (2008) reviewed the associated case evidence and concluded that there is minimal evidence in support of the hypothesis that excessive exposure to violent videogames play a key role in the instigation of school shootings. This suggests a distinction between public debate and the empirical evidence of the link between violent videogame exposure and these acts of violence.

Recent case studies on the perpetrators of school shootings provide evidence of psychopathic tendencies (Langman, 2009), depressive, suicidal tendencies and subjection to peer victimisation as key risk factors (Wike & Fraser, 2009). This suggests a much more complex mechanism behind school shooting behaviours. It also suggests that the proposed link between violent videogames and violent acts should consider the influence of the personality (e.g., aggressive personality, preference for violence) and situational contexts in which these events occur. Violent acts rarely occur as a result of a single cause. Multiple factors such as peer victimisation, involvement in crime and parental violence are all much higher risk factors for violence than that of exposure to media violence (Hopf, Huber & Weiß, 2008). When considering perpetration of homicide, evidence has shown potential indicators to range from previous criminal records, psychiatric disorders, adverse socialisation experiences, maladaptive coping strategies and social-economic stressors (Krahé, 2001).This evidence suggests that the wider context should be considered, to understand the range of influences on aggressive behaviour. The proposed link between exposure to media violence and violent criminal behaviour therefore requires further consideration and acknowledgement of these issues, particularly given that a large majority of videogame research is experimental, and attempts to establish causal links between exposure to videogame violence and aggressive thoughts, feelings and behaviour (Anderson, Carnagey, Flanagan, Benjamin, Eubanks & Valentine, 2004).

The issue of direct causality was recently examined within the Byron Review (Byron, 2008). This was a Government initiative in response to the concerns over the effects of new technologies, including videogames, on children and young people. Following an extensive review of the available literature, the review summarised that the evidence for negative effects of new media was weak and inconclusive, and potential negative effects are less dominant than they are assumed to be. It was recommended that the influence of media should be considered within the wider context of people's lives, in contrast to "cause and effect" as is the tradition of much psychological gaming research (e.g., Anderson & Huesmann, 2003). Further the to issues outlined in the review, acknowledging the social contexts of gaming, gaming motivations and experiences would also provide useful indicators to help develop a more valid and comprehensive theoretical framework for examining the potential positive and

negative outcomes of gaming. Utilising a leisure theory approach can provide a useful way of integrating these factors, in order to understand the more positive experiences and outcomes of the activity.

Leisure activities are characterised as being freely chosen, intrinsically motivated and in which engagement is largely autonomous (Neulinger, 1981). People engage in leisure activities for numerous reasons, including: escape from everyday stresses, to pass the time or to develop new skills (Iso-Ahola, 1989). Gaming follows similar patterns, which suggests it should be examined using a leisure theory framework. A useful framework is "flow theory" (Csikszentmihalyi, 1975). Flow can be characterised as a positive psychological sense of enjoyment which is promoted through an individual's intrinsic motivation for a particular activity. A key assumption of the theory is that the individual undertakes an activity purely for its own sake, and the associated experience is sufficiently intrinsically rewarding to promote continued behaviour in the absence of other rewards (Csikszentmihalyi, 1975; 1993).

Utilising flow theory in studying gaming is useful as it can provide an examination of the potential positive experiences derived through gaming, how these are associated with motivations for playing videogames, and their influence on potential positive outcomes. To date, there has been little published examination of the potential of gaming motivations and experiences to have positive psychological and affective outcomes. Some research has drawn together motivational and experiential factors associated with gaming. Positive experiences such as flow and enjoyment in gaming have been found to be associated with intention to continue play, satisfaction in gaming and gaming loyalty (Choi & Kim, 2004; Hsu & Lu, 2004; Koo, 2009). This research, however, does not identify specific types of motivations, how they can determine experiences of flow in gaming, and their influence on outcomes. Using the experiential flow framework (Csikszentmihalyi, 1975) can provide a process approach to examine these links, in contrast to a large majority of gaming research which focuses too closely on the outcomes of gaming. Since flow was been shown to be associated with positive outcomes, including positive affect and psychological well-being (Ellis, Voelkl, & Morris, 1994; Haworth & Hill, 1992), it seems reasonable to assume that this holds true within the context of gaming. These observations build the rationale and inform the objectives for the current research.

Leisure theory has also identified the positive influence of social opportunities which some leisure activities can provide (Iwasaki and Mannell, 2000). Engaging in social interactions and sharing a common activity with others can enhance feelings of social belonging, which have been shown to be associated with health and well-being (Caldwell & Smith, 1988). The development of social gaming (e.g., online gaming, multi-player functions) provides gamers with many opportunities to engage in social play with others. Interacting with others during gameplay can potentially enhance gamers' feelings of social belonging and hold equivalent benefits as other leisure pursuits. These social opportunities can also potentially influence highly enjoyable gaming experiences, which are likely to be associated with positive feelings after playing. No published research to date, however, has examined the differences between solo and social gaming contexts for gaming experiences and positive affective outcomes in real-life gaming contexts. Social gameplay is conceptualised as any form of gameplay in which a player plays either online or offline with others, cooperatively or competitively. Solo play, otherwise known as single-player gaming, is characterised as a player playing alone. Understanding the experiences and associated outcomes of these two distinct types of gaming would provide useful insight into the way in which social contexts influence gameplay, and potentially support the importance of acknowledging wider contexts of gaming. Given this limitation, this further informed the rationale of the current research.

In summary, the current research aimed to use flow theory as a theoretical framework to examine its utility within the context of gaming. Specific objectives of the research programme were to examine: a) The influence of gaming motivations on experiences of flow, and their combined influence on psychological well-being. b) The influence of flow, aggressive personality and competitiveness on mood, in relation to both real-life and experimental gaming contexts. c) The differences in flow and post-gameplay mood between solo and social gaming experiences.

1.2. Overview of the thesis

The thesis consists of eight chapters, including this one which develop in a linear trend. Chapter 2 presents an integrative literature review of gaming and leisure

research perspectives to provide the context for the described programme of current research.

Chapter 3 describes and evaluates the methodology used in the programme of research. It highlights the basis of the methodologies used in a critical review of previous research and includes an examination of different methodological approaches for addressing different research questions, and presents a rationale for the methods used in the current research.

Chapter 4 presents the first empirical study of the research programme. This was an Internet-based questionnaire, examining gaming motivations and experiences, and their combined influence on psychological well-being of gamers. The results suggested that achievement and immersion-oriented gaming motivations predicted flow in gaming, whereas social ones did not. Further, achievement motivations were highly predictive of the different dimensions of psychological well-being, suggesting that the intrinsic drive for gaming has wider psychological implications than previously documented.

Chapter 5 presents the second empirical chapter of the thesis. This used an experimental design to examine specific gameplay experiences and outcomes. It aimed to explore the extent to which flow influenced mood change from pre to post test. It also aimed to examine whether this differed between games with varying levels of violent content. It also aimed to examine the influence of aggressive personality on gaming experiences and outcomes. The results showed that flow interacted with improvements to positive mood and activation, and reductions in deactivation, between pre and post gaming tests. Flow was associated with some dimensions of psychological well-being, and aggressive personality did not interact with any affective outcomes.

Chapter 6 presents the third empirical study. This consisted of a series of focus groups with samples of regular gamers, and aimed to examine the diversity of gaming motivations, meanings and experiences, as well as gamers' attitudes about the importance of violent game content. The results showed that motivations were largely dependent on individual factors and game genre, and that gaming experiences were

influenced by game aspects, such as social dynamics and contexts. The importance of violent content was largely dependent on the type of game, and was often seen as being present as a product of competitiveness and a means of completing game objectives.

Chapter 7 presents the fourth empirical study. This was an Internet-based questionnaire examining differences between solo and social gaming experiences in their influence on flow and mood. Further, to examine the differences between gaming contexts and types of gameplay on gaming experiences and outcomes of real-life gaming experiences. The influence of trait competiveness and aggression on gaming experiences and outcomes was also examined. The results showed that flow influenced positive mood in both solo and social gaming, and that positive mood was higher after social compared to solo gaming. No differences in flow or post-gameplay mood were found between different gaming contexts and gameplay types. The findings also showed the influence of competitiveness and aggression on negative mood in social gaming contexts.

Chapter 8 presents the General Discussion and Conclusions of the thesis, future work, limitations and original contributions of this work to the wider literature.

CHAPTER 2: LITERATURE REVIEW

Introduction

The aim of this chapter is to provide an integrative review of two different research literatures to provide the context for the current research on the motivations, experiences and outcomes of playing videogames presented in the thesis. The first section reviews the research examining the effects of playing videogames, with particular reference to the influence of violent game content and amount of time spent gaming. The following sections review the literature on the positive effects of gaming, including a review of the contexts in which gaming takes place. This is followed by a review of the influence of mechanical and structural game characteristics for developing cognitive skills, promoting physical activity, and leads onto more general evidence of the benefits for enjoyment and well-being. This logically progresses onto an examination of gaming within a leisure context, and evidence demonstrating the benefits of engaging in leisure activities. The concept of flow is then introduced as a theoretical framework for examining the motivational and experiential aspects of playing videogames. The chapter concludes by examining the literature on specific gaming motivations, and outlines the aims of the research programme.

2.1. Harmful effects of playing videogames

The increasing popularity of videogames has led to various societal concerns about excessive gameplay, desensitisation to real world violence, and their harmful effects on aggressive attitudes and behaviour (Anderson & Bushman, 2001; Bartholow, Bushman & Sestir, 2006; Carnagey, Anderson & Bushman, 2007; Chappell, Eatough, Davies & Griffiths, 2006; Gentile, 2009; Grüsser, Thalemann & Griffiths, 2007). Excessive gameplay has been studied in relation to displacement of other activities, such as engagement in physical activity (Ho & Lee, 2001), and academic work (Gentile, Lynch, Linder & Walsh, 2004; Harris & Williams, 1985; Ogletree & Drake, 2007). Such research suggests that time spent playing videogames predicts poorer school performance and greater attention problems in adolescents (Gentile, 2009; Gentile, et al., 2004).

Concerns about the amount of time spent gaming is also related to research on gaming addiction (Gentile, 2009; Griffiths & Hunt, 1995, 1998; Hsu, Wen & Wu, 2009).

Gentile (2009) and Griffiths and Hunt (1998) found that approximately 8% and 15% of adolescents respectively displayed videogame "dependence" and pathological patterns of play (using adapted versions of the DSM-III-R and DSM IV criteria for pathological gambling). More recent research demonstrated associations between excessive online gaming and psychological and behavioural dependence, measured by an adapted version of an exercise addiction scale (Hussain & Griffiths, 2009). However, applying measures of pathological gambling and exercise addiction to gaming behaviour is questionable and makes it difficult to interpret these findings as there is a lack of associated theoretical framework. Gambling, for example, is qualitatively different from gaming due to the different financial investment, contexts, motivations and experiences which the two activities provide.

A recent critique of the addiction paradigm by Wood (2008) suggests that the concept of videogame addiction is invalid and its application to gamers is unjustified. It has been suggested that excessive videogame play may reflect poor time management strategies, and be a way of avoiding more serious underlying problems. This suggests that excessive gameplay is not necessarily equated with addiction *per se*. Instead, there are proposed positive consequences for increased self-esteem and the escape of everyday stressors (Griffiths, 2007).

Recent evidence also challenges the notion of gaming addiction and the associated implications of "problem video game playing" (Hart et al., 2009; Wood, 2008). Hart et al. (2009) found no link between excessive videogame play and engagement in social activities or academic success in adolescents and adults. This suggests minimal detrimental effects of gameplay on aspects of daily life, and that the theoretical underpinnings of addiction have not been established in the context of gaming, making it difficult to apply previously validated models (e.g., gambling addition) (Charlton & Danforth, 2007). Adopting an approach which integrates time spent playing videogames, in relation to other activities, whilst also accounting for gaming motivations could provide a more useful framework for examining gaming habits. This could further identify why gamers spend time gaming, and suggest that they play for the positive experiences and opportunities for escapism which can be derived though the activity.

2.1.1. Violent game content

In addition to excessive gaming, many researchers perceive violent game content as a particular concern given the popularity and increasing availability of violent videogames in the commercial market. Research has found that level of violent content in top-selling videogames ranges from 64 to 89 per cent (Children Now, 2001; Thompson & Haninger, 2001). A key concern for researchers is the influence of violent game content on aggression-related outcomes, and desensitisation to real-life violence (Anderson et al., 2004; Carnagey et al., 2007). This research has been developed from the research tradition on violence in the media (e.g., film and TV) (Huesmann, Moise-Titus, Podolski & Eron, 2003), and examines the influence of exposure to media violence on aggressive attitudes and behaviour. Many researchers have adopted this perspective to theorise and study the potential aggressive effects of playing violent videogames (e.g., Gentile & Anderson, 2003; Hopf et al., 2008). Much of this research has been experimental and has attempted to find a causal link between exposure to videogame violence and aggressive thoughts (Calvert & Tan, 1994; Markey & Scherer, 2009), feelings (Persky & Blascovich, 2008), and behaviour (Anderson, 2002; Anderson et al., 2004; Anderson & Dill, 2000; Arriaga, Esteves, Carneiro & Monteiro, 2008; Bartholow & Anderson, 2002; Carnagey et al, 2007).

The short and long-term influences of violent content on aggressive attitudes and behaviour have been explained using a variety of different theoretical models. These models include: Social Learning Theory (Bandura, 1977); Cognitive Neoassociation Model (Berkowitz, 1989); Script Theory (Huesmann, 1986); Excitation Transfer Theory (Zillmann, 1983), and the General Aggression Model (Anderson & Bushman, 2002b; Anderson & Carnagey, 2004; Anderson & Dill, 2000; Anderson & Huesmann, 2003). These all examine the influences of violent content on internal knowledge structures, and the reinforcement of accessibility of violent-related attitudes and behaviours. These models are discussed in the following section.

Conceptual Models

Social Learning Theory: Social Learning Theory posits that individuals acquire responses through direct experience or observation of a social behaviour (Bandura, 1977b; Bandura, Ross & Ross, 1963). This framework predicts that through observing an act of aggression or violence, individuals learn to respond in an aggressive way. It

incorporates the influence of beliefs and expectations on behaviour which determines how an individual behaves in wider social contexts. Research has demonstrated that a range of aggressive models (e.g., TV characters) can influence aggressive imitation (Bandura, 1983; Baron & Richardson, 1994; Berkowitz, 1993a). In addition, Castle and Hensley (2002) explored the way in which serial killers learn to reinforce violence and aggression in military camps, and Mihalic and Elliott (1997) found that exposure to violence in childhood and adolescence was a predictor of marital violence.

Cognitive Neoassociation Model: The cognitive neoassociation model explains the influence of aversive events (e.g., hot temperatures and frustration) on negative affect (Berkowitz, 1989, 1990). This arouses cognitions, physiological responses and motor reactions which are consistent with fight or flight responses. The feeling of anger is associated with the fight response, whereas fear is the dominant reaction motivating the flight response. The model explains how cues which are present during aversive events become associated with the event itself, and the subsequent emotional and cognitive responses activated by that event. This can explain why aversive events, such as frustration, lead to aggressive behaviour via the negative affect mechanism (Berkowitz, 1989). Research by Rule, Taylor and Dobbs (1987) offers support for this theory by demonstrating that participants in uncomfortable conditions were more likely to access anger-related thoughts compared with those in comfortable conditions. This supports Berkowitz's (1990) proposition that negative affect leads to the activation of related feelings and cognitions.

Script Theory: Scripts are conceptualised as templates for defining situations and guiding behaviour developed by learning, internalisation and application (Huesmann, 1986; 1998). The more a script is rehearsed, the stronger it will be in determining the way in which an individual perceives and behaves in a particular situation (Abelson, 1981). The theory assumes that the more an individual observes violence or aggression, the more this script becomes accessible and is utilised across a range of situations. Activation of these knowledge structures may become automatic and are strengthened by repeated exposure. Empirical evidence in support of this framework includes research examining the influence of aggressive cues (e.g., weapons) on aggressive thoughts, measured by faster recognition of aggressive target words in word recognition tasks (Anderson, Benjamin and Bartholow, 1998).

21

Excitation Transfer Theory: This theory suggests that physiological arousal in response to a specific event dissipates slowly (Zillmann, 1983). If a second event commences within a short time of the first event, persisting levels of arousal may be misattributed to the second event. If the second event is associated with anger, the individual considers themselves to be more angry, which can result in a self-fulfilling prophecy. Research examining excitation transfer theory was conducted by Taylor, O'Neal, Langley, and Butcher (1990) who found increased aggressive responses in conditions where arousal was generated following the administration of a caffeine drug. They concluded that the persistent arousal influenced subsequent aggressive outcomes.

Desensitisation Theory: As well as the socio-cognitive models previously discussed, desensitisation theory has been applied to media violence research as a means of explaining how repeated exposure to violence may be linked to aggressive outcomes. A number of recent studies have documented how exposure to videogame violence may reduce sensitivity to real life violence (Bartholow et al., 2005, 2006; Carnagey et al., 2007; Staude-Müller, Bliesener & Luthman, 2008).

Studies have typically utilised physiological measures (e.g., heart-rate, respiration, systolic blood pressure, galvanic skin response) as a means of monitoring physiological arousal during gaming, and this has been used as evidence of emotional reactions to violent experimental stimuli (Staude-Müller et al., 2008). Other studies have used the amplitudes of the P300 component of event-related brain potential (ERP) as a way of examining physiological responses to violence (Bartholow et al., 2006). Bartholow et al's (2006) findings showed associations between high exposure to violent videogames and low amplitude of the P300 which predicted increases in later aggression, suggesting that violent content exposure is related to desensitisation to violence. These studies suggest that exposure to violent content in videogames decreases physiological sensitivity to violence, and influences subsequent attitudes and behaviours that are more accepting of violence.

General Aggression Model and General Learning Model: The General Aggression Model or GAM (Anderson & Bushman, 2002b; Anderson & Dill, 2000; Anderson &

Huesmann, 2003) draws together the existing socio-cognitive models explaining the effects of media violence on aggression-related outcomes. More recently, Buckley and Anderson (2006) proposed the General Learning Model (GLM) to incorporate more modern social-cognitive models and developmental approaches. The GLM was developed as a way of explaining the way in which videogames teach (e.g., factual learning, learning behaviours), influence personality and guide behaviour.

These models account for both the person and situation as input variables for the learning of aggressive responses. Personal variables include the individual's beliefs, attitudes and previous experiences. Situational variables include the influence of media, provocation or other aggressive cues within a particular situation. The way in which these two types of input variables interact influences the individual's internal state and hence determines the way in which they learn to respond aggressively (cognition, affect and arousal) (Anderson & Bushman, 2002b).

The main assumption of the models is that recent exposure to violent media causes a short-term increase in aggression through influencing the individual's internal cognitive, affective and arousal states. Examples of cognitions include behavioural scripts, beliefs and attributions. Affective states include mood or emotion, such as anger. These three routes interact with each other and result in the observed behaviour. For example; cognition and arousal influence affect (Schachter & Singer, 1962), and affect influences cognition and arousal (Bower, 1978).

The General Aggression Model predicts that engaging with violent media (e.g., playing a violent videogame) primes aggressive cognitions (e.g., scripts) which produces an aggressive affective state (e.g., anger), and increases arousal. The long-term effects of such processes are said to occur through the way knowledge structures develop via learning processes. Each instance of playing a violent videogame acts as a single learning trial, and over time, creates a repeated pattern of responses which become increasingly accessible to the individual. This is hypothesised to cause the individual to become more aggressive in responding to the environment. Support for the GAM has been provided by a number of studies on aggressive effects of violent videogames (Anderson & Bushman, 2001; Anderson & Carnagey, 2009; Bushman & Anderson, 2002), and has also recently been used to explain the effects of exposure to

prosocial media on increasing prosocial thoughts, feelings and behaviours (Greitemeyer, 2009; Greitemeyer & Osswald, 2010). The following section provides a review of the literature examining the influence of violent game content on aggression-related outcomes (i.e., thoughts, feelings and behaviour), and then explores other variables which have been shown to moderate this link.

2.1.2. Aggressive thoughts/attitudes

Numerous studies have examined the role of violent videogame exposure on aggressive cognitions (Anderson & Dill, 2000; Anderson, Gentile & Buckley 2007; Giumetti & Markey, 2007; Uhlmann & Swanson, 2004). The majority of this research is experimental and compares participants playing violent and non-violent games on measures of aggressive cognitions, often using word completion tasks as dependent variables (Anderson, Carnagey & Eubanks, 2003). For example, Anderson and Dill (2000) showed that participants had greater accessibility to aggressive cognitions, following violent videogame-play as measured by the Reading Reaction Time test (Anderson, 1997; Anderson, Anderson & Dueser, 1996; Anderson, Benjamin & Bartholow, 1998), compared with the non-violent game condition. Similarly, Uhlmann and Swanson (2004) found that participants in the violent game condition responded to aggressive stimuli in the Implicit Association Test (Greenwald, Banaji, Rudman, Farnham, Nosek & Mellott, 2002) more quickly than those in a non-violent game condition, suggesting that these results show automatic learning of aggressive attitudes resulting from exposure to violent game content.

Giumetti and Markey (2007) showed that participants in violent game conditions responded more aggressively to ambiguous story-stems than those in non-violent game conditions. Additional cross-sectional evidence from Anderson, Gentile and Buckley (2007) demonstrated that children's violent videogame exposure is correlated with positive attitudes towards violence in war and aggressive beliefs. It is conceivable, however, that children with higher trait aggressiveness and pro-violence beliefs would be drawn to games with high levels of violence, compared with children who were lower in pro-violent attitudes. A further noteworthy issue which implies caution when interpreting the findings of the studies outlined above, is that aggressive cognitions do not necessarily transfer into real-life aggressive behaviour. No empirical evidence is available to confirm this issue, but it should be acknowledged

when considering the influence of such research to societal speculations on the negative effects of violent gameplay on real-life acts of aggression. These research findings should not be used as evidence that playing violent videogames has negative influences on behaviour, rather, just on cognitions.

2.1.3. Aggressive Feelings

Numerous experimental studies have demonstrated a link between exposure to violent game content and aggressive feelings (e.g., Anderson & Ford, 1986; Carnagey & Anderson, 2005; Persky & Blascovich, 2008; Williams & Clippinger, 2002). Carnagey and Anderson (2005) measured aggressive affect following exposure to conditions of violent and non-violent videogame play. They found that participants in violent videogame conditions were significantly more hostile than those in non-violent conditions.

Persky and Blascovich (2008) examined videogame immersion and its influence on aggressive feelings and behaviours. The study compared the differing effects of gameplay on a desktop platform (DTP) with that of using Immersive Virtual Environment Technology (IVET). They found that presence in the game, as a product of the type of game platform, mediated the relationship between play and aggressive feelings. This study, however, was limited in several ways. Firstly, aggressive feelings were measured by an experimenter-created one-item measure ("playing the game made me feel more aggressive"). Secondly, the simplicity of the game used and the limited period of gameplay are somewhat limited. That is, it is likely that the effects observed could be accounted for by frustration and boredom resulting from limited intensity of the game, since the game used was designed for the purposes of experimental research, and was highly simplistic, with no changes to the game environment. The methodological shortcomings of this study make it difficult to determine the size of causal effects of game platform on aggressive affect. The findings do suggest, however, that technological aspects of gaming are important determinants of the nature of gaming experiences and associated outcomes. This has implications for future experimental gaming studies, as it suggests the need to use appropriate gaming technology to accurately represent ecologically valid gaming experiences. This is highlighted by research by Ivory and Magee (2009) who showed

lower physiological arousal in participants who played a videogame on a portable console device compared with those who played on a television-based one.

2.1.4. Aggressive Behaviour

Anderson and Bushman's (2001) meta-analysis of research on the effects of videogames provides substantial empirical evidence that violent game content exposure increases aggressive behaviour in both children and adults (N = 3033, r_+ = .19), as well as increasing aggression-related thoughts (N = 1495, r_+ = .27), feelings (N = 1151, r_+ = .18), and physiological arousal (N = 395, r_+ = .22). More recent meta-analysis, including both Eastern (Japan, China, Singapore) and Western (U.S) populations, supported these findings, although observed marginally smaller effect sizes for the outcomes variables (Anderson et al., 2010). Greater aggressive behaviour has also been observed in cross-sectional and longitudinal studies of real-life gaming habits, and in experimental studies following exposure to violent compared with non-violent videogames (Arriaga et al., 2008; Bartholow & Anderson, 2002). For example, experimental research by Bartholow and Anderson (2002) found evidence of higher levels of aggressive behaviour (as measured by a retaliation reaction time test) in participants who played in a violent compared to a non-violent condition. Further evidence to support this finding is provided by Arriaga et al. (2008) who revealed that exposure to violent game content significantly predicted aggressive behaviour (as measured by a competitive reaction time task), and that state hostility was indirectly related to effects on aggression.

Longitudinal evidence by Möller and Krahé (2009) has revealed that exposure to violent videogames significantly predicts later physical aggression via increasing aggressive norms and the hostile attribution bias. Anderson et al. (2008) found similar findings in children in Japan and the United States, where habitual gameplay was found to significantly predict later physical aggression, as measured by self-report, peer and teaching ratings of physical aggression within the last month. These studies provide insight into influences for real-life aggressive behaviour, which is lacking within experimental research.

These findings provide support for the influence of violent game exposure on aggression-related outcomes, but there are a number of key criticisms of such claims

which relate to the theoretical assumptions and methodological limitations of the research included in the analyses. These will be discussed in the following section.

2.2 Key concerns: Moderators, methods and models

One particular concern with recent meta-analytic research (Anderson & Bushman, 2001; Anderson et al., 2010) is that they do not sufficiently account for "third variables" (e.g., family violence and trait aggressiveness) which may mediate the relationship between violent game exposure and aggression (Ferguson et al., 2008a; Ferguson, 2009). Similarly, correlational studies of the relationship between violent game content and aggression also often fail to consider the influence of such factors. However, a recent longitudinal study examining general media violence (including videogames) and youth violence did account for a range of "risk factors" in demonstrating the correlations between violent beliefs and behaviour (Hopf et al., 2008). Among these risk factors were experiences of aggressive feelings and parental physical violence which were positively correlated with delinquent behaviour. Further evidence has shown that associations with delinquent peers and depressed mood are the strongest predictors of children's self-reported aggressive behaviour (Ferguson, Miguel & Hartley, 2009). Additionally, recent correlational and longitudinal evidence has found that poor parent-child communication moderates the link between exposure to videogame violence and direct aggression in young adolescents (Wallenius & Punamäki, 2008; Wallenius, Punamäki & Rimpelä, 2007). These studies however are focused on developments of aggressive responses in childhood and adolescence. It remains unclear whether these associations would be equivalent in adults.

Personality factors and individual characteristics have also been examined as potential moderators in the proposed relationship between violent game exposure and aggression-related outcomes (Krahé & Möller, 2004; Markey & Scherer, 2009). Personality traits such as psychoticism, empathy, sensation-seeking, preference for violence and hostility have all been examined in relation to the proposed link between violent media, aggressive attitudes and behaviour (Bartholow et al., 2005; Krahé & Möller, 2004). Gentile et al. (2004) examined the mediating role of trait hostility on the link between violent videogame exposure and aggressiveness in adolescents. Their findings showed that those adolescents with high hostility were more likely to show

aggressive responses than those with lower hostility following exposure to violent videogames.

A more recent study has examined psychotic personality as a moderator between violent gameplay and aggressive thoughts (Markey & Scherer, 2009).The experiment took pre-test measures of psychoticism, which was followed by a period of gameplay in one of two conditions (violent or non-violent game), and post-test measures of hostility and aggressive cognitions. Higher levels of reported psychoticism were found to be more strongly associated with negative outcomes for aggressive thoughts and hostility compared to those with lower levels of psychoticism. Similarly, Bartholow et al. (2005) demonstrated that trait hostility and empathy could partially account for the effects of violent videogame exposure on aggressive behaviours.

Several other moderating variables have been examined in the literature, including exposure to aggressive TV content (Linder & Gentile, 2009), preferences for violence (Krahé & Möller, 2004) and preference for violent videogames (Wiegman & Van Schie, 1998). In examining general media violence, Linder and Gentile (2009) assessed the link between exposure to indirect, verbal and physical aggression on TV and aggressive behaviour in girls aged ten and eleven. After listing their favourite TV programmes, the researchers coded the participants' listings for aggression-related instances. Exposure to physical, verbal and rewarded indirect aggression was found to be associated with higher aggression and lower prosocial behaviour, based on teachers' ratings of these behaviours.

These studies present a case for examining the wider individual, social and cultural factors, rather than a specific individual focus on the influence of media violence on aggressive attitudes and behaviour. These findings suggest that the link between exposure to media violence and aggression-related outcomes is highly complex. It implies that a wider theoretical framework is required to better examine the influence of personality variables and gaming preferences (e.g., for violent content) on the experiences and outcomes of playing videogames. Therefore, examining the predisposing influence of individual differences, and exposure to multiple risk factors for aggressive attitudes and behavior, provides a clearer understanding of the potential

causal role of violent game content (Browne & Hamilton–Giachritsis, 2005; Bryce & Rutter, 2006).

The positive relationship between violent game exposure and aggressive attitudes and behaviour is further questioned by the failure of numerous studies to replicate such findings (Anderson & Ford, 1986; Cicchirillo & Chory-Assad, 2005; Colwell & Kato, 2003; Cooper & Mackie, 1986; Ferguson et al., 2008a; Graybill, Strawniak, Hunter & O'Leary, 1987; Williams & Skoric, 2005). Survey research has also failed to demonstrate the influence of violent videogame play on real-world aggressive behaviour in children (Ihori, Sakamoto, Shibuya & Yukawa, 2007), or show the influence of violent media exposure on youth violence or aggression (Ferguson, Miguel & Hartley, 2009). Some studies have also found that violent videogame-play results in players feeling less aggressive and hostile (Ferguson & Rueda, 2010; Olson, Kutner & Warner, 2008), suggesting a positive influence of gaming on feelings.

Ferguson and colleagues identify numerous methodological issues which make the results of videogame violence research difficult to interpret (Ferguson, 2007a; 2007b; 2009; Ferguson & Kilburn, 2010). Recent meta-analytic reviews of the literature on violent videogame and aggression conducted by Ferguson (2007a) revealed evidence of publication bias for both experimental and non-experimental studies in this area in favour of results demonstrating this link. It was also found that studies did not provide enough substantial support for a causal or correlational association between playing violent videogames and aggressive behaviour. From analyses of seventeen published studies (total sample size = 3,602), the effect size for violent game exposure on aggression was $r_+ = 0.14$. Furthermore, this effect reduced to $r_+ = 0.04$ when corrected for publication bias[1]. Ferguson (2007) also suggested that unstandardised measures of aggression would be more susceptible to producing greater effect sizes than more standardised and reliable measures (e.g., HCR-20; Webster, Douglas, Eaves & Hart, 1997).

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[1] Ferguson (2007) used a number of procedures to correct for publication bias. These included examination of a funnel plot, the "fail-safe" N technique, Orwin's fail-safe, N, Begg and Mazumdar's rank correlation test, Egger's regression , and Duvall and Tweedle's trim and fill technique. See Ferguson (2007) for descriptions of these methods.

The use of ad-hoc measures of aggression suggests the need for caution when inferring the validity of aggressive responses of participants in laboratory studies of videogames. The evidence suggests that written measures of aggression present higher construct validity than physical responses measures (e.g., noise-blast protocols) (Carlson, Marcus-Newhall & Miller, 1989). This is potentially due to the fact that written measures are less susceptible to social conformity or demand characteristics which may influence participants when carrying out physical acts of laboratory aggression (Tedeschi & Quigley, 1996). Further, written measures are not limited in their external validity in the same way physical responses are, in relation to the fact that there is no absence of legal sanction for aggressive behaviour. That is, there are no adverse consequences for aggressive behaviour in the laboratory, in contrast to the legal consequences which prevail in everyday life (Ferguson & Rueda, 2009).

These theoretical and methodological shortcomings are addressed by Unsworth, Devilyy and Ward (2007) in response to Anderson et al.'s (2003) claims of the detrimental effects of violent videogames on adolescents' aggressive thoughts, feelings and behaviours. They indicated that the conclusions drawn from this study were problematic because of the limited reliability of gaming outcome measures. They further criticise the General Aggression Model (Anderson & Bushman, 2002b; Anderson & Dill, 2000; Anderson & Huesmann, 2003; Bushman & Anderson, 2002) in its assertion that personality, although recognised as a stable trait, can be changed through violent media exposure. They also suggest that the model does not account for other learning experiences which may impact on the individual. Their own study explored the role of arousal and emotional regulation in mediating the effects of violent videogame play. Evidence was found to suggest that type of temperament (i.e. stable or labile, as measured by personality traits, trait anxiety and trait anger), coupled with emotional state before gaming was predictive of the outcome of gaming. Labile temperament with high state anger before gaming led to lower state anger following gameplay. Labile temperament coupled with low state anger led to increased state anger affect following gameplay. Finally, stable temperament showed no change between pre and post test measures of state anger. They concluded that gameplay had no predictive validity in determining affective states of anger, and was not associated with aggressive temperament. The findings of this study are noteworthy since they provide evidence of personality and emotional influences on

the outcomes of gaming, which challenges the assumptions of the GAM, presenting a more holistic account of the potential influences and outcomes of gaming.

A further theoretical consideration is that of developmental influences for the influence of violent game content on aggressive outcomes. That is, there are likely to be distinctions between children, adolescents and adults in their experiences of violent game content. Differences between these sub-groups in social-cognitive processes, such as understanding mental states and developing morality may influence the experiences and potential outcomes of violence exposure. Further, children may experience and be affected by violence differently to adults, due to the cognitive representations of the distinctions between fantasy and reality. That is, following violent gameplay, children may imitate violent acts as a way of understanding them (Goswami, 2008). This is said to be a crucial function of children's cognitive development (Vygotsky, 1978). These developmental processes present distinctions between children and adults in their experiences and potential outcomes of violent content exposure. This suggests that evidence for the harmful effects of violent game content should distinguish between these sub-groups to understand the potential influences at different developmental stages. This concern is particularly relevant when considering the substantial body of experimental gaming research which uses samples of adults, and is subsequently presented as evidence of the harmful effects of videogames for children, for the purposes of public policy. The theoretical underpinnings of the GAM/GLM and similar models require further consideration of developmental influences for the potential outcomes of gaming for different samples of gamers.

The inconsistencies and shortcomings in the existing videogame research literature make it difficult to arrive at any firm conclusions about the effects of violent videogame content on aggressive-related outcomes. Furthermore, the evolution of videogames themselves makes it difficult to generalise from findings of research using older generation games (e.g. *PacMan, Doom*) or from studies examining effects of arcade gaming, since these do not characterise modern-day gaming activities (Schneider, Lang, Shin & Bradley, 2004). This contention is supported by research which found more positive gaming experiences were associated with playing newer games compared with older ones (Ivory, 2006; Ivory & Kalyanaraman, 2007). These

theoretical and methodological shortcomings present a justification for a reconsideration of the videogame research paradigm, and suggest that a wider, more holistic approach is required to represent a more comprehensive and valid account of the individual, social and technological influences on videogame experiences and outcomes.

The GAM as a framework accounting for the affective and behavioural outcomes of gaming does not provide a basis for explaining the social contexts in which the consequences of gaming occur, and how gaming motivations may moderate the process (Williams, Yee & Caplan, 2008). Although this is not a primary focus of the model, research suggests that these types of factors may interact with gaming outcomes. For example, evidence by Lim and colleagues (Lim & Lee, 2009; Lim & Reeves, 2010) found significant differences in physiological arousal between conditions of solo gameplay and collaborative gameplay, and between collaborative and competitive gameplay comparing a human player versus a computer-controlled agent. Understanding variables such as the motivational processes of gamers can provide indications of patterns of gameplay and genre preferences (Sherry, Greenberg, Lucas & Lachlan, 2006). This suggests the need for a greater research focus on the social and motivational aspects of gameplay in order to provide a more ecologically valid understanding of the gameplay experience. Examining gaming experiences can also develop understanding of how these influence potential outcomes for gamers.

In addition to understanding the influence of factors such as social context and gaming motivations, examining the psychological and emotional experiences associated with moral engagement or disengagement in taboo acts or violent gameplay also provides evidence for the potential outcomes of gaming (Young & Whitty, 2010). Research suggests that there are individual differences in emotional responses to violent or taboo content in games (Whitty, Young & Goodings, 2011), and these differences in psychological and emotional experiences are also likely to influence the outcomes of the activity. These different research areas suggest that existing theoretical models which propose the effects of violent game content on aggressive outcomes are too restrictive and unable to account for the influence of these additional factors. .

Similarly, the ability of some videogames to offer opportunities for players to engage in violent acts and violate real-life social norms in the virtual world can provide intense emotional experiences (Bertozzi, 2008). This violent gameplay can function as an outlet for certain types of behaviour which is not possible in real life without associated negative consequences (Bertozzi, 2008). The ability to morally engage with these forms of behaviour offers unique opportunities for gamers, and can be associated with positive emotional and psychological gaming experiences (Hartmann & Vorderer, 2010). This suggests that the consequences of violent gameplay are not necessarily solely negative or aggressive in nature.

The implications of the evidence showing links between playing violent videogames and aggressive outcomes constructs gaming as a social problem, and assumes all people experience games in the same way. It also implies that the process of gaming is entirely negative with no consideration of potential positive emotions associated with gameplay. Although some researchers now claim there to be conclusive evidence of the negative consequences of playing videogames (e.g., Anderson et al., 2010), gaming remains a highly popular contemporary leisure activity for a broadening range of individuals. It is likely that there will be a wide range of positive experiences and effects of playing videogames, and that gaming experiences must be enjoyable to encourage participation. The literature requires a more detailed examination of the processes involved in gaming rather than focusing too closely on the effects of game content. The experiential aspects of gaming can also provide some indication of the potential positive outcomes of playing videogames. A review of the positive effects of playing videogames is examined in the following section.

2.3. Positive effects of playing videogames

Despite research showing the harmful effects of videogames, the literature shows a number of positive effects. These include the beneficial use of games in particular contexts (e.g., education, health-care), and for positively influencing cognitive skills, improving hand-eye coordination and encouraging physical activity. Each of these topics will be reviewed separately in the following section.

2.3.1. Context

In order to accurately study the range of psychological, affective and social effects of videogames and gaming, it is important to first examine the contexts in which they are played. Whether videogames are played alone, with friends as a leisure activity or within a learning context, they can potentially provide different gaming experiences and be associated with different consequences for the player. The context also largely determines the type of game which is played. For example, few commercial games are appropriate for learning contexts, but are highly popular in everyday gaming contexts. The type of game therefore also influences gaming experiences in different contexts. The following section considers specific contexts in which games have been shown to have a positive influence.

Learning Contexts

"Edutainment" is a term which has been coined in reference to the use of videogames in learning and education contexts. Prensky (2005) has suggested many reasons why videogame-playing and computer game-based learning can be beneficial in educational contexts. These include games being enjoyable, motivating, interactive, exciting, creative and providing instant feedback. For game-based educational interventions to be effective however, videogames must engage and motivate players through active and direct experiences within the gameworld (Kiili, 2005). This will allow exploration, manipulation and interaction between the player and the game in providing an active learning experience. Furthermore, games provide competitive activities with goals, feedback, rules and interaction (Kim, Park & Baek, 2009), all of which have positive implications for learning. The interactive nature of videogames is the key feature which facilitates learner engagement through associated cognitive processes and behavioural participation (Ritterfield, Shen, Wang, Nocera & Wong, 2009).

The use of videogames within educational contexts has been shown to be effective in facilitating a number of skills: strategic thinking, cognitive-based skills and content-related learning (McFarlane, Sparrowhawk & Heald, 2002). Videogames can also be an effective way of motivating learners, increasing engagement with the subject, and transforming the learning experience from passive into active (Fu, Su & Yu, 2009). Gee (2003) suggests that using videogames in learning environments can be a useful way of encouraging active and critical thinking. Several researchers have suggested

that the educational use of videogames can be more enjoyable, motivating, interesting, immersive, and more effective than more traditional forms of learning (Gee, 2003, Owston, Wideman, Ronda & Brown, 2009; Prensky, 2001). Games have been shown to be a useful e-learning tool to help foster a deeper learning experience (Pulma, 2007), whilst also offering greater enjoyment for the learner. Furthermore, they can facilitate both formal and informal learning approaches, including role-playing, experiential learning and game-based learning (Warburton, 2008).

A number of empirical studies have addressed the use of videogames in specific academic disciplines and have generally shown positive influences for motivation and effective learning. These include: mathematics, geography, sciences and languages (Corbett, Koedinger & Hadley, 2001; Ke, 2008; Papastergiou, 2009; Rosas et al., 2003; Turgut & Irgin, 2009). Ke (2008) examined the use of computer gaming for children learning maths. Comparisons of pre and post test measures of participants' cognitive performance, however, showed no significant effects for the effectiveness of the intervention, but there was evidence of increased positive attitudes towards maths following the intervention. Research on high school students' learning of genetics has shown evidence of higher level of engagement following the videogame intervention than before (Annetta, Minogue, Holmes & Cheng, 2009).

The educational implications of online games have also recently been examined (Griffiths & de Freitas, 2007; Kirkpatrick, McLaughlin, Maier & Hirsch, 2002; Kim, Park & Baek, 2009; Paraskeva, Mysirlaki & Papagianni, 2009; Turgut & Irgin, 2009). Findings have shown benefits for problem-solving skills, decision-making, team-building, ICT skills and motivation for learning. Further evidence for the motivating nature of videogames for learning is presented in a review examining the potential effectiveness of gaming for learning and training by facilitating intrinsic motivation to engage in the learning process, and providing fun and appropriate challenges (De Freitas & Griffiths, 2007). Numerous researchers have supported this notion by presenting evidence of increased motivation for learning in a range of educational contexts (Malouf, 1988; Papastergiou, 2009; Tüzün, Yilmaz-Soylu, Karakuş, İnal & Kizilkaya, 2009). Malouf (1988) suggests that the ability of videogames to facilitate feelings of self-efficacy and competence increases motivation, and that this accounts for their potential educational implications.

The choice of videogames used in game-based interventions in learning contexts, however, should ensure the appropriateness of game content and genre, as well as the suitability of academic subjects for the application of such an intervention (Karakus, Inal & Cagiltay, 2008). A recent content analysis of educational videogames revealed that puzzle games were the most common game genre used (Liu & Lin, 2009). Puzzle games can be beneficial in learning contexts from the cognitive and strategic processes which are required to complete them, and to enhance a range of relevant skills. This indicates the importance of considering specific types of games in relation to their content, the gameplay processes they provide, and how this influences particular types of knowledge or skill development.

Healthcare Context

Videogames and game-based interventions have also been shown to have potential utility within healthcare contexts. Lieberman (2001) outlines the potential benefits of videogames within health awareness programmes as providing an interactive, experiential learning environment which can promote motivation, and facilitate health-related self-efficacy and behaviour. Furthermore, social support and feedback on health-related choices can be provided which can help transfer knowledge to real-life situations.

The associated benefits have been proposed to facilitate health awareness (Hewitt, Denman, Hayes, Pearson & Wallbanks, 2001; Hornung et al., 2000); to aid physiotherapeutic interventions for patients with spinal cord injuries (Betker et al., 2007; O'Connor et al., 2000); muscular injuries (Vilozni et al., 1994), and motor functioning in stroke patients (Yavuzer, Senel, Atay & Stam, 2008). Also, for cognitive distraction from pain during rehabilitation (Adriaenssens, Eggermont, Pyck, Boeckx & Gilles, 1988; Coyle, Matthews, Sharry, Nisbet, & Doherty, 2005). They have also been found to provide cognitive distraction from pain for patients with severe burns (Adriaenssens et al., 1988), for children with sickle cell disease (Pegelow, 1992), and for patients undergoing chemotherapy treatment (Kolko & Rickard-Figueroa, 1985; Redd et al., 1987; Vasterling, Jenkins, Tope & Burish, 1993).

The use of videogames as a distraction has also been examined in children with preoperative anxiety (Patel et al., 2006). Patel et al. (2006) measured self-reported anxiety of children at baseline and induction of anaesthesia before surgery in one of three conditions: a videogame condition, a medication condition, and a control condition (no intervention). Results showed that in the medication and control conditions, there was a significant increase in anxiety from baseline to induction of anesthesia, whereas there was no significant increase in the videogame condition. They concluded that handheld videogames were an effective distraction and anxiety-relieving intervention for children prior to surgery.

Military training

Prensky (2001) documents the use of videogames in training in the US Military for the training of soldiers, pilots, sailors and tank drivers in appropriate handling of equipment (e.g., driving tanks), as well as for strategy development, teamwork and response training. Games designed specifically for the military (e.g. *Full Spectrum Warrior* and *Full Spectrum Command)* have been used to teach skills such as organisation, decision-making and recognising threats. Twitchell, Wiers, Adkins, Burgoon and Nunamaker (2005) designed a MMORPG, *StrikeCOM* which they suggested could support military group interactions and processes. It was also used to study the detection of deception in groups and leadership in collaborative group decision-making. The Marines also created their own version of the game *Doom* (*Marine Doom*) which incorporates a networked format to enable team players to coordinate their movements in order to work towards the common goal of destroying an enemy bunker. This has been proposed to facilitate player communication, and concepts of command and control (Prensky, 2001).

2.3.2. Cognitive skills

Research also suggests that videogames can have beneficial consequences for a range of cognitive skills, including visual attention, reaction times, spatial perception and strategic thinking (Basak, Boot, Voss & Kramer, 2008; Chuang & Chen, 2009; Goldstein et al., 1997; Green & Bavelier, 2003, 2006, 2007; Rueda, Rothbart, McCandliss, Saccomanno, & Posner, 2005; Sims & Mayer, 2002; Subrahmanyam & Greenfield, 1994). Green and Bavelier (2003) demonstrated that videogames can modify selective attention skills. Their research comprised five studies in which

changes in perceptual and spatial skills were established. Habitual action videogame players showed better visual attention skills compared to non-players. Additionally, training non-players in action games led to improvements in these skills. Similarly, Green and Bavelier (2007) demonstrated that action videogame players had more proficient spatial resolution of vision than non-videogame players. Furthermore, they showed that training non-gamers in playing action games aided improvement in their spatial resolution of vision. Similar cognitive benefits have been found for mental rotation ability (Cherney, 2008; Sims & Mayer, 2002), eye-tracking (Trick, Jaspers-Fayer & Sethi, 2005), reaction times, attentional skills (Dye, Green & Bavelier, 2009; Rezaiyan, Mohammadi & Fallah, 2007; Rueda, et al., 2005) and spatial visualisation (Subrahmanyam & Greenfield, 1994).

Ferguson's (2007b) recent meta-analytic review of the literature on the effects of violent videogames on increased visuospatial cognition revealed that from seven published studies (total sample size = 384), the effect size was $r_+ = 0.49$. This supports the notion of potential benefits of videogames for cognitive-related skills.

Quiroga et al. (2009) have addressed the question of whether success in videogames requires general intelligence. Three Nintendo Wii *Big Brain Academy©* Games (*Train, Calculus* and *Backward Memory*) were used as training aids for spatial ability, numerical ability and short-term memory. Following a one month training period, comparisons of pre and post test measures of cognitive abilities revealed that playing the game *Train* significantly increased the correlation with general intelligence measures. The other two games, however, did not demonstrate such an increase. They concluded that it is necessary for the design of videogames to be strategic if they are to be used to stimulate cognitive abilities. This is key, since it highlights the issue that the outcomes of gaming are largely determined by the type of game, and that some types of games are more suited to developing cognitive skills compared to others. Pillay (2003) proposed that the cognitive processes used by game players were influenced by the type of game being played. For example, adventure games facilitated inferential and proactive thinking whereas other types of game fostered more means-end strategies. This highlights the need to recognise that such effects of playing videogames for cognitive skill development cannot be generalised across all

game types, and so consideration is warranted for specific types of games which can best facilitate these skills.

2.3.3. Hand-eye coordination

The literature has also shown that the mechanics of playing videogames can have beneficial effects for the development of specific skills and physicality which can be transferred to real life.

Sadandanan, Dryfhout and Sosnowski (2008) examined the laparoscopic skills[2] of participants before and after a ten minute gameplay period on a *Nintendo GameCube.* Measures of hand-eye coordination and ambidexterity were taken through tasks such as transferring objects (e.g., pegs) using laparoscopic equipment. The results revealed that all tasks undertaken were significantly better following gameplay than before. This is supported by previous research by Rosser et al. (2007) who assessed the role of videogame experience on the laparoscopic skills of surgeons, and found that those with higher videogame-related skills (i.e. those who had more videogame experience) performed more accurately and efficiently than non-gamers in simulated surgery drills.

2.3.4. Encouraging physical activity

In recent years, "exergames" (exercise-based videogames) have been developed to encourage physical activity for children and adults. Examples of these games include the *Nintendo Wii Sports Games*, the *Wii Fit,* and *Dance Dance Revolution.* This is particularly important due to public health concerns over daily life being increasingly sedentary, and increased rates of obesity. Physical activity can benefit musculo-skeletal health, cardiovascular health and levels of blood pressure (Biddle, Gorely & Stensel, 2004; Strong, Malina, Blimkie et al., 2005).

Recent research has started to examine the ways in which exergames can help promote increased levels of physical activity, particularly in children and adolescents (Daley, 2009; Graf, Pratt, Hester & Short, 2009; Graves, Stratton, Ridgers & Cable, 2007; Maddison et al., 2007; Ridley & Olds, 2001). Such studies have recognised the potential benefits of active videogames such as *EyeToy Knockout* and the *Nintendo*

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[2] A medical procedure using small incisions to the abdomen to feed through a small video camera

Wii's Sport games as ways of encouraging greater involvement in physical activity and associated positive health outcomes. Ridley and Olds (2001) observed patterns of activity in children while playing numerous videogames. They showed that new generation games can promote moderate to high energy expenditures, suggesting that game designers should consider this in future game development. Further research examining the activity levels of children during gaming was conducted by Maddison et al (2007). They found that playing active videogames was comparable to light to moderate conventional forms of physical activity (e.g. walking and jogging).

Unnithan, Houser and Fernhall (2006) examined the dance simulation game, *Dance Dance Revolution* (DDR), and its impact on exercise intensity in normal weight and overweight children. Findings revealed that cardiovascular measures for both groups were maintained at high levels during the DDR protocol, suggesting it to be successful in providing an effective aerobic work-out and developing cardio-respiratory endurance. These studies indicate the physiological benefits of engagement in active videogames, but it must be emphasised that they are by no means a replacement for physical exercise and should not be considered a complete solution to inactivity or obesity (Mark & Rhodes, 2009).

2.3.5. Enjoyment and well-being

The previous sections have focused on the positive influence of videogames for physical effects, such as cognitive skill development and psychological enhancements for motivation in learning. This section addresses the influence of playing videogames on affective experiences and outcomes, and considers the notion of adopting a leisure perspective as a theoretical framework for understanding the experiential aspects of gaming and their influence on potential outcomes and consequences.

Enjoyment and fun are central to gaming experiences, as is the case for other forms of media entertainment (Vorderer, Klimtt & Ritterfield, 2004). It seems reasonable therefore, that gaming will have positive experiences and effects for players. There has been little examination of gaming experiences on positive affective outcomes (e.g., enjoyment) and general well-being, although Smith (2007) found evidence that experiences of flow during gameplay (measured by self-reported skill and challenge) predicted post-gameplay enjoyment and positive affect in experimental settings.

Some studies have examined the enjoyment of playing videogames by examining the influence of specific game aspects. These suggest that social relations among gameplayers, competition, suspense in storyline and perceived control within the game are influential to game enjoyment (Klimmt, 2003; Klimmt, Hartmann & Frey, 2007; Klimmt, Rizzo, Vorderer, Hartmann & Fischer, 2003; Klimmt, Schmid & Orthmann, 2009; Weibel, Wissmath, Habegger, Steiner & Groner, 2008). Other research has examined the influence of social factors in gaming for aspects of well-being. Longman, O'Connor and Obst (2009) identified that the social support which can be derived through playing online games is positively associated with fewer negative psychological symptoms (i.e., depression, stress and anxiety). This highlights the need to consider the wider benefits of gaming, which have received minimal empirical attention.

The findings of these studies suggest positive experiences of enjoyment have associations with positive psychological and affective outcomes. It also suggests that people play games for the positive experiences which they can provide. This implies an inherent link between experiential and motivational aspects of gaming. Examining these associations by considering gaming within the wider context of leisure and leisure theory can provide a greater understanding of their influence on gaming outcomes and consequences, and a more holistic understanding of gaming. A review of leisure theory and research comprises the following section.

2.4. Leisure

Most people engage themselves in leisure activities to experience enjoyment and freedom from everyday life (Harper, 1986). In this way, leisure is usually intrinsically motivated, as individuals participate under minimal external obligation. For the purposes of the current research, leisure is defined as an activity which is characterised by perceived freedom and intrinsic motivation (Iso-Ahola, 1980; Neulinger, 1981), which can allow for personal growth or development.

Leisure is distinct from most daily activities due to the sense of freedom and autonomy which it provides. This itself is a strong motivator for leisure engagement

and can determine potential psychological benefits for participants. Such benefits include enhanced well-being (Caldwell & Smith, 1988; Edwards, 2006; Iso-Ahola & Mannell, 2004; Trainor, Delfabbro, Anderson & Winefield, 2010), positive mood (Hull, 1990; Pressman et al., 2009), and higher levels of self-efficacy and self-esteem (McAuley, Courneya, & Lettunich, 1991). Leisure theory posits that the underlying mechanism for these benefits is the enhancement of self-determined motivation and the individual's belief that they have the capabilities to achieve success (Iso-Ahola, 1992). In addition, the enjoyment and positive experiences which leisure provides can enhance positive perceptions of life satisfaction and psychological well-being (Haworth, 1997; Haworth & Hill, 1992). This link is supported by a number of empirical studies and suggests that engagement in leisure has positive implications for wider psychological benefits (Bartko & Eccles, 2003; Iso-Ahola, 1997; Iwasaki & Smale, 1998; Kohn & Schooler, 1983; Sacker & Cable, 2005).

Researchers have also suggested that leisure can be a means of stress-relief (Berger, 1994; Coleman & Iso-Ahola, 1993; Iso-Ahola, 1988). Iwasaki and Mannell (2000) explain the stress-reducing properties of leisure through proposing three dimensions which can moderate stress. Firstly, leisure can be an escape strategy from adverse negative feelings. Secondly, leisure activities can enhance mood through tension reduction. Thirdly, leisure can offer opportunities of social support which can aid the stress management processes. This notion is supported by Iso-Ahola and Mannell (2004) who suggest that leisure provides opportunities for recuperation and relief of work-related stress. Similarly, research has found that involvement in active leisure can facilitate positive mood (Biddle, Fox & Boutcher, 2000), and be associated with significant improvements for overall well-being (Edwards, 2006).

The benefits of active leisure can be attributed to the physiological mechanisms (e.g., increased heart rate, cardiovascular responses) involved in undertaking such activities, and there is substantial medical evidence endorsing the importance of physical activity in maintaining good health (Warburton, Nicol & Bredin, 2006). This suggests that the benefits may not only be a product of psychological enhancement, but also the associated physio-psychological mechanisms. Alternatively, it could be a combination of both the psychological and physiological mechanisms associated with physical activity which results in the observed effects. Research supporting the

benefits of physical activity includes the work by Parfitt and Eston (2005), who compared children's levels of physical activity and the associations with self-esteem, depression and anxiety. Their findings showed positive correlations between activity level of measures of self-esteem, and negative associations with depression and anxiety, suggesting engagement in physical activity to have positive implications for dimensions of well-being.

The experience of social support which can be derived through some leisure activities has been identified as a means of reducing loneliness and of enhancing health and well-being (Caldwell & Smith, 1988). Similarly, Lammel (2004) found that leisure-related variables influenced psychological well-being in individuals who had suffered traumatic brain injuries. It was suggested that this influence was achieved through social support mechanisms. Social factors, therefore, appear to play an important role in the link between leisure activities and the associated benefits for well-being.

This review suggests that there is consistent evidence in the literature of the benefits of engagement in leisure for health and well-being. This has been shown to be apparent through processes such as stress-relief, social support and alleviation of negative mood. The extent to which individuals derive positive experiences and effects from leisure is dependant on the type of activity. That is, leisure activities vary in relation to the way they facilitate experiences. For example, some leisure activities are solitary pursuits (e.g., stamp collecting) which do not integrate the influence of social support, but remain enjoyable for the individual. Others are sedentary pursuits (e.g., knitting), and therefore do not endorse the physical benefits which other activities provide (e.g., cycling). However, the fact that leisure pursuits are intrinsically motivated suggests that the enjoyment which leisure provides can be consistently demonstrated across a range of leisures and can therefore hold similar psychological experiences and benefits. One such positive experience is "flow", which is promoted through intrinsic motivation for an activity, coupled with feelings of heightened enjoyment which derived from a perceived sense of freedom and exertion of control in an activity (Csikszentmihalyi, 1975).

2.5. Flow

The concept of flow was first established by Csikszentmihalyi based on his observations of a group of artists. He noticed that they were deeply immersed in their work and showed high levels of enjoyment. He observed that this deep involvement with the activity could be explained by the fact that the rewards from the process of painting seemed to derive from the painting itself (Csikszentmihalyi, 1988). In this way, the artists appeared to be intrinsically motivated by the processes of painting.

Csikzentmihalyi's (1992) subsequent observations of individuals engaged in a range of activities (e.g., rock climbing, rock dancing, chess), led him to propose that flow states occur more freely in those activities which are structurally designed to facilitate deeper levels of concentration and involvement. This distinguishes "optimal experiences" from normal, everyday tasks (Csikszentmihalyi, 2003), and describes a psychological state in which an individual behaves freely from societal or cultural controls due to the power of the consciousness (Csikszentmihalyi, 1988). To provide a holistic approach to the study of these enjoyable experiences, Csikszentmihalyi (1975) proposed that the examination had to move beyond simply knowing the individual's learned associations to pleasant experiences and the characteristics of the activity, to account for the individual's abilities and subjective evaluation of the situation. The interaction between these processes he suggested, determines the enjoyment of the activity. In this way, flow theory focuses on the relationship between the individual's skills with the personal meanings they derive through the activity.

Intrinsic motivation constitutes a key component of the flow experience, and this is strongly associated with the notion that an individual undertakes an activity purely for the sake of doing it. Csikszentmihalyi (1993) used the word "autotelic" to describe this phenomenon, meaning that the activity is an end in itself. *Autotelic* is taken from the Latin words *auto* and *telic* (*auto* = self, *telic* = goal or purpose). The individual is focused on the processes involved in the activity, rather than its potential consequences (Csikszentmihalyi, 1992). The main characteristic of the autotelic experience being that it is an experience which is rewarding enough in itself, to promote continued behaviour, in the absence of other rewards (Csikszentmihalyi, 1975).

Flow refers to a process in which each action follows the previous action, with no conscious intervention of the individual (Csikszentmihalyi, 1975, 1990). To explain a behaviour, flow theory emphasises the situational variables and meaning derived from a given situation by an individual. Furthermore, flow occurs when the capabilities of the individual are at a level equal to the challenge of a specific activity (Csikszentmihalyi & Csikszentmihalyi, 1988; Massimini & Carli, 1988). The nature of this balance is integral to the individual's perceptions of enjoyment which can be derived from an activity. Supporting evidence for the positive consequences of an optimal balance between skill and challenge includes Clarke and Haworth (1994) and Haworth and Evans (1995) who demonstrated that high enjoyment value of an activity was associated with the balance of high challenge and equal skill. Furthermore, perceptions of high challenge-skill balance have been associated with a range of positive indictors including high levels of arousal, intrinsic motivation, positive affect and enjoyment (Csikszentmihalyi, 1975, 1982; Ellis et al., 1994; LeFevre, 1988), and to have positive consequences for engagement in classroom learning (Shernoff, Csikszentmihalyi, Schneider & Shernoff, 2003) and self-affirmation [3]in daily living (Voelkl & Ellis, 1998).

The notion of a balance between skill and challenge, has led researchers to produce models of skill and challenge ratios, and to study the effects of different balances (Clarke & Haworth, 1994; Csikszentmihalyi, 1997; Ellis et al., 1994; Haworth & Evans, 1995; Massimini & Carli, 1988). Such flow models are discussed in further detail in the following section.

2.5.1. Flow models

Csikszentmihalyi (1975) originally formulated a three-channel flow model which postulated that three possible experiential states could arise from the ratio of the challenge-skill balance. A well-matched challenge to skill ratio is best for the facilitation of flow states. This balance generates enjoyable, optimal experiences which have been shown to lead to enhanced well-being (Csikszentmihalyi, 1990). Csikszentmihalyi (1975) suggested that any activity which is intrinsically motivated requires optimal challenge in order for the flow experience to occur. Research on flow, and related work on intrinsic motivation, suggests that the challenge of an activity is a

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[3] Maintaining self integrity

critical factor in determining the experience an individual gains from the activity (Csikszentmihalyi, 1975; Deci & Ryan, 1985). In cases of a high challenge to low skill ratio, anxiety is said to occur. Conversely, a low challenge to high skill ratio can result in boredom. Massimini and Carli (1986) extended the three-channel model by proposing a fourth possible challenge–to-skill ratio. They suggested that a low-skill, low-challenge ratio would lead to a state of apathy. This has become known as the four-channel model of flow (see Figure 1) and has been examined within a range of different contexts, including kayaking (Jones, Hollenhorst, & Perna, 2003) and aspects of learning (Konradt & Sulz, 2001).
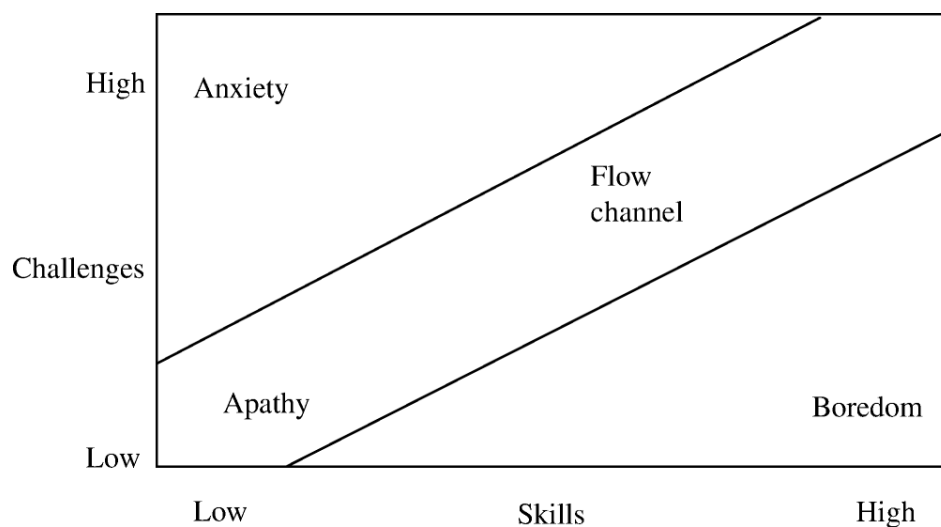
Figure 1: Four-channel flow model (Massimini & Carli, 1986)

Building from the four-channel model, Csikszentmihalyi and Nakamura (1988) proposed the introduction of additional channels. From this, an eight-channel model was developed (Massimini & Carli, 1988). This model includes four further channels of arousal, control, worry and relaxation. Ellis et al.'s (1994) research on flow in the daily lives of older adults showed that the eight-channel model was significantly predictive of affect measures. Furthermore, the "flow channel" of the eight-channel model has shown to be the best predictor of positive states (e.g. excitement, activation, satisfaction), compared to the other seven channels (Haworth, 1997; Massimini & Carli, 1988).

2.5.2. Dimensions of flow

Csikszentmihalyi (1975) originally proposed that flow experiences have seven dimensions: 1) *clear goals and immediate feedback,* where the objectives of the activity are clearly defined either before or during involvement in an activity. This provides the individual with a sense of what they are required to do and provides a clear focus. Furthermore, clear feedback is available during the activity which allows the individual to know whether they are successful in attaining the goal/s of the activity. During flow, the individual does not consciously evaluate the feedback, rather this takes an automatic form of reflection. 2) *Balance between skill and challenge,* where both the perceptions of capabilities of an individual and the perception of challenge of an activity are at equally high levels. This allows the activity to be accomplished by the individual, while controlling for the boredom or anxiety which may arise if the task is too easy or difficult, respectively. It is important that the level of challenge and the individual's capabilities are not only in equilibrium, but are higher than their average level of experience (Fewtrell & O'Connor, 1995). The balance of a high-skill level to high-challenge ratio can enhance perceptions of competence, and explains the intrinsic nature of motivations for an individual undertaking an activity, according to Self-Determination Theory (Deci & Ryan, 1985). This postulates that the individual takes part in an activity purely through personal choice rather than for extrinsic reasons (e.g., obligation, money, rewards). 3) *Focused attention/ deep concentration,* in which the individual is in a state of total focus on the activity they are undertaking. This allows them to distract themselves from any concerns which can arise from daily life. 4) *Sense of control,* when an individual feels that they are in control of the activity without active attempts to do so. 5) *Altered sense of time* during the activity, where an individual may experience the sensation of time either slowing down or speeding up. 6) *Lack of self-consciousness* as an individual loses concern for the self and what others may think of them, and can also lead to transcendence of the self, in which an individual feels distant from the self. 7) *Mergence of action and awareness* in which an individual may become so involved in an activity that they aware of the actions but not of the awareness itself. This is often reported as "being at one with the experience" (Csikszentmihalyi, 1992: p.53). The inclusion of all these elements produce what Csikszentmihalyi (1975) describes as an overall autotelic experience.

Following from his original conceptualisations, Csikszentmihalyi (2003) later proposed that the flow dimensions occur in two distinct sets: "conditions" and "characteristics". Conditions constitute the prerequisites for establishing the appropriate circumstances in which flow occurs. Satisfying the dimensions of balance between skill and challenge, clear goals and immediate feedback ensures the correct conditions which are conducive to the experience of flow. Characteristics refer to the feelings which are experienced during flow. These are the remaining flow dimensions of: a merge of action and awareness, deep concentration, sense of control, loss of self-consciousness, time distortion and the perception of an autotelic experience.

2.5.3. Flow in Context: Leisure

Leisure can be conceptualised by emphasising the dimensions of positive experience, such as enjoyment and intrinsic motivation, which can be derived from leisure pursuits (Iso-Ahola, 1980; Thompson, Grant & Dharmulingam, 2002). This approach has a focus on the personal experience of leisure. Understanding individual experiences is important for understanding the motivations for engagement in particular leisure behaviours. Similarly, identifying motivations for a particular behaviour can be useful in examining how individuals experience an activity. That is, the motivations and experiences of an activity are closely associated, and work interactively to determine the nature of the psychological and social consequences of engagement for the individual. It can be assumed, therefore, that the intrinsic nature of people's leisure motivations, and the associated positive experiences of flow, can be predictive of the benefits of leisure engagement.

Substantial evidence has demonstrated the existence of flow in leisure contexts (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988). For example, flow experiences have been widely observed in sport contexts (Jackson, 1992; Jackson & Eklund, 2002; Stavrou, Jackson, Zervas & Karteroliotis, 2007). Furthermore, flow has been used as a framework for explaining why individuals participate in a wide range of activities. These include; high-risk sports, (Jones, Hollenhorst & Perna, 2003), Internet activities, (Chen, Wigand & Nilan, 1999; Novak, Hoffman & Duhackek, 2003; Pace, 2004; Siekpe, 2005; Thatcher, Wretschko & Fridjhon, 2008), and online gaming (Hsu & Lu, 2004; Shin, 2006; Wan & Chiou,

2006). In this way, flow can be used as an explanation of both motivational and experiential factors for engagement in leisure.

Research evidence suggests that the most enjoyable experiences are derived from engagement in leisure-related activities as opposed to other daily activities, particularly within work contexts. Stebbins (1992a) coined the phrase "serious leisure" to conceptualise the nature of activities facilitating the experience of flow. "Serious leisure" activities have been defined as tasks which promote skill acquisition, effort and are intrinsically motivating for the individual. Furthermore, such activities have been proposed to consist of six distinct qualities. One quality is the need for *perseverance*. The second quality proposed by Stebbins (1992a) was the need to make *careers* of such activities. The third quality is the requirement for *significant personal effort* in the activity. The fourth quality requires the experience of *benefits* derived from the chosen activity, such as self-enrichment. The fifth quality is the *unique ethos and social world* of the leisure activity. The final quality requires that participants *identify* strongly with their chosen leisure activity, both emotionally and physically. Csikszentmihalyi (1990) suggests that activities such as "serious leisure" which require high commitment, discipline and effort are more likely to provide appropriate conditions to facilitate flow.

Research has embraced Stebbins' (1992a; 2006) notion of serious leisure and focused on the quality of experience in predicting flow. Delle Fave, Bassi and Massimini (2003) examined flow as a product of the quality of experience in rock climbers. The evidence showed that high challenge and skill level influenced flow experiences during climbing expeditions. Delle Fave and Massimini (2003) found further evidence of flow experiences within leisure activities through studying the work and leisure experiences of teachers and physicians. Their findings suggested that flow experiences, characterised by engagement, enjoyment and intrinsic motivation, mostly occurred in structured leisure activities and in complex, engaging tasks.

2.5.4. Flow in Context: Modern Technologies

A substantial body of evidence considers flow during the use of modern technologies, and the way in which these positive experiences can determine a variety of outcomes. Typically these outcomes include increased exploratory behaviours, positive affect,

learning, user satisfaction and acceptance (Chen, 2006; Chen, Wigand & Nilan, 1999; Choi, Kim & Kim, 2007; Ghani, 1991; Ghani & Deshpande, 1994; Liao, 2006; Shin, 2006; Webster, Trevino & Ryan, 1993).

Chen and colleagues (Chen, 2006; Chen et al., 1999) have undertaken studies examining flow experiences during Web-based activities such as information retrieval, email and online chatting. Chen et al's (1999) analyses revealed that the online activity which received the highest reported experiences of flow was information retrieval, followed by accessing newsgroups and email activities. Chen (2006) found that Internet users experience positive mood whilst undertaking online activities.

Other studies have considered the role of flow for participants in distance and online learning programmes (Liao, 2006; Shin, 2006). Findings have typically shown that experiences of flow within these contexts are beneficial for user behaviour. For example, Shin (2006) examined the flow experiences of online learners and found that skill and challenge were determinants of flow, and significant predictors of satisfaction in online learning. Liao (2006) demonstrated that flow, when characterised by perceptions of skill, challenge, control and interactivity, could significantly predict intention of use of learning programmes and exploratory behaviours in distance learning education.

Studies examining the role of flow in human-computer interactions have demonstrated how the experience of flow states can be associated with outcomes such as learning, playfulness, and exploratory behaviours in computer usage (Choi, Kim & Kim, 2007; Ghani, 1991; Ghani & Deshpande, 1994; Webster et al., 1993). Webster et al. (1993) found flow experiences in human-computer interactions to be significantly correlated with modifiability and experimentation in computer usage. These findings are similar to those of Ghani and Deshpande (1994), who showed that flow, as characterised by enjoyment and deep concentration, was significantly associated with exploratory behaviours and computer usage. Similarly, Hoffman and Novak (1996) suggested the positive consequences of flow experiences within a marketing context for consumers. Benefits included increased consumer learning, exploratory behaviour and positive affect.

The findings from web-based contexts therefore, suggest that experiences of flow are positively associated with more exploratory behaviour, greater usage and some aspects of learning. The following section reviews the literature on flow in a specific form of modern technology: videogaming.

2.5.5. Flow in Videogaming

Because flow can account for the positive experiences which individuals can derive from enjoyable activities, it seems reasonable to suggest that flow can be applied to gaming as its main objective is to provide gamers with positive experiences which facilitate fun and pleasure. This suggests that positive experiences of gaming will be a critical element in the gaming experience, and requires greater consideration within the academic literature.

There is some evidence to suggest that certain game characteristics influence experiences of flow in gaming (e.g., challenge, complexity, feedback) (Inal & Cagiltay, 2007). Considering the structural components of videogames presents a case for the way they can facilitate flow experiences. A large majority of games include mission objectives and comprehensive introductions which can act as **clear goals** for players before and during the game experience. In-game cut scenes are also a useful way of ensuring that game goals are presented clearly to the player. **Feedback** is provided in a number of different forms within games (although will vary depending on the particular game). For example, points or achievements are added for successful completion of objectives or missions, and these are logged for the player to access during the game. Furthermore, multi-sensory feedback is often provided through console controllers (e.g., vibration to indicate wounding of a player's character), therefore giving the player clear feedback on their gaming performance. This stimulation can therefore enhance the sensory experience of the videogame. **Balance of skill and challenge** can be controlled through a player selecting a difficulty level appropriate for their capabilities. Therefore, an equal balance can be established between the player's skills and the challenge of the game in order for flow to be facilitated. A gradual progression of new challenges should be presented for the player to master to aid the skill development at an appropriate rate. Many games are designed to provide players with appropriate learning curves on which they can successfully progress in games. This ensures that the challenge of the game is not too

51

high for players' skill levels. **Deep concentration** can be facilitated by a game which provides rich, detailed environments, with good automation and numerous objects to control (Sweetser & Wyeth, 2005). These features, in turn, help draw players into the game (Jones, 1998). **A sense of control** is usually experienced during gaming through the mastery of the console controller and functions. **Lose of sense of self** is facilitated through acting in ways which would not normally be undertaken in real life, or through experiencing the game in a character role. **Distorted sense of time** is often facilitated both through the experienced sense of heightened immersion of playing, but also through the fact that many games run on an altered time system (Jones, 1998). The presence of these components can therefore create an overall autotelic experience, characterised by players' heightened enjoyment, and the drive to play, purely for the sense of internal reward they derive through gaming.

These characteristics of videogames result in them being ideal facilitators of creating and maintaining flow experiences. However, to date, there is little empirical evidence examining the influence of different game aspects on flow. Some studies using flow theory as a theoretical framework have examined factors such as game design (Johnson & Wiles, 2003), social interaction (Inal & Cagiltay, 2007), as well as some game characteristics (Voiskounsky, Mitina & Avetisova, 2004). Inal and Cagiltay (2007) found that game challenge was a key determinant of flow in children's interactive social gaming experiences, and that there were noteworthy differences between girls and boys in flow experiences given that boys had higher preferences for gaming. They also found that competitive factors in gaming were a means of facilitating flow experiences within social gaming contexts.

A body of research has specifically studied online gaming and the flow experience (Voiskounsky et al., 2004; Wan & Chiou, 2006; Weibel et al., 2008). Wan & Chiou (2006) considered the engaging and interactive nature of online games and found evidence that online gameplay facilitates flow experiences. Voiskounsky et al. (2004) addressed flow experiences of MUD-players (Multi-User Dungeons or Multi-User Dimensions), and the role of flow in determining gaming behaviour. MUDs are text-only virtual environments, which incorporate online groups of gamers in adventure-based games. A particular feature which attracts gamers to these environments is the interaction between players within the gaming community (Voiskounsky et al., 2004).

The findings from this study revealed that flow was a key determining factor of gameplay for MUD-players. These findings are interesting, and reference should be made to the possibility of the potential negative consequences of flow for gamers, (e.g., game addiction) in these cases. Some researchers have proposed the role of flow in facilitating addictive gaming behaviour (Chou & Ting, 2003). Although flow theory suggests that the experience of flow is positive for the gamer, it is possible that its social consequences could be negative. Further, aggressive individuals may derive highly positive flow experiences through violent gameplay, and this may be associated with negative behavioural consequences. This is consistent with research examining the experience of flow and deviant behaviour (Katz, 1988). Although the social consequences of such behaviour would be perceived as negative, the individual's experience of flow could be positive. It would be interesting for future research to examine the way in which gamers' engagement with violent content, for example, triggers equivalent flow experiences and how these might be associated with aggressive attitudes and behaviour. The role of individual differences (e.g., addictive personality, aggressive personality) in facilitating flow in gaming, and the potential consequences of this experience represents an area for further research.

In relation to further positive outcomes, flow in gaming has also been shown to be associated with greater game loyalty (Hsu & Lu, 2004; Lee & Larose, 2007), gaming intentions (Choi & Kim, 2004; Hsu & Lu, 2004), and to have positive consequences for enjoyment and affect (Klimmt, Hartmann & Frey, 2007; Smith, 2007). Hsu and Lu (2004) used flow theory as a partial explanation for the intentions of gamers to engage in online games. They used an adapted version of the Technology Acceptance Model (Davies, Bagozzi & Warchaw, 1989), including social influences and flow as predictors of attitudes and intention towards playing online games. Their findings revealed that flow could significantly predict intention to play, suggesting that gamers intend to play continuously when they feel immersed in games. Further to gaming intentions, Choi and Kim (2004) and Lee and Larose (2007) found that flow experiences were determinants of loyalty behaviour, self-regulation and habitual consumption behaviour in online gaming. This suggests that self-determined motivations for engagement in gaming may be associated with experiences of flow.

Webster et al's (1993) study examining playfulness in human-computer interactions showed evidence of flow experiences having positive implications for learning in software use. Based on this notion, Kiili (2005) proposed the Experiential Gaming Model to use as a framework for examining the experience of flow in computer-mediated environments. This model highlights the importance of games with unambiguous feedback, as well as goals and challenges which are matched with the player's skill in order for the flow experience to occur, and for it to have a positive impact on learning, particularly within educational-based contexts.

Keller and Bless (2008) experimentally examined flow and mechanisms of intrinsic motivation in a computer game task. The game *Tetris* was manipulated across conditions of varied skill-challenge balances (i.e., equal skill and challenge; higher skill than challenge; and higher challenge than skill-level). The results suggested that a compatible skill to challenge balance (i.e., equal skill and challenge) is most effective in facilitating intrinsic motivation in gaming. This presents an account of the associations between motivations for gaming and positive flow experiences, and suggests that enjoyment of gaming is both an outcome and a motivation.

The importance of the intrinsic nature of activities in facilitating flow is clearly demonstrated by the literature. However, flow is a highly subjective experience which has personal significance to a particular individual, when engaged in a particular activity. This means that generalisations about the experience of flow for particular activities are problematic as they are highly dependent upon the individual's experience of the activity, based on motivation and enjoyment. The experience of intrinsic interest and enjoyment can then foster an overall sense of well-being.

Two perspectives have been used to account for the way in which flow can have consequences for psychological well-being: the hedonic and the eudaimonic approaches (Waterman, Schwartz & Conti, 2008). The hedonic perspective postulates that flow can directly impact on well-being through the experience of happiness in the current situation. It conceptualises well-being as the happiness experienced through positive mood. Alternatively, the eudaimonic approach suggests that it is the indirect route of motivation to master challenging tasks which impacts on perceptions of well-being and determines life-long growth (Moneta, 2004). This provides a much broader

approach to the study of the factors involved in promoting psychological well-being. The following section further examines the theoretical and empirical evidence of the associations between flow and psychological well-being.

2.5.6. Flow and Psychological Well-being

Diener (1994) conceptualised subjective well-being as a global, positive reaction to an individual's life. Well-being is said to comprise of an affective component and a cognitive component (Diener, Suh, Lucas & Smith, 1999). The affective component refers to how frequently an individual experiences positive and negative feelings, and the cognitive refers to the judgement of life satisfaction (e.g. quality of life and self-fulfilment) as a product of the wider social contexts. Life satisfaction is traditionally measured through self-report items examining an individual's subjective perception of their satisfaction with various aspects of their life (e.g., state of health, accommodation). These two perspectives ultimately suggest a strong affective component to well-being, and imply that general mood state is important when considering people's perceptions of general happiness and satisfaction (Ryff, 1989).

Theoretical and empirical evidence has established a positive link between the experience of flow and levels of psychological well-being in both work and leisure contexts (Bryce & Haworth, 2002; Clarke & Haworth, 1994; Evans & Haworth, 1991; Haworth & Evans, 1995; Haworth & Hill, 1992). This link has been proposed to be derived through the heightened perceptions of enjoyment associated with experiences of flow, and their impact on enhancing perceptions of positive affect. In fact, Csikszentmihalyi (1975) observed that when depriving people from microflow experiences (flow experiences when undertaking minor daily activities such as doodling and day-dreaming), this showed to lead to them reporting greater tiredness, lower health and lower relaxation states. From this, he suggested that these microflow activities functioned as a means of maintaining alertness, relaxation and positive perceptions of oneself.

Haworth and Hill (1992) showed that positive experiences such as enjoyment from involvement in activities were positively correlated with measures of mental health and psychological well-being. Similarly, Bryce and Haworth's (2002) study on male

and female office workers demonstrated that enjoyable flow was associated with psychological well-being in work and leisure contexts.

Evans and Haworth (1991) compared employment status in young adults and the consequences for flow and psychological well-being. Findings showed that unemployed individuals were less likely to experience flow and had lower levels of psychological well-being than the employed group. Clark and Haworth (1994) studied the ratio of challenge and skill in determining flow in college students and whether high flow was associated with psychological well-being. Their findings revealed that when skill level exceeded moderate challenge, this best predicted the experience of flow, and that those individuals who experienced enjoyable flow scored higher on psychological well-being measures. Haworth and Hill (1992) conducted research on work, leisure and psychological well-being in young adults. Using the Experience Sampling Method (ESM), they showed that enjoyment in leisure and work was significantly associated with psychological well-being. They also found that flow experiences of an equal ratio of perceived skills and challenge were the most enjoyable and tended to occur in work rather than leisure.

Steele and Fullagar (2009) studied flow through student engagement in academic work activities, and examined how work characteristics (e.g. skill variety, task identify, task significance, feedback and autonomy) influenced attitudes and behaviour. Their findings revealed significant associations between work characteristics and flow, and suggested that flow significantly predicted students' psychological well-being.

Leisure theory and research therefore presents evidence of the way in which flow experiences are associated with positive indicators (e.g., positive affect, enjoyment) and also wider aspects of psychological well-being. When considering gaming within the context of leisure, it seems reasonable to assume that these experiences and outcomes will be equivalent to other leisure activities. Using the flow framework to examine gaming is also useful since the nature of flow means it is also inherently related to intrinsically motivated behaviour. In this way it can be examined in relation to the motivations for playing videogames. A review of the research literature is presented in the following section.

2.6. Gaming motivations

Videogaming, like any other activity (e.g. TV viewing, sport), is a form of motivated and voluntary action (Jansz & Tanis, 2007). The success of a videogame is largely dependent on how motivating and enjoyable it is for players. It is therefore necessary to examine the motivations behind videogame engagement and what gamers expect to derive from their gaming experiences (Bartle, 2004). Ryan, Rigby and Przybylski (2006) suggest that voluntary participation in gaming implies high autonomy for players which facilitates in-game perceptions of freedom. This sense of freedom itself can be a strong motivation for gaming, and can help satisfy gamers' feelings of autonomy (Ryan et al., 2006).

Gaming, like other forms of leisure behaviour, is a heterogeneous activity and there is likely to be a diverse range of gaming motivations for engagement in different circumstances. Research suggests that people engage in leisure activities to meet new people, to acquire new skills and for distraction from everyday stressors (Iso-Ahola, 1989). Similarly, research suggests that people play videogames as a form of escapism (Sherry, 2004). Players can also derive a great deal of fun from their gaming experiences (Killi, 2005a; Sweetser & Wyeth, 2005), experience excitement (Wood, Gupta, Derevensky & Griffiths, 2004), and general enjoyment (Rieber, 1996). These distinctly intrinsic motivations indicate that gamers typically play videogames in order to satisfy such intrinsic needs for fun and enjoyment. Experiential states derived through gaming, such as flow and enjoyment have also been examined (Choi & Kim, 2004; Hsu & Lu, 2004; Koo, 2009). These experiences have been shown to be associated with game loyalty (Choi & Kim, 2004; Lee & Larose, 2007), gaming intentions (Hsu & Lu, 2004), and have positive consequences for mood (Klimmt, Hartmann & Frey, 2007; Smith, 2007). This suggests that the positive experiences derived through gaming are a key motivation for engaging in the activity.

2.6.1. Typologies of gamer

Research has also studied gaming motivations through identifying multi-dimensional motivations associated with gaming behaviour. Recent research examining gaming motivations has identified different types of players (Bartle, 1996, 2004; Cole & Griffiths, 2007; Schuurman, De Moor, De Marez & Van Looy, 2008; Utz, 2000; Yee,

2007). Bartle (1996) proposed four types of MUD (Multi-User Dungeon) player; *achievers, socialisers, explorers* and *killers*. The main objective for *achievers* is to accumulate points and accomplish levels. *Socialisers* play for the opportunities of interacting with other gamers. *Explorers* experience enjoyment from discovering new worlds and figuring out how things work in the virtual world. *Killers* find pleasure from eliminating opponents. The gaming experience of these players is largely determined by the way they engage with the content of the game, and whether the particular motivation for gaming is fulfilled through gameplay. According to Bartle (1996, 2004), in order for new videogames to be successful, they must be able to gratify all four types of player.

Based on Bartle's (1996) classifications, Yee (2006) suggested five main factors which motivate online gamers: *relationships, manipulation, immersion, escapism* and *achievement.* From these, three main categories of player were identified: *social players, achievement-seeking players* and *immersion players. Social players* are motivated by their need to interact with others in an online setting. *Achievement-seeking players* tend to focus on competitive elements, mastery and gaining power within the game. Immersion players play games as a way of escaping reality and real-life problems. Williams, Yee and Caplan (2008) provided further support for these three categories, with achievement-seeking being the strongest predictor of gameplay time. The three themes of immersion, social and achievement will be considered in greater detail below.

Social-orientated motivations
Gaming should not be considered purely a solo activity, although this is its common stereotypical conception. Although videogames can be played individually, gaming can also be a social activity in which social interactions and communications occur amongst players. The development of online gaming and multiplayer options facilitate gamers' opportunities to engage in social gaming both online and offline. These can help fulfil social needs (e.g., social belonging) which many gamers strive towards in gaming (Griffiths, 1997a; Selnow, 1984).

Social interaction is identified in the literature as both a motivational and experiential factor in gaming (Colwell, 2007; Kim & Ross, 2006; Lo, Wang & Fang, 2005a;

2005b; Selnow, 1984; Sherry & Lucas, 2003; Sherry, Lucas, Greenberg & Lachlan, 2003; Wood et al., 2004), particularly in multi-user environments (Griffiths, Davies & Chappell, 2004a; Yee, 2006, 2007). Social interaction in gaming can be used as a way of communicating with existing friends, and can be an effective way of making new friends (Yee, 2006, 2007). Research supporting the social value of gaming includes an early study by Harris and Williams (1985), who showed that approximately one quarter of the school children surveyed played because their friends did. Furthermore, it has been suggested that gamers prefer to play with other players rather than alone (Cupitt & Stockbridge, 1996; Durkin & Aisbett, 1999; Kubey & Larson, 1990; Vorderer & Ritterfield, 2003). This provides evidence of the positive social value of gaming for gamers, and the potential of the context in which gaming occurs to be a key determinant of any potential positive consequences.

Recent research has documented the importance of interpersonal communication for Massively Multiplayer Online Role-Playing Games (MMORPG) players (Cole & Griffiths, 2007; Filiciak, 2003, Ng & Wiemer-Hastings, 2005). MMORPGs differ from traditional videogames as the virtual world in which they are played continues to run, regardless of who is playing. MMORPGs are primarily a social-based phenomenon, in which large numbers of users interact with one another over the Internet. The introduction of MMORPGs established one of the first interactive mass medium platforms which incorporated both entertainment and communication. Players reported enjoyment of this particular form of gaming because of the involvement in a social community and the ability to make friends and share personal information while remaining anonymous. This gaming experience is therefore distinct from other gaming situations (e.g., solo play) as the social components create a unique gaming experience. Furthermore, evidence from Smyth (2007) suggests that gameplay in MMORPGs is distinct from other gaming experiences, and that it has different consequences for psychological and social factors (e.g., greater acquisition of new friendships and enjoyment in MMORPG players compared to "traditional" gamers).

Achievement-orientated motivations
The challenging and competitive elements of videogaming can also be motivations for playing videogames (Colwell, 2007; Eglesz et al., 2005; Kim & Ross, 2006; Sherry, 2004; Sherry & Lucas, 2003; Sherry, Lucas, Rechsteiner, Brooks & Wilson, 2001;

Sherry, De Souza, Greenberg & Lachlan, 2002a), particularly for male gamers (Jansz & Tanis, 2007). Furthermore, the satisfaction which can be derived from accomplishing challenges can enhance perceptions of competence and facilitate motivation to play games (Ryan et al., 2006; Wigand, Borstelmann & Boster, 1985). The sense of accomplishment which can be derived from "beating a game" or other players, and successfully completing the challenges which a game offers, can engage gamers in periods of gameplay.

Chang and Zhang (2008) describe the motivating factors for online gaming as the need for intrinsic rewards and fulfilment of psychological needs (e.g., sense of success through fulfilling gaming achievements). This is consistent with Self-Determination Theory (SDT: Deci & Ryan, 1980, 1985, 2000; Ryan & Deci, 2000a) in which intrinsic motivation can be facilitated through the fulfilment of the psychological needs for autonomy, competence and relatedness. In this case, perceptions of competence can be enhanced through gaming achievements. Fulfilment of needs for competence, autonomy and relatedness is important since the resulting satisfaction has been shown to lead to greater enjoyment and a higher likelihood of gameplay (Ryan et al., 2006). The achievement-seeking motivation for gaming has been shown to be apparent in numerous studies (Chang & Zhang, 2008; Yee, 2006) and has emerged as a motivation for keeping gamers playing.

Immersion-orientated motivations
Videogaming is different from most other forms of entertainment because of its interactive nature. The opportunities for exploring new worlds, role-playing a unique character, and eliminating opponents in an environment with no real adverse consequences, are factors which can explain the appeal of videogames. These opportunities themselves have been shown to be key motivating factors in videogame use. For example, Sherry and colleagues (2001, 2003) found that opportunities for diversion and fantasy were important gaming motivations for young adults. Similarly, Kim and Ross (2006) found these were key motivations for playing sports videogames. Other important motivations include the opportunities for escaping real-life and to alleviate stress (Eglesz et al., 2005; Wood et al., 2004; Yee, 2006, 2007).

Escapism. A commonly cited motivation for videogaming is that it can help players escape from reality and the stresses of everyday life, and immerse them in a virtual world (Koo, 2009; Selnow, 1984; Sherry, 2004; Wan & Chiou, 2006; Yee, 2006, 2007). Though it is a form of immersion, escapism is conceptually distinct because gaming is used as a distraction from real-life, rather than simply to be immersed in the virtual world. This motivation has been shown to be more important for frequent compared with less frequent gamers (Wood et al., 2004). Further evidence supporting gaming as a form of distraction includes research on adolescents who have been shown to play games to pass time and for escapism (Griffiths, 1991, 1997a, Griffiths & Hunt, 1998, Philips, Rolls, Rouse & Griffiths, 1995; Selnow, 1984).

Stress reduction. Another common gaming motivation is to provide a means of stress relief and/or alleviation of negative mood such as frustration (Colwell, 2007; Griffiths, 1991; Eglesz et al., 2005; Wigand et al., 1985; Wood et al., 2004). Recent research by Greenwood and Long (2009) has identified an emotional component in individuals' engagement with different forms of media (e.g., listening to music, watching TV and playing videogames), suggesting mood as a key determinant of the type of media with which individuals engage. Individuals tend to report listening to music when experiencing both positive and negative mood, compared to watching TV when experiencing boredom. The use of media as a mood regulation strategy suggests the need to examine the role of emotion on motivations for videogame play. Mood Management Theory can provide a theoretical underpinning for such findings (Zillman, 1988a, 1988b, Zillman & Bryant, 1985). This theory posits that individuals use entertainment as a means of regulating mood states and arousal. For example, individuals experiencing feelings of boredom may play videogames as a way of increasing arousal and gaining stimulation from the gaming experience. Alternatively, individuals experiencing negative mood may play videogames as a means of alleviating negative feelings. Empirical evidence supports this assumption as stress relief has been found to be a key motivation for gaming in children and adolescents (Eglesz et al., 2005; Wood et al., 2004), and that playing violent videogames can provide mood management in dealing with stress and depression (Colwell, 2007; Olson, Kutner & Warner, 2008). From the evidence it is apparent that gamers engage in gameplay as a means of immersing themselves in a fantasy world to discharge negative feelings.

The literature therefore suggests that people play videogames for the positive experiences they can derive through gameplay, as a means of alleviating negative emotions, socialising with others and to promote feelings of accomplishment through mastering challenges. This is consistent with motivations for engaging in leisure pursuits. It suggests that gaming should be considered within wider leisure contexts as a way of exploring the potential positive experiences and associated benefits. Since the literature has shown the flow framework to be particularly useful for exploring leisure experiences and the associated positive outcomes, it seems reasonable to utilise this as a theoretical framework for the current research. Further, because flow has inherent links with intrinsically motivated behaviour, it is also useful for the study of gaming as a form of motivated action.

Examining flow experiences in relation to games with differing levels of violence, and the associations with personality variables can provide an insight into the potential effects of exposure to violent game content. Given this, the current research examined the associations between aggressive personality, in-game flow experiences and mood outcomes to further extend the literature, to assess the way dispositional factors interact with the nature of gaming experiences. Understanding these interactions could offer insight into the potential range of gaming outcomes.

Exploring the meanings which can be derived through gaming would further extend the academic literature. A means of undertaking this comprises a qualitative approach which explores the idiographic nature of these experiences. Adopting this approach is particularly important due to the fact that gaming is a highly personal experience which can be characterised by the relationship between a player and a game (Calvillo-Gάmez, Cairns & Cox, 2010). Given this, the current research also utilised qualitative methodologies to examine these particular experiences.

Overall, the current research used mixed-methods to examine the motivations, experiences and outcomes of playing videogames, the influence of personality traits and gaming contexts on these outcomes, and the meanings which gamers' derive through their gaming experiences.

CHAPTER 3: METHODOLOGY

Introduction

The previous chapter reviewed the literature on the motivations, experiences and effects of playing videogames, with particular consideration of leisure theory and research as an appropriate framework for the current research. This chapter evaluates the methodological approaches of the current research and how it has developed from previous studies. This commences with a rationale of the mixed methods research approach used, followed by a review of the particular qualitative and quantitative methods used (i.e., focus groups, online questionnaires and experiments). There is particular focus on examining the shortcomings of existing experimental research, and recommending ways of improving and developing this method in the future. The chapter concludes with an overview of the methodological approach of the current research.

3.1. Mixed method approach

Although there are concerns over the lack of convergence of qualitative and quantitative research approaches, due to their different epistemological assumptions (Brannen, 1992), some scholars highlight the effectiveness of mixed methods for complimenting the research process (Brannen, 2005). Quantitative studies can often initially identify relevant issues or samples to pursue for future more in-depth qualitative research. This can be particularly useful for making sense of statistical data. Conversely, qualitative studies can start the research process by identifying core ideas and developing theoretical concepts, and thus formulating hypotheses which can be further tested using quantitative methods (Kelle, 2006). By nature, quantitative methods are confirmatory and can verify theory, compared to qualitative methods which are more exploratory and can generate theory (Teddlie & Tashakkori, 2003). The relative methodological strengths and limitations of each approach can overlap in a compensatory way (Johnson & Turner, 2003; Kelle, 2006). For example, mixed methods can simultaneously provide generalisation and in-depth understanding by gaining an overview of the relationships between specific variables from larger samples, whilst also understanding them through a more detailed examination with smaller samples (Bazeley, 2002). This formed the basis for the key underlying epistemological assumptions of the current research. That is, critical realism (or post-

positivism) highlights the importance of multiple measures as a means of compensating for different types of errors in order to provide an insight into reality. The current research adopted this compensatory approach when dealing with the relative weaknesses of different methodological approaches. More specifically, a critcal realism perspective provided a suitable means through which to provide an exploratory focus of investigation (Clark, nd). Further, critical realism provides a suitable approach for examining explanations behind real world outcomes. Given that the current research aimed to *understand* a range of gaming outcomes, this approach complimented the objective to move beyond current research perspectives which simply *identify* specific outcomes.

A mixed methodological approach was utilised for the current research as a way of providing a comprehensive account of the range and depth of videogame experiences. The use of quantitative methods, particularly online questionnaires, enabled access to a wide range of gamers, demonstrating diversities in gaming experiences across individuals, and providing evidence of how these potentially influence outcomes of gaming. This allows greater conviction when generalising the research findings since the nomothetic nature of the analysis is at the level of the population. In contrast, the idiographic nature of the focus groups and open-ended response items examined the more individual aspects of playing videogames to identify variations and diversities in motivations and experiences, depending on the specific game and context in which it was being played. Further, this methodology was useful for addressing issues such as gamers' attitudes towards game violence and the meaning they derive from gaming, which are difficult to study quantitatively.

3.2. Qualitative Methodology (Focus Groups)

Qualitative research methods in general can effectively control the validity of the findings in three ways. Firstly, the nature of the research context allows participants to challenge the researcher's assumptions of the meanings derived through the research process (Willig, 2008). Secondly, qualitative research is conducted within real-life settings, as opposed to quantitative experimental research, for example, which often takes place in the laboratory. This ensures a much higher ecological validity of the research. Finally, researchers are able to continually review their role within the

research process and minimise the likelihood of misinterpretations of meaning and increase validity (Willig, 2008).

Focus groups are a useful source of data. They provide the interactions among group members as evidence of understandings and meanings of the topic of interest (Willig, 2008). They can also identify a range of views on certain topics, and so can be useful when exploring attitudes on divergent issues. In addition, they can also draw out the idiosycracities of individual's own meanings and experiences, to address the potential variations among group members on particular issues. This is particularly relevant for studying gaming experiences since they are highly personal to the individual player, and focus groups can facilitate discussions among gamers which draw out similarities and differences in their subjective gaming experiences. Further, they can effectively draw out the personal meanings of gaming to gamers, which are difficult to access through quantitative methods. Although phenomenological research is traditionally conducted in the form of a one-to-one interview, it has been suggested that focus groups can extend the notion of the "individual lived experience" by stimulating discussion and reveal new perspectives among others (Bradbury-Jones, Sambrook & Irvine, 2009). Given this, focus groups provide a suitable context in which to examine the idiosyncratic nature of gaming experiences, whilst also allowing for new and emergent ideas to formulate through the group context.

Rettie (2001) outlined the effectiveness of focus groups for examining flow experiences as they reveal subjective perspectives within a social context of spontaneous ideas. The importance of the social context of focus groups was supported by Kitzinger (2000) who stated that they can provide an opportunity for people to explore and share ideas more effectively than in one-to-one settings. This can then help them to form a shared understanding of their experiences, and allow for common themes to emerge from the discussion. This notion is supported also by Pope and Mays (1995) who suggested that qualitative methods, such as focus groups, can provide an opportunity for the meanings, experiences and views of all participants to be expressed. In addition, focus groups can allow a more holistic depiction of individuals' understandings of the research questions (Brannen, 2005).

There are, however, some limitations to the focus group method. Due to the interactive nature of the group discussions among participants and the researcher, there is a potential for the researcher's loss of control over the discussions compared to other methods (e.g., one-to-one interviewing). It is also often difficult to identify an individual group member's own views within the focus group context. Because participants are within a specific context, this can result in individual meanings being lost in the wider group discussions. Finally, focus groups can often present issues of practicality, in relation to organising and managing a number of group members, and also ensuring control over potential "dominant" group members. Issues relating to the dynamics of focus groups are addressed by Farnsworth and Boon (2010). They identify that group interactions and dynamics are central to influencing participation and potential themes of group discussions. This infers caution when generalising findings beyond focus group participants.

Despite these limitations, the focus group method was deemed most suitable for parts of the current research. Being able to construct an understanding of the gaming experience, and addressing other issues, such as the importance of the social context, would be difficult using other methods. Further, because the flow framework forms the theoretical basis for the current research, a qualitative approach complements the subjective nature of studying such experiences. This approach encourages reflection on subjective flow experiences, and can identify the personal meaning of enjoyable gaming experiences for individual gamers. It can also examine the personal and dynamic nature of the interactions between the individual gamer and the game. This is important considering Csikszentmihalyi and Csikszentmihalyi's (1988) suggestion that to understand the quality of the experience, one must know the nature of the interaction between both the person and the conditions of the environment. The current study therefore utilised focus groups as a means of understanding the personal and dynamic nature of gaming experiences in a way which would be otherwise difficult to examine through quantitative methods.

3.3. Quantitative methodology (Online Questionnaires)

Quantitative data provides a broad understanding of particular research issues. Data were collected using online questionnaires to gain information on demographics,

gaming preferences, motivations, experiences and consequences of playing videogames.

Using the Internet for data collection has been reviewed by a number of researchers (Fan & Yan, 2010; Gardner, n.d; Wood, Griffiths & Eatough, 2004). Wood et al. (2004) reviewed the advantages and disadvantages of online data collection in this area, and concluded that it was a useful way of studying the psychosocial factors associated with gaming. This method also provides greater access to a wide range of participants and a more representative sample of videogamers, allowing greater generalisability of the findings. Further, it is a financially and time effective means of data collection and data storage is far more convenient. Using the Internet for data collection has also been claimed to reduce the likelihood of responses being influenced by social desirability (Hussain & Griffiths, 2009), and can result in higher response rates (Kaplowitz, Hadlock & Levine, 2004).

The associated disadvantages with this methodology are that the researcher loses some control over the data collection process, particularly the ability to easily deal with queries or trouble-shoot problems which may arise. Furthermore, control over multiple and incomplete responses is limited, although some research has found significantly fewer missing data in online questionnaires than in traditional paper-based formats (Stanton, 1998; Truell, Bartlett and Alexander, 2002). To overcome multiple submissions, the current research used a statistical function to seek duplicate responses.

The questionnaires were uploaded to the Internet using the software packages *Quask* (Study 1 and Study 2 pilot) and *SurveyGizmo* (Study 4). The questionnaires were advertised to Game Design and Computer Game Development students enrolled at UK Universities and posted on numerous gaming websites (for a comprehensive list of the websites used, please refer to Appendix 1). On completion of the data collection process, the data was exported to SPSS v-17 for analysis.

3.4. Quantitative methodology (Experiments)

A large majority of videogame research has utilised experimental methods to manipulate game violence, or other structural aspects, to examine their influence on

outcome measures (e.g., hostility, enjoyment; Barlett, Harris & Bruey, 2008; Przybylski, Ryan & Rigby, 2009). This ensures control between the game conditions to examine the influence of the independent variables on the measured outcomes. Further, the nature of the laboratory setting reduces potential "noise" in the research (e.g., differences in consoles, types of game, social dynamics) which may be present in real-life gaming contexts. This can ensure further control for the study variables.

Existing experimental research on videogames, however, has recently come under scrutiny based on a number of identified methodological shortcomings (Ferguson, 2007a; 2007b; 2008). Given this, the design stage of the experimental study undertaken consisted of a review of the existing limitations to ensure that these were addressed as far as possible. The following sections outline a number of key issues which were identified within existing experimental gaming studies. These include; measures of aggressive behaviour, poor control of videogames between experimental conditions; short gameplay periods; and unrepresentative sampling. Each of these will be discussed in greater detail below.

3.4.1. Validity of aggression measures

A large majority of experimental gaming research examines the differences between violent and non-violent videogame exposure on aggressive behaviour (e.g., Anderson & Dill, 2000; Anderson & Murphy, 2003). One commonly used method for measuring aggressive behaviour in the laboratory is the Taylor Competitive Reaction Time test (TCRTT). Participants are led to believe they are administering electric shocks (or noise blasts) to another participant. The length and/or intensity of the shocks or noise blasts are recorded and are used as an indication of aggressive behaviour of research participants.

Ferguson and Rueda (2009) assessed the validity of the TCRTT for aggression. Their findings revealed that the measure did not sufficiently correlate with real-world acts of aggression (e.g., violent criminal behaviours, domestic violence), or with measures of trait aggression (e.g., Aggression Questionnaire; short form), in young men. This is supported by other studies which have questioned the reliability and validity of aggression measures both for cross-sectional and laboratory studies (Ferguson, Rueda & Cruz, 2008b; Ritter & Eslea, 2005; Tedeschi & Quigley, 1996). Further, it has been

suggested that measures such as the TCRTT reflect competitive rather than aggressive responses. (Krahé, 2001).

In addition, the construct validity of laboratory measures has also been scrutinised for the lack of measurement of both reactive and proactive forms of aggression (Tedeschi & Quigley, 1996). Most physical laboratory measures (e.g., teacher-learner protocols) incorporate procedures which involve research participants being subjected to unprovoked verbal aggression, to which they are given the opportunity to retaliate, as a measure of reactive aggression. This does not include an examination of proactive aggression, which forms a key theoretical component of the aggression paradigm (Tedeschi & Quigley, 1996). This argument, however, has been challenged on the basis that participants in TCRTT procedures are always allowed to be successful in the first trial, resulting in them administering unprovoked aggressive responses in the first instance (Krahé, 2001).

A further issue with laboratory aggression paradigms is that there is little consideration of behavioural intentions or motivations for aggression (Tedeschi & Quigley, 1996). Most people are not motivated to be aggressive to others, and so being required to act aggressively in laboratory settings is not necessarily consistent with most people's moral or motivational perspectives. Further, laboratory measures of aggression are limited in their ability to examine severe manifestations of aggressive behaviour (Krahé, 2001), and can be somewhat game-like in nature. This suggests the need to reconsider the laboratory aggression paradigm and perhaps extend it to examine the choices of alternative actions of research participants to provocations by others (Tedeschi & Quigley, 1996). This could provide a more valid representation of the nature of people's aggressive intentions, reactions and subsequent actions.

Based on these issues with laboratory measures of aggression, parts of the current research examined aggressive behaviour through alternative means. That is, rather than utilising a quantitative, experimental approach, the current research examined the potential influence of violent game content on real life aggressive behaviour through qualitative methods. This was achieved by assessing gamers' attitudes to potential

negative outcomes. This method was deemed more suitable, as it was not subjected to methodological limitations which can be common to experimental research.

3.4.2. Gameplay Period

Experienced gamers often invest long periods of time in gaming sessions in order to experience the full potential of a game. A large proportion of existing experimental research uses relatively short time periods for participants to play selected videogames. The average time period used by researchers is approximately 10 to 15 minutes, and most games used in studies are typically commercial games (e.g., *Duke Nukem, Mortal Combat*) which require greater play periods to adequately progress in the game. The extent to which experimental gaming sessions can approximate the everyday psychological experience of engagement with games is questionable, and short play periods are unlikely to provide sufficient time to adequately test the claimed effects of exposure to violent content. It is interesting to note that Ferguson et al. (2008a) used a significantly longer time period of 45 minutes, and did not observe any significant differences in aggressive behaviour between violent videogame and non violent videogame conditions, using self-report and behavioural measures. Haninger and Thompson (2004a) also suggest the need to extend the gameplay period in lab studies in order to assess whether the effects of violent content escalate with time. Examinations of processes such as arousal in gaming require an extended time period of gameplay (Sherry, 2001). This suggests that using extended gameplay periods would increase the realism and ecological validity of the gaming experience in experimental designs. In order to overcome such limitations, the current research utilised a 40 minute gameplay period, which was chosen to allow for gamers to "get into the game" whilst not being too time-consuming for participants.

3.4.3. Control of Videogames

Videogames are extremely complex in structure and dynamics, making the choice of games in experimental studies difficult. Previous experimental studies have been methodologically limited as the videogames chosen for violent and non-violent game conditions have not, in many cases, been adequately controlled for all the game characteristics (e.g., level of boredom, frustration, difficulty). The importance of game control between experimental conditions is highlighted by Bryce and Rutter (2006) who suggest that differences in game characteristics (e.g., complexity, genre) between

conditions restricts the ability to isolate the effect of game violence on subsequent measures of aggressive feelings, thoughts and behaviour. Research has also shown differential effects of particular game characteristics on physiological arousal. For example, storylines in games have been found to induce higher physiological arousal than no storyline (Schneider, Lang, Shin & Bradley, 2004). Further, recent evidence has shown that greater complexity of game controls (e.g., computer keyboard) leads to lower game mastery, which results in increases in aggression from pre to post test measures (Przybylski, 2009).This suggests the importance of acknowledging the potential differences between different games, and the influence of particular game aspects on gaming experiences and outcomes. In studies which have used highly distinct games for the violent and non-violent game conditions, the differential findings could be due to differences in game experiences (e.g., higher physiological arousal) which can result from different game aspects.

These issues raise concerns when considering the validity of previous experimental research findings, in which poorly controlled games were used. Despite the fact that the chosen games may differ on levels of violence, the apparent differences between them on other game factors questions the validity of their use. For example: When Bartholow and Anderson (2002) experimentally examined the effect of videogame violence on aggressive behaviour, the two games they used were *Mortal Kombat* (violent condition) and *PGA Tournament Golf* (non-violent condition). These games are qualitatively different in terms of the game objectives, difficulty, action and storyline. It is possible that these differences could account for the differences in measured outcomes between the two conditions, making it difficult to definitely claim that the violent content was the influential factor. Considering that research has shown that action-orientated games result in greater physiological arousal than non-action-orientated games (Arriaga, Esteves, Carneiro & Monteiro, 2006), it is likely that the distinctions in action content between the two games could have influenced differential outcomes between the experimental conditions.

If research aims to examine the experiences and effects of violent content, it must select games with different levels of violence whilst simultaneously ensuring control over games on all other game aspects. These aspects can include features at a basic level such as graphics, and extend to more complex characteristics such as storyline or

level of challenge. In order to overcome the limitations of previous gaming research which have provided minimal evidence of control between games, the current research conducted a pilot study to identify the similarities and differences between games on a number of aspects (e.g., level of action, realism), and ensure greater control between game conditions within the main experimental study. This pilot study involved asking gamers to rate recently played videogames on numerous game aspects (e.g., enjoyment, level of activity, action, frustration). The results for the most frequently rated games were consolidated and statistical comparisons were conducted to identify two games which were rated as statistically different on violence and aggression, but were not significantly different on all other game aspects. From these comparisons, two games were chosen as being suitably controlled. A more detailed account of this pilot study is provided in Chapter 5.

This research therefore addressed some of the shortcomings of previous research by ensuring control between game conditions, whilst also using up-to-date games and technology to examine gaming experiences and outcomes. The use of modern technology is particularly important since evidence suggests more pronounced effects for presence and arousal in newer games compared to older ones (Ivory, 2006; Ivory & Kalyanaraman, 2007). This can therefore examine the experiences and outcomes associated with games which are popular on the commercial market.

3.4.4. Sampling

A large proportion of previous experimental videogame research has used unrepresentative samples and often has not even accounted for the previous gaming experience of participants. Previous experimental videogame research has typically used undergraduate psychology students (e.g., Anderson et al., 2004; Bushman & Anderson, 2002). Whilst convenience sampling is common in psychological research, it is not necessarily methodologically suitable for videogame research. Using non-gamers is problematic as their skill level is likely to be minimal compared to gamers, and this lack of experience and competence is likely to prevent adequate progression in the game. Chumbley and Griffiths (2006) found that players with more gameplay experience showed lower feelings of frustration than less experienced gamers. The observed increase in aggressive cognitions, affect and behaviour found in previous research using non experienced gamers could result from the frustration experienced

due to lack of intrinsic motivation, experience and associated skills. Interestingly, research has shown that game frustration can influence dimensions of aggressive affect (Anderson & Carnagey, 2009). This questions the generalisability of findings from studies using samples of non-gamers to extrapolate gaming experiences and outcomes outside the lab, and demonstrates the need to use representative samples of gamers in empirical research.

A further issue arising from unrepresentative sampling is the inability to accurately reflect real-life usability of the videogame experience. Usability in this context refers to the functionality of a videogame, and how well the user is able to sufficiently execute the appropriate tasks. Malone and Lepper's (1987) taxonomy of motivations to enhance enjoyment and usability of videogames includes four main heuristics: challenge, fantasy, curiosity, and control. This suggests that usability will be inhibited in non-gamer samples as the challenge and control of the game is likely to be too high for their skill level. This will decrease feelings of enjoyment and fun in gameplay, and potentially increase frustration, thereby not reflecting a real-life gaming experience.

The use of undergraduate psychology students is also problematic due to the fact that on average, they tend to be female, compared to gamers who tend to be male (Griffiths, Davies, & Chappell, 2003; Williams, Yee & Caplan, 2008). These gender distinctions can influence differential outcomes since men and women have been found to have different motivations for playing videogames and to experience videogames differently (Chumbley & Griffiths, 2006; Kafia, 1996; Yee, 2007). According to the Media Analysis Laboratory (1998), boys associate more positive emotions with gaming (e.g., excitement and pleasure) whereas girls experience more negative ones (e.g., boredom and frustration). Kafia (1996) has also demonstrated a gender difference in children's goals in gaming which suggested that girls were more focused on cooperation and communication in the game, whereas boys were more focused on competition, mastering tasks and completion. Cooper and Mackie (1986) showed more pronounced effects on aggressive play behaviour in girls than in boys following videogame exposure, and Chumbley and Griffiths (2006) claimed that females are generally less skilful than males in playing videogames, and that lower proficiency may moderate the effect of game difficulty on frustration (Chumbley &

Griffiths, 2006). Variations in gaming preferences and experiences by gender could therefore potentially influence the outcomes of exposure to violent game content.

The motivations of gamers and non-gamers for participating in gaming research may also differ. Many studies offer course credit for participation, and non-gamers may therefore be largely motivated to participate for extrinsic reasons. Whilst gamers may also be similarly motivated, they may be more likely to participate for intrinsic purposes (e.g., personal rewards through gaming). As gaming behaviour is voluntary and the autonomy of gamers is typically high outside the laboratory (Bartle, 2004), using samples of non-gamers is unlikely to replicate the intrinsic motivating factors for gaming, and it is questionable whether the experiences and consequences of gaming will be equivalent between these samples.

To address the limitations of previous research, the current research used a homogenous sample of regular gamers to enhance the external validity which the majority of previous studies lack. Participants were recruited by targeted sampling from Game Design and Computer Game Development courses at UK Universities. The online questionnaire components also recruited gamers from online gaming websites and discussion boards, where the web-link to the questionnaire was advertised. Criteria for participation were that participants were aged 18 years or older and played videogames.

In summary, the current research used mixed methods (focus groups, experiments and online questionnaires) to examine the motivations, experiences and outcomes of playing videogames. This approach was chosen as a way of effectively addressing a number of different research questions, and providing a compensatory approach whilst acknowledging the potential limitations of the different methods.

CHAPTER 4: STUDY 1

4.1. Introduction

Chapter 2 outlined the use of a leisure perspective to examine the motivations, experiences and outcomes of playing videogames. This provides a broader framework to better understand the range of gaming experiences, and offers a different perspective to the media violence approach which is typical of a large majority of psychological research on gaming. Using the flow framework, adopted from a leisure perspective, can also account for the links between motivational and experiential factors, since flow is inherently associated with intrinsically motivated behaviour (Csikszentmihalyi, 1975).

Although some researchers have begun to examine motivations for playing videogames (Bartle, 1996, 2004; Cole & Griffiths, 2007; Schuurman et al., 2008; Utz, 2000), the existing evidence generally refers to typologies of gamer (Bartle, 1996; Yee, 2007), and experiential motivations (Choi & Kim, 2004; Hsu & Lu, 2004; Koo, 2009). Further, a large majority of these studies refer only to online gaming, resulting in an under-representation of offline gaming motivations. The current study targeted a broader demographic of gamer, and examined the frequency of gameplay in different contexts (e.g., solo, online cooperative). Further, previous studies also do not examine how motivations influence gaming experiences. This is important since the nature of the gaming experience is likely to be influenced by what the individual intends to "get out" of the experience. The current study, therefore, aimed to examine the influence of different gaming motivations on flow in gaming. Further, the use of open-response items on the questionnaire allowed a more in-depth examination of the range of motivations, and how these are related to gaming experiences.

Study 1 also used the flow framework to examine experiential factors facilitated by gaming to develop a further understanding of its potential positive effects. Whilst considering the motivations and experiences of gaming, the current study also aimed to explore how these may influence dimensions of psychological well-being. The rationale for examining this relationship is the body of evidence which shows that flow is positively related to heightened perceptions of psychological well-being

(Bryce & Haworth, 2002). To date, this has not been examined in the context of gaming therefore the current study addressed a gap in the existing literature.

The objectives of the study were to:

1. Identify the range of different motivations for gaming.

2. Examine the relationships between motivations and experiences of flow in gaming.

3. Examine the relationship between the experience of flow in gaming and psychological well-being.

4.2. Method

4.2.1. Design

A within-participants design was used in which an online questionnaire was completed by a sample of regular videogamers. Measures of gaming motivations, experiences, and psychological well-being were taken.

4.2.2. Participants

The sample consisted of 310 participants; (261 male, 49 female). The majority of the sample occupied the 18-25 years age category (65.20%). Participants were recruited by targeted sampling of a videogamer population, and the majority indicated they played games at least on a regular basis (79.70%).

4.2.3. Materials

The online questionnaire contained several sections. The first was a background questionnaire including items measuring gaming motivations, flow and enjoyment. The second section contained the Affective Well-being Questionnaire (Warr, 1990) and the Life Satisfaction Questionnaire (Warr, Cook & Wall, 1979). Please see Appendix 2 for a copy of the questionnaire.

Background Questionnaire: Motivations, experiences and flow

Demographic information and data on gaming preferences and habits were collected (e.g., hours per week, genre preferences). The questionnaire also asked participants to rate on a 5-point scale (1 = not at all, 5 = a lot), how often they experience enjoyment, and flow in gaming using the flow items (i.e., deep concentration, distorted sense of time, balance of skill and challenge, loss of self-consciousness, intense involvement, rewards, transcendence of self, clear goals and feedback) (Csikszentmihalyi, 1990). Reliability analysis revealed an alpha coefficient of .77, suggesting the scale to be adequately reliable. Participants were also asked to rate on a 5-point scale (1 = not at all important, 5 = extremely important), the importance of different gaming motivations (e.g., "I play games to reduce stress", "to socialise"). The questionnaire also provided an open answer section where participants were asked to provide details on their gaming motivations and experiences (e.g., "please provide further details of the feelings you experience when playing videogames").

Affective Well-being Questionnaire

The Affective Well-being Questionnaire (Warr, 1990) measured three sub-scales: pleasure, anxiety-contentment and depression-enthusiasm. For the pleasure axis, participants rated three items, regarding the degree to which they experienced enjoyment, satisfaction and happiness in their lives. Each item was rated on a 5-point scale (1 = "I am not happy at all", 5 = "I am extremely happy"). A score for pleasure was gained through taking the mean score for the three items. The anxiety-contentment and depression-enthusiasm scale required participants to consider how often they experienced certain affective states (e.g., gloomy, cheerful, and uneasy) in the past few weeks. Ratings were indicated on a 6-point scale (1 = never, 6 = all the time). The negative affective states were reversed scored. The mean score for each of the sub-scales was used for subsequent analyses. Warr (1990) showed that the coefficient alpha for the job-related anxiety-contentment scale was 0.76 and 0.80 for the job related depression-enthusiasm scale. Further studies have also shown high alpha coefficients for the scales of this measure. For example, Bryce and Haworth (2002) demonstrated that for anxiety-contentment, the alpha coefficients were 0.84 for females and 0.77 for males. For the depression-enthusiasm scale, the alpha coefficient was 0.79 for both males and females. For the work related pleasure scale, the alpha coefficient was 0.81 for females 0.91 for males. The alpha values calculated for the

current study revealed 0.44 for the pleasure axis, 0.29 for the anxiety-contentment sub-scale, and 0.10 for the depression-enthusiasm sub-scale.

Due to the low alpha values, the two sub-scales (anxiety-contentment and depression-enthusiasm) of the Affective Well-being Questionnaire were subjected to principal components analysis (PCA) using Varimax rotation. The suitability of the data for factor analysis was assessed prior to performing PCA. For the anxiety-contentment sub-scale, an inspection of the correlation matrix revealed the presence of many coefficients above .3. The Kaiser-Meyer-Oklin value was .70 and the Bartlett's test of Sphericity reached statistical significance ($p < .001$), supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of two components with eigenvalues exceeding 1, explaining 35.06%, and 30.16% of the variance respectively. Using Catell's scree test, it was decided to retain the two components for further investigation. Varimax rotation was performed to aid the interpretation of these two components. The rotated solution revealed a number of strong item loadings onto the two components. The solution explained a total of 65.18% of the variance, with Component 1 contributing 35.06% and component 2 contributing 30.13%.

Table 1: Varimax Rotation of Affective Well-being Questionnaire

Subscale	Item	Component 1 (Negative)	Component 2 (Positive)
Anxiety-contentment	Calm	-.13	**.83**
	Contented	.01	**.64**
	Relaxed	-.30	**.81**
	Tense	**.79**	-.10
	Worried	**.83**	-.13
	Uneasy	**.83**	-.12
Depression-enthusiasm	Cheerful	-.32	**.80**
	Enthusiastic	-.07	**.88**
	Optimistic	-.30	**.77**

Depressed	**.81**	-.32	
Gloomy	**.87**	-.14	
Miserable	**.87**	-.23	

Similarly, the correlation matrix for the depression-enthusiasm sub-scale was also revealed the presence of many coefficients above .3. The Kaiser-Meyer-Oklin value was .82 and the Bartlett's test of Sphericity reached statistical significance ($p < .001$), supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of two components with eigenvalues exceeding 1, explaining 39.56%, and 36.03% of the variance respectively. Using Catell's scree test, it was decided to retain the two components for further investigation. Varimax rotation was performed to aid the interpretation of these components,. The rotated solution revealed a number of strong item loadings onto the two components. The solution explained a total of 75.59% of the variance, with Component 1 contributing 39.56% and component 2 contributing 36.03%.

Life Satisfaction Questionnaire
The Life Satisfaction Questionnaire (Warr et al., 1979) contained 12 items, examining how satisfied participants were with specific aspects of their lives (e.g., social life.) Satisfaction was rated on a 7-point scale (1 = extremely dissatisfied, 7 = extremely satisfied). A total life satisfaction score was generated through combining the scores for items 1 to 11. The coefficient alpha for the Life Satisfaction Questionnaire has been shown to be 0.87 for males and 0.91 for females (Warr et al., 1979). The current study also revealed this measure to be adequately reliable, as an alpha coefficient of .87 was calculated.

4.2.4. Procedure
In order to reach samples of gamers, the online questionnaire was advertised to Game Design and Computer Game Development students at Universities in the UK and through advertising on popular gaming websites. Thematic analysis was used to examine the open-response items. The analysis process commenced with the

responses being read through a number of times to ensure a high level of familiarisation with the data. Following this, the transcripts were analysed, and main thematic categories were identified.

4.3. Results

4.3.1. Descriptive Results

Demographic information was collated from the details provided from the background questionnaire. Table 2 below shows descriptive analysis of demographic details, gaming habits and preferences of the sample. The majority of the sample was male (83.90%) who played videogames regularly (58.70%), for 5-10 hours per week (23.20%).

The descriptive analysis of the ratings for frequency of play in each gaming context revealed that playing solo was rated the most frequent context in which games were played (M = 3.99, SD = 1.05), with playing offline cooperatively being least frequent (M = 2.95, SD = 1.27). Other ratings for frequency of play were: playing *online cooperatively* (M= 2.97, SD = 1.47); *online competitively* (M = 2.98, SD = 1.41), and *offline competitively* (M = 3.10, SD = 1.21).

Table 2: Frequency analysis of demographics and gaming habits of the sample

Demographic		*N*	*Percentage*
Gender	Male	261	83.90%
	Female	49	15.80%
Age	< 18 years	31	10.00%
	18-25 years	202	65.20%
	26-40 years	73	23.50%
	41-50 years	2	0.60%
	60+ years	1	0.30%
How often	Regularly	182	58.70%
	Most of the time	65	21.00%
	Occasionally	56	18.10%

	Very rarely	5	1.60%
Hours per week	Less than 1 hour	10	3.20%
	1-5 hours	71	22.90%
	5-10 hours	72	23.20%
	10-15 hours	53	16.9%
	15-20 hours	41	13.20%
	20-25 hours	25	8.10%
	25-30 hours	10	3.20%
	30+ hours	26	8.40%
Console	Xbox 360	170	54.30%
	PSP	61	19.50%
	Sony PS3	58	18.50%
	Nintendo Wii	120	38.30%
	Sony PS2	110	35.10%
	Nintendo DS	113	36.10%
	Playstation	28	9.00%
	PC	91	29.40%

Dimensions of flow

Participants were asked to rate on 5-point scale (1 = not at all, 5 = a lot), how often they experienced aspects of flow during gaming. Table 3 below shows the means and standard deviations for the flow items. The highest mean score was for *deep concentration* (M = 4.04, SD = .93). The lowest mean score was for *lack of self-consciousness* (M = 2.46, SD = 1.31) and *transcendence of self* (M = 2.46, SD = 1.38). The overall mean score for *flow* was 3.57 (SD = .63).

To ensure consistency with previous theoretical assumptions on the occurrence of flow (Massimini & Carli, 1988), a correlation was conducted between the flow item "balance of skills and challenges" (M = 3.86, SD = .86) and an "enjoyment" score (M = 4.53, SD = .67). The results showed that there was a significant positive correlation between them (r = .47, $p < .001$), suggesting that an equal balance between the

challenge of the game and gamers' skills were positively associated with the enjoyment derived from the activity. This further suggests that flow was experienced in gaming, as flow theory assumes that the condition of a skill-challenge balance facilitates feelings of enjoyment.

Table 3: Descriptive analysis of the flow items

Flow Item	Mean	SD	Min	Max
Rewards from play	3.88	.93	1.00	5.00
Deep concentration	4.04	.86	1.00	5.00
Intense Involvement	3.79	1.05	1.00	5.00
Lack of self-consciousness	2.46	1.31	1.00	5.00
Distorted sense of time	3.27	1.28	1.00	5.00
Clear goals and feedback	3.84	.96	1.00	5.00
Balance of skill and challenge	3.86	.86	1.00	5.00
Transcendence of self	2.46	1.38	1.00	5.00
Mean Flow	**3.57**	**.63**	**1.33**	**5.00**

Psychological Well-being

The mean score for total life satisfaction was 55.63 (SD = 10.84). The mean score for the pleasure axis of the Affective Well-being Questionnaire was 2.78 (SD = .84), 4.14 (SD = .80) for anxiety- contentment, and 4.41 (SD = .95) for depression-enthusiasm.

Gaming Motivations

A mean score was calculated for the importance of each of the gaming motivations. Table 4 presents the mean scores for gamers' ratings of the importance of each of the gaming motivations. Playing games for enjoyment was the most important (M = 4.62, SD = .62), followed by challenge (M= 3.94, SD= 1.00), and reduction of boredom (M= 3.83, SD= 1.11).

Table 4: Descriptive analysis of ratings of importance of gaming motivations

Motivation	Mean	SD	Min	Max

Stress reduction	3.44	1.27	1.00	5.00
Enjoyment	4.62	.62	1.00	5.00
Hand-eye coordination	2.86	1.30	1.00	5.00
Fantasy	3.07	1.40	1.00	5.00
Making friends	2.34	1.23	1.00	5.00
Challenge	3.94	1.00	1.00	5.00
Intellectually stimulating	3.28	1.14	1.00	5.00
Socialise with friends	3.22	1.36	1.00	5.00
Reducing boredom	3.83	1.11	1.00	5.00
Friends do it	2.52	1.34	1.00	5.00
Exploration	3.35	1.37	1.00	5.00

4.3.2. Thematic Analysis of Gaming Motivations

Motivational Factors

Responses were collated from the open-ended section of the questionnaire asking about gaming motivations and experiences. Eight motivational factors were identified and are discussed below in further detail. These included; social, fantasy, escapism, stress relief, alleviation of boredom, exploration, sense of accomplishment and challenge.

Social. Fulfilment of social needs and to engage with others were key reasons for playing videogames. Both online and offline social interactions during gaming appeared to be important for gamers. Social interactions in gaming were shown to be a way of facilitating teamwork in achieving a common goal, and for creating competition against others. It was also found that gamers are socially motivated, not just for teamwork and competitive interactions with others, but purely for the enjoyment of communicating with others during a common activity. This suggests gaming is an effective platform for social networking with friends. Playing games in offline contexts was discussed as an effective way of creating a positive social atmosphere, and playing the *Nintendo Wii* was specifically mentioned as facilitating social connectedness between family members. The responses indicated that the social opportunities that gaming provides make the activity enjoyable.

Social interaction in gaming is likely to depend largely on the type of game being played. For example, games such as *Mario Karts* (Nintendo Wii) are primarily social in nature compared to the *Half Life* series, which are based more strongly around strategy and engagement with the game narrative. This suggests that the strength of social motivations for gaming is likely to vary considerably depending on the particular game of choice in any specific gaming context.

Illustrative Quotations

In the social aspect we can get together and play games like *Guitar Hero*, or...*Halo 3* with several consoles and have a blast, online or together either way it gives us all something enjoyable to do.

I enjoy working with my friends in situations that are otherwise impossible to do in real life. I like when we overcome challenges and use teamwork to achieve goals

It's enjoyable when playing against others and competing against them.......

When I play, I have a good time chatting with others during the match. We have some fun conversations that usually are not related to the gameplay.

When playing on the *Nintendo Wii*, I mainly play team games with my family, and it acts as a way of bringing the family together, which makes us all happier.

Games are primarily for me now a social tool. *Pro Evolution Soccer* is by far one of the most universal games in the UK, and it provokes a social atmosphere in that most people will indulge in a game of it in a social group

Fantasy. Playing videogames as a way of being immersed in a fantasy world, distinct from real-life was also identified as an important gaming motivation. The virtual environment provides an opportunity for experimentation in a safe setting (e.g., car racing through urban streets) which would normally be risky and have potentially negative real-life consequences. Opportunities for acting out scenes and role-playing as a unique character also emerged as a key factor behind game playing. This was related to perceptions of being in control during gameplay and was discussed in relation to distinctions with control over real-world situations. This suggests a strong intrinsic motivation for playing, as a means to simply capture one's imagination and experience things which are not necessarily possible in the real world.

Illustrative Quotations

I enjoy playing games that involve me killing another player as it makes me feel in control. I can distinguish however, the difference between a game and the real world, and hence would never take my 'killing' attitude outside of my game-playing.

I enjoy indulging my imagination and doing things that I can't do in reality. I can easily imagine myself as a Jedi Knight wielding a Lightsaber and have the wonder of a child even though I am in my mid twenties, married, and attending my final years.......

Living life through another person's shoes is an altogether liberating experience. I mean, you can really take liberties with videogame characters that you can't with real-life ones.

I just feel like I can do anything I want because it's not going to hurt anyone in real life.

Escapism. Engaging in virtual worlds was viewed as a means of escapism from everyday life, and could act as a distraction from real-life stresses. This could be achieved through the processes involved in gaming which keep gamers focused on the task at hand, rather than real-world stresses or troubles. The escapism from reality could, in turn, allow gamers to become immersed and experience excitement in a fantasy world.

Illustrative Quotations

While playing you can forget about any troubles, and 'lose' yourself in the gaming world.

It is just an escape, a temporary moment of peace from the stresses of everyday life.

I like to get away from the realities of life and immerse myself in fantastical environments simply to experience the excitement and adventure that they have to offer.

The sense of immersion in a well produced videogame can provide a welcome escape from the trappings of the daily grind.

Boredom reduction. Playing videogames could also be an effective way of alleviating boredom and passing time. It was also seen as an alternative to outdoor activities in

instances of poorer weather conditions. The responses indicated that more important activities took priority over gaming, but it was available if gamers had nothing more constructive to do to take up their time. This motivation largely reflects extrinsic motivations for gaming,

Illustrative Quotations

Helps to alleviate boredom and become more interactive so it gets you up and moving about.

I often play video games just for something to do, as a way to alleviate boredom.

Its just fun and it kills time when bored.

My main reason for playing games is for something to do. If I don't have something constructive to take up my time, I'll often play games until something better comes along.

Most the time playing video games is just to pass the time or in winter have something to do indoors.

Stress-relief. The potential benefits of gaming as a form of relieving stress from everyday life were also apparent as a motivation in the analysis. Some gamers find gaming to be an effective means of discharging negative affect in a socially acceptable way. This motivation is conceptually distinct from gaming for escapism which implies a distinction from real-life, whereas the alleviation of negative affect reflects a more regulatory use of the activity. This motivation was also found to be associated with improvements following gameplay (e.g., less frustrated/stressed). However, such an outcome is also likely to depend on the type of game played, as reflected by game genre, specific game content and the potential social experiences provided.

Illustrative Quotations

Often playing games can become a cathartic tool to relieve stress levels by taking aggression out in a more socially acceptable format. Also it can often be a way of switching off and 'plugging in' to a different environment which can often be entertaining.

> I enjoy playing games partially because they can relieve stress and/or frustration. While it does not work as well as playing sports (soccer in my case), playing games can still help me unwind after an intense study session or something similar….

> I have a stressful job and playing games is stress release for me

> I find that after having a stressful day playing some games can reduce stress during playing. After having played, I feel less stressed in total.

Exploration. Playing videogames as a means of discovering and exploring new and often exciting worlds was also a common motivation cited by gamers. Game environments provide a setting in which there is substantial opportunity for gamers to explore and navigate the virtual world. A key characteristic of the exploration motivation is to simply admire the scenic or aesthetic features of the virtual world. In a number of cases, the scenic properties of the game world depict real world environments, so exploring these in gaming can be an effective way of discovering parts of the world which otherwise may not be possible. The ability of videogames to capture imagination, facilitate perceived freedom and curiosity is appealing to gamers, and can be both enjoyable and rewarding.

Illustrative Quotations

> The exploration of new environments can be incredible rewarding especially in games such as *Tomb Raider* where the environments are based or take place in real world locations.

> I suffer from social anxiety and agoraphobia, yet find I particularly enjoy games with open, unrestricted areas and plenty of scope for exploration.

> …I enjoy idealistic and beautiful environments. We don't see enough of this kind of scenery; the heavy focus on war-torn greys and browns is too widespread in my view.

Sense of accomplishment. A perceived sense of achievement can be accomplished through gameplay through successful competition in beating others, getting a high score, or accomplishing missions. The motivation to experience achievement through gaming was equated with positive experiences and enjoyment, and maintaining gamers' interest in continuing to play particular games.

Illustrative Quotations

I love learning things and improving myself so the satisfaction of figuring out how to complete a certain level, earn a high score or beat a friend at a competitive game is great...

The enjoyment comes from as sense of achievement which in turn adds to a feeling of contentment...

If victorious a sense of achievement is felt and in loss you seek improvement and look forward to trying the task again.

I enjoy the feeling of achievement you get when you 'beat' a game.

Satisfaction when I find myself with certain skills to achieve certain tasks within the games, not to mention a certain feeling of accomplishment.

Challenge. The challenges associated with gaming (e.g., difficulty level, competition) also emerged as a strong motivational factor. Some gamers also viewed challenges in videogames as useful in preparing them for challenges in the real world. Being able to solve puzzles and feeling challenged by the level of the game were important for motivating gamers to play games, resulting in feelings of enjoyment.

Illustrative Quotations
Love the challenge and don't like a game beating me.

Very important to me is to be able to challenge myself, preferably versus other humans but if possible versus good artificial intelligence.

It is good to play games. These games help you solve the myths, riddles (depending upon the game type) which takes your mind to higher grounds. It makes you capable of getting ready for the challenges coincidentally identical to real life.

The challenge when playing against another player creates an enjoyable and healthy competitive environment in which I thrive from.

I like the challenge. I have been playing games for over 18 years now and the challenge has always been great. I do not like games which are too easy. I enjoy the feeling when I complete a game that has challenged me.

Experiences

Two gaming experiences were identified through the open-response item. These were enjoyment and flow. It was apparent that gamers played purely for the enjoyable and

positive experiences which gaming provided. These will be discussed in further detail below.

Enjoyment The general enjoyment and fun which can be derived through gaming was an experiential factor for a number of gamers. The derived enjoyment and positive experiences which gaming can offer ultimately determines the success of the specific videogame. If a game is not enjoyable, it will not be played. Feelings of enjoyment experienced through gaming were found to be a determinant of future gameplay. Gaming was also described as more enjoyable than other entertainment activities such as watching TV. This enjoyment may arise through the more interactive nature of videogaming compared with other activities, and the associated heightened sense of immersion.

Illustrative Quotations

The most important thing is that I'm having fun obviously….fun and enjoyment in general…

I enjoy playing games because they are enjoyable, if a game becomes boring I turn it off. There's no point playing a computer game if you aren't going to enjoy playing it, it defeats the whole object. When I enjoy a computer game, it makes me happy...

I love to play as it is more fun than watching TV.

If there is a particular type of game that you like to play, its really enjoyable. The more you enjoy the game, the more you play it...

Flow There was also evidence that flow occurred in gaming, and was associated with game features such as storyline. Losing sense of awareness which could lead to transcendence into game characters, feeling "in the zone", and perceiving a sense of presence in the gameworld were mentioned as indicators of flow in gameplay. Experiences of flow in gaming, in turn resulted in enjoyable gaming experiences, which could be derived both from feelings of exhilaration and relaxation. These feelings are likely to be largely game specific.

Illustrative Quotations

I like that 'zone' feeling you can sometimes get, when you lose self awareness and seem to enter a zen like state where everything in the new universe just makes sense. The oddest example of this is Mr Driller, which is just awesome when it clicks.

When I game, it feels as though I'm *in* the world and that I'm a part of it myself. It helps take my mind away from the present and helps me relieve myself whenever I feel as though I need some comfort and fun.

Whenever I play a game, I usually feel like I'm being sucked in to a great story which is one of my favourite aspects of video games.

I feel that in certain games you can get very involved with the character and have adrenalin rushes and feel things as if it was yourself.

When a game makes me feel aroused I don't realise it until it is pointed out to me but my breathing quickens, I block out other people that are in the room and I tend to shout out at the TV. Most games I play make me aroused because I like to really get into the game...

Video games almost centre me sometimes, they don't take away from my reality and concepts of life but they are a way of letting my brain wander and relax....

Good videogames take me away to another world, and actually make me feel that by enjoying the learning curve of a certain set of skills I become more... whole?

4.3.3. Principal Components Analysis

Principal components analysis was undertaken on the gaming motivations and flow items of the quantitative items of the questionnaire. This was to identify factors for inclusion in further multiple regression analyses.

Gaming Motivations

The gaming motivation items were subjected to principal components analysis (PCA), through Varimax rotation, using SPSS. Prior to performing PCA, the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients above .3. The Kaiser-Meyer-Oklin value was .80 and the Bartlett's test of Schericity reached statistical significance ($p < .001$), supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of three components with eigenvalues exceeding 1, explaining 33.38%, 11.20% and 10.30% of the variance

respectively. Using Catell's scree test, it was decided to retain the three components for further investigation. To aid the interpretation of these three components, Varimax rotation was performed (see Table 5 below). The rotated solution revealed a number of strong loading onto the three components. The solution explained a total of 54.88% of the variance, with Component 1 contributing 22.14%, component 2 contributing 16.92%, and component 3 contributing 15.83%. The three components of "immersion", "achievement" and "social" were used for subsequent analyses.

A number of items were removed, based on the fact that they cross-loaded on more than one component. These items were: "making new friends", "intellectually stimulating" and "reduces boredom". The criteria for the removal of these items was based on two premises. Firstly, that these items loaded onto their primary component at .30 or greater. Secondly, these items did not having any loadings on any other componenets greater than half their primary loading (Saucier, 1994a; 1994b).

Table 5: Varimax Rotation of Three Factor Solution for Gaming Motivation Items

Item	*Component 1* *(Immersion)*	*Component 2* *(Achievement/fun)*	*Component 3* *(Social)*
Helps hand-eye coordination		**.77**	
Fantasy	**.67**		
Making new friends	.48		**.57**
Intellectually stimulating	.50	**.56**	
Exploration	**.56**		.33
Reduces stress	**.51**		
Enjoyable		**.86**	
Challenge	.34	**.62**	
Reduces boredom	**.54**		.40
Friends do it			**.83**
To socialise with friends			**.71**

Flow

The flow items were subjected to principal components analysis (PCA), using Varimax rotation, on SPSS. Prior to performing PCA, the suitability of the data for

91

factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients above .3. The Kaiser-Meyer-Oklin value was .80 and the Bartlett's test of Shericity reached statistical significance ($p < .001$), supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of two components with eigenvalues exceeding 1, explaining 38.28% and 16.16% of the variance respectively. Using Catell's scree test, it was decided to retain the two components for further investigation. To aid the interpretation of these two components, Varimax rotation was performed (see Table 6 below). The rotated solution revealed a number of strong loading onto the two components, and all variables loaded substantially on only one component. The solution explained a total of 54.44% of the variance, with Component 1 contributing 32.27% and component 2 contributing 22.17%.

Table 6: Varimax Rotation of Two Factor Solution for Flow Items

Item	Component 1	Component 2
Intense involvement	**.77**	
Enjoyment	**.70**	-.41
Balance between skill and challenge	**.68**	
Rewards from play	**.68**	
Deep concentration	**.63**	
Clear goals and feedback	**.60**	-.38
Transcendence of self	**.46**	.39
Lack of self-consciousness	.45	**.68**
Distorted sense of time	.51	**.64**

Reliability analysis was conducted on the nine flow items and revealed a Cronbach's alpha value of .77. The reliability did not reduce below significance with the removal of any of the flow items, therefore all items were retained for further analysis. Because all items loaded substantially onto component 1, only one factor was used as a flow factor for subsequent analysis.

4.3.4. Multiple Regressions
Zero-order correlations

Table 7 presents the zero-order correlations, to explore the relationships between the predictor variables (social, achievement and immersion motivational factors and flow), and the criterion variables (flow, pleasure, anxiety-contentment, depression-enthusiasm and total life satisfaction)[4]. The correlation coefficients between each of the predictor variables were lower than .70, indicating little multicollinearity, and suggested inclusion of these variables in the regression model (Tabachnick & Fidell, 1996).

Table 7: Zero-order correlations of the predictor and criterion variables

	2	3	4	5	6	7	8
1. Social	.47**	.38**	.28**	.06	.21**	.18**	.14*
2. Immersion		.55**	.51**	.09	.24**	.17**	.05
3. Achievement			.38**	-.12*	.26**	.23**	.17**
4. Flow				.08	.22**	.24**	.01
5. Pleasure					.04	.05	.44**
6. Anxiety-contentment						.52**	.12*
7. Depression-enthusiasm							.03
8. Total life satisfaction							

$** p < .01 \qquad * p < .05$

Gaming motivation factors and flow

The motivation items were divided into the three categories, previously established by Yee (2007). These were social, achievement and immersion-orientated motivations. A standard multiple regression was conducted for gaming motivation factors on flow for all participants (see Table 7 below). Tables 8 presents the standardised beta values, coefficients, standard errors and significance level for the predictors of flow. Analysis revealed that achievement (β= .15, t = 2.19, p < .05) and immersion-orientated motivations (β = .33, t = 4.71, p < .001) were significant predictors of flow in gaming. Social-orientated motivational factors did not significantly predict flow

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[4] Note: Flow is treated both as a dependant variable in the first multiple regression (Table 7), and as an independent variable in the subsequent regressions (Tables 8-11).

(β= .03, t = .09, p = .095). The adjusted R^2 value indicated that 22% of the variance in flow could be accounted for by the motivational factors.

Table 8: Regression of motivation factors on experiences of flow in gaming

Predictors	B	SE B	β	P
Social	.05	.03	.09	.095
Immersion	.24	.05	.33	<.001***
Achievement	.14	.06	.15	.029*

Note: R^2 = .23   Adjusted R^2= .22   *** $p < .001$ ** $p < .01$ *$p < .05$

Gaming motivations, flow and psychological well-being

Hierarchical multiple regressions were conducted on the gaming motivation factors and flow to predict the dimensions of psychological well-being. Tables 9-12 present the standardised beta values, coefficients, standard errors and significance level for the predictors on the different dimensions of psychological well-being (Total Life Satisfaction, and the three sub-scales of the Affective Well-being Questionnaire). The adjusted R^2 values indicated that less than 10% of the variance in each of the dimensions of psychological well-being could be accounted for by the motivational factors and flow.

Table 9: Regression of gaming motivation factors and flow on Total Life Satisfaction

Predictors	B	SE B	B	P
Step 1				
Social	1.33	.57	.14	.020*
Immersion	.14	.98	.01	.890
Achievement	2.05	1.21	.13	.091
Step 2				
Social	1.41	.57	.15	.014*
Immersion	.55	1.01	.04	.589
Achievement	2.29	1.22	.15	.061
Flow	-1.71	1.09	-.10	.120

Note: Step 2: R^2 = .06,   Adjusted R^2= .04   *** $p < .001$ ** $p < .01$ *$p < .05$

Table 9 shows that for the overall model, social-oriented motivations ($\beta = .15$, t = 2.48, $p < .05$) were significantly predictive of total life satisfaction.

Table 10: Regression of gaming motivation factors and flow on Pleasure sub-scale

Predictors	B	SE B	B	P
Step 1				
Social	.07	.05	.09	.150
Immersion	.11	.08	.11	.147
Achievement	-.28	.10	-.23	.004**
Step 2				
Social	.06	.05	.07	.215
Immersion	.07	.08	.07	.388
Achievement	-.30	.10	-.25	.002**
Flow	.18	.09	.13	.037*

Note: Step 2: R^2 = .04   Adjusted R^2= .03   *** $p < .001$ ** $p < .01$ * $p < .05$

Table 10 shows that in the overall model, achievement-orientated motivations (β = -.30, t = -3.15, $p < .01$) and flow (β = .13, t = 2.10, $p < .05$) significantly predicted pleasure. The negative beta value for achievement-orientated motivations suggests that greater perceived importance of challenge as a motivation for gaming was associated with perceptions of lower happiness, satisfaction and enjoyment in daily life.

Table 11: Regression of gaming motivation factors and flow on Anxiety-contentment sub-scale

Predictors	B	SE B	B	P
Step 1				
Social	.07	.03	.13	.030*
Immersion	.07	.05	.10	.17
Achievement	.12	.06	.14	.076
Step 2				
Social	.06	.03	.12	.046*
Immersion	.05	.05	.07	.397
Achievement	.10	.07	.12	.123
Flow	.11	.06	.11	.071

Note: Step 2: R^2 = .10   Adjusted R^2= .08   *** $p < .001$ ** $p < .01$ * $p < .05$

The overall model, presented in Table 11 shows that social-orientated motivations (β = .12, t = 2.00, $p < .05$) were significantly predictive of greater contentment.

Table 12: Regression of gaming motivation factors and flow on Depression-enthusiasm sub-scale

Predictors	B	SE B	β	P
Step 1				
Social	.04	.03	.07	.226
Immersion	.03	.05	.05	.505
Achievement	.12	.06	.15	.053
Step 2				
Social	03	.03	.06	.342
Immersion	-.01	.05	-.01	.933
Achievement	.10	.06	.12	.111
Flow	.15	.05	.18	.005**

Note: Step 2: $R^2 = .07$ Adjusted $R^2 = .06$ *** $p < .001$ ** $p < .01$ *$p < .05$

Table 12 shows that for the overall model, flow in gaming ($\beta = .17$, t = 2.83, $p < .01$) was significantly predictive of enthusiasm.

4.4. Discussion

The aim of Study 1 was to examine motivations and gaming experiences using a mixed-methods approach. The quantitative components were used to examine the influence of immersion, social and achievement-orientated motivational factors on flow in gaming. It also aimed to examine the influence of gaming motivations and flow experiences in gaming on dimensions of psychological well-being. To develop previous research, the qualitative component of the current study aimed to provide a more detailed examination of key gaming motivations and experiences.

The open-ended responses revealed a number of motivational factors including playing videogames for fantasy, escapism, stress-relief, boredom reduction, socialisation, challenge, sense of achievement and exploration. Some distinctions were identified between some of the motivational factors which emerged from the open-ended response items. Although the factors of fantasy and exploration are both immersion-orientated in nature, they were conceptualised as distinct from one another. Exploration was characterised by the fact that gamers play for the exploration of the scenic properties of the game world, whereas fantasy relates to the appeal that gamers can perform acts which cannot necessarily be carried out in the real world. Distinctions were also drawn between playing games for escapism and stress-relief.

Escapism was defined as playing games simply as a distraction from the real world, including worries and everyday stresses. Stress-relief was characterised as the process which gaming provides to discharge negative feelings.

These motivational factors were relatively consistent with Yee's (2006) five factor model of gaming motivations, since playing games for immersion, achievement, socialisation and escapism emerged as themes. There was little evidence, however, of the *manipulation* theme. Furthermore, the current study identified challenge, escapism, alleviation of boredom, stress-relief, fantasy and exploration as motivations for gaming. The majority of these factors were identified as subcomponents rather than main factors in Yee's (2006) analysis. This distinction between main factors and subcomponents between studies could be a result of sampling differences as Yee's (2006) research was based on MMORPG players, whereas the current study incorporated a wider sample of gamers who played most frequently in solo gaming contexts rather than online gaming contexts. The distinctions between studies suggests there to be motivational differences between gamers who play online compared to offline. It would be interesting for future research to compare the motivations between samples of online and offline gamers, since to date, no research has examined these distinctions.

The qualitative analysis found that social factors were key motivations for many gamers. Further, the social experiences derived through competitive or cooperative gameplay, and online "chat" features for general social networking could, in turn, facilitate greater game enjoyment. Despite this, the sample indicated that the most frequent gaming context was playing solo. This distinction could be explained by the fact that, although gamers enjoy playing socially with friends, it is not always possible to do so. It would have been useful to measure preferences for play in the different gaming contexts examined to provide evidence of the relative enjoyment derived from playing solo and with others. The influence of social motivations on engagement in gaming is consistent with findings from leisure research showing how social considerations facilitate leisure participation and involvement (Kyle & Chick, 2002; Mannell & Kleiber, 1997). This has implications for the way gaming is conceptualised, and challenges the common stereotype of gaming as a socially isolated activity. The development of social games, multiplayer options and online

gaming platforms facilitates gamers' opportunities to engage in social interactions and gameplay with others. Recent research has found the positive influence of social gaming contexts on dimensions of psychological well-being (Kaye & Bryce, under review), suggesting that playing games with others has wider social and psychological implications. The current findings support this since social-orientated motivations predicted contentment and life satisfaction.

The influence of social gaming contexts and the range of social experiences facilitated by gaming, however, requires further empirical study, particularly given the increasing popularity of social gaming for a broadening range of individuals. It would be interesting, for example, to examine the social experiences derived through the use of different games and game consoles (e.g. *Nintendo Wii* compared to *Microsoft Xbox 360*). As the *Nintendo Wii* is primarily an offline social gaming experience for "real life" social interactions, and the *Xbox 360* fosters both offline and online social experiences (with real and virtual friends), the social experiences they facilitate are likely to be distinct. The fact that *Nintendo's* ongoing quest, particularly in developing the *Wii*, is to "revolutionise videogaming and create family-friendly social gaming experiences which anyone can enjoy" (Foster, 2010), suggests that playing on the *Wii* provides highly social experiences, which can be distinct from those of other consoles. Further research should examine the extent to which the different social affordances of consoles are associated with gaming experiences and outcomes. An exploration of the differences between gaming experiences for online and offline contexts, and for solo and multiplayer gaming is also warranted, as this has not been addressed empirically to date. The subsequent studies in this volume address these issues to a greater extent.

The qualitative analysis also identified experiential factors (i.e., enjoyment and flow), which suggests that gamers play for the associated positive experiences the activity provides. This is consistent with previous studies (Choi & Kim, 2004, Hsu & Lu, 2004, Koo, 2009), and offers insight into the associations between gaming motivations and experiences, particularly in motivating future engagement with specific games. It would be beneficial for future research to examine the relationships between gaming motivations and experiences in greater detail, since this has implications for the game design industry in producing enjoyable games which will

motivate future gameplay. Furthermore, it would be useful to examine the specific characteristics of videogames which facilitate positive gaming experiences (e.g., social interactions, game mechanics). This would provide a more detailed examination of gamers' experiences and their ability to facilitate positive outcomes of gaming. The subsequent studies in this volume examine such features and examine their influence on gaming experiences.

The quantitative analysis indicated that achievement and immersion motivational factors were positively predictive of experiences of flow in gaming. This suggests that playing videogames for distraction and the challenges it provides are important determinants of positive gaming experiences. This is supported by evidence from the thematic analysis of the relationship between motivations and positive experiential aspects of gaming. To date, no previous research has examined these links, and so this study offers new insight into the core components which constitute the overall gaming experience. Greater exploration of the varied motivations individual gamers have for specific types of games, and how these variations are linked to experiences of game enjoyment is required. Although some researchers have focused on motivations for specific types of games (e.g., role-playing games) (Tychsen, Hitchens & Brolund, 2008), there is little evidence of motivations for playing other game genres. That is, games such as *Guitar Hero* may be more socially-motivated than games such as *Tomb Raider* which may be more exploratory-motivated. There are also likely to be motivational differences within individuals on the games they play. That is, variations in affective states may determine motivation to play different types of games. For example, if a person is feeling competitive, they may be more likely to play a racing or sports game with higher levels of competition and seek to play against other gamers rather than alone. Conversely, if gamers feel a need to relax, they may prefer an alternative type of game or situation. No research to date has examined this, highlighting the need for further research to assess the influence of person and external factors which may influence motivation to play different games. To address these issues in greater detail, Study 3 of the current research examines specific influences on gameplay engagement.

Social motivational variables did not significantly predict flow in gaming. This can be explained by the conceptualisation of flow as a highly personal experience,

characterised by intrinsic interest in the activity (Csikszentmihalyi, 1990). Although some social motivations are intrinsic (e.g., feelings of social belonging), others are extrinsic (e.g., playing to make new friends). This mixture of extrinsic and intrinsic motivations could explain the lack of predictive value of social factors for the experience of flow in gaming. This has theoretical and empirical implications for the conceptualisation of social motivations for engaging in leisure activities with the wider leisure literature. This raises the issue of how social motivation should be conceptualised within the intrinsic/extrinsic dichotomy, or whether it constitutes a separate motivational category. It can be argued that because a sense of social belonging underlies social gaming motivations, they have an intrinsic element. This issue requires further theoretical and empirical consideration, given the importance of social factors in gaming (e.g., social interaction, social play with friends) as motivational and experiential factors which also influence the potentially positive or negative experiences of the activity (Kaye & Bryce, under review).

Achievement motivations negatively predicted the pleasure axis of affective well-being. This suggests that there is generally a negative relationship between playing videogames for the challenges and feelings of accomplishment they can provide, and perceptions of well-being (i.e., satisfaction, happiness and enjoyment in life). This could suggest that those individuals who are generally less satisfied in life, may be motivated to play games as a means of experiencing feelings of self-determination and achievement in alternative ways. In this way, gaming fulfils a role in an equivalent way to other leisure activities, in providing an opportunity for individuals to strive towards goals, whilst experiencing a positive, intrinsically rewarding activity (Iso-Ahola, 1980). This supports the contention of considering gaming within the wider context of leisure, to provide a broader framework for examining the the influence of leisure motivations on thw wider outcomes of gaming,

Flow in gaming was a positive predictor of greater enthusiasm and pleasure, which provides some support for previous research showing the links between flow and psychological well-being. Flow, however, was not a predictor of contentment or total life satisfaction. This can be attributed to the fact that gaming constitutes only a percentage of a gamer's life, and that numerous other variables, (e.g., work and relationships) play a role in influencing perceptions of well-being. This highlights the

need to consider the results of the current study within the wider contexts of daily life when examining the influence and outcomes of gaming motivations and experiences. It would be useful for future research to focus more on immediate affective responses to gameplay. This could be undertaken using qualitative methods (e.g., focus groups) which ask gamers to describe their feelings after gameplay, or quantitatively by examining changes from pre and post affect measures, and how these correlate with flow during gameplay. This would provide stronger evidence of the relations between positive flow experiences in gameplay and associated psychological consequences. Study 2 of the current programme provides an empirical examination of this issue.

Some limitations of this study include the small percentage of accountability of the variables in some of the regression analyses, and the low reliability of the affective well-being sub-scales. In response to the latter limitation, the findings from the principal components analysis suggest each of the items of the anxiety-contentment and depression-enthusiasm sub-scales to be suitably loaded onto their relevant components. This raises the question of the reason for the extremmly low alpha values for the sub-scales of the questionnaire. It is conceivable that this arose as a result of the questionnaire being completed online, in contrast to it being a traditional paper-based questionnaire. The way in which it was completed, in addition to the potential sample differences, could account for this noteworthy distinction in values between studies (e.g., Bryce & Haworth, 2003). Therefore, these limitations should be acknowledged when interpreting the strength of the findings. The qualitative aspects of the study, however, provide support for some of the quantitative results, so the results should be considered together, to help overcome these potential limitations.

Study 1 has examined the links between gaming motivations and experiences, addressing a gap in the existing literature. Rather than targeting specific types of gamer (e.g., MMORPG players) as is common in previous research, this study examined a broader range of gamers. This greater scope provides a more comprehensive account of the range of gaming motivations and experiences for a variety of gamers, and provides further understanding of the potential consequences of playing videogames.

This study has also highlighted the value of empirical research examining gaming within a leisure context to provide greater scope for examining the associated motivational and experiential factors. Based on the substantial evidence demonstrating the benefits of engagement with leisure activities for health and well-being (e.g., Hull, 1990; Iso-Ahola, 1997; Iso-Ahola & Mannell, 2004), it seems reasonable to assume that gaming can provide gamers with equivalent positive experiential outcomes (though not physically, with the exception of active gaming consoles). The range of these outcomes can only be examined in an ecologically valid way by examining gaming within a leisure context. Focusing too closely on the negative effects of engagement with violent game content, without considering the motivational and experiential value of the activity, cannot provide researchers with an adequate understanding of the holistic experiences and meanings derived through gaming.

CHAPTER 5: STUDY 2

5.1. Introduction

The previous chapter examined the influence of gaming motivations and flow on psychological well-being. The finding that flow did not significantly predict all dimensions of well-being informed the development of the rationale for Study 2, which examined the experience of flow in a specific gaming session, and assessed its associations with mood following gameplay. It examined the immediate affective and psychological consequences of flow in gaming, and re-examined associations between flow and psychological well-being. It also assessed the ability of particular videogames to facilitate experiences of flow within a controlled context, whilst also exploring the influence of levels of violent content on gaming experiences and affective outcomes.

Little empirical evidence is available on flow in gaming, particularly using experimental designs. This makes it difficult to identify the extent to which flow experiences are related to the potential positive (or negative) outcomes of gaming. Although some studies have demonstrated that flow in gaming is associated with positive affect and enjoyment (Klimmt, Hartmann & Frey, 2007; Smith, 2007), no research to date has examined the relationship between flow experiences in gameplay and changes in mood from before to after gameplay. Furthermore, no experiments have utilised a pre and post test measure of mood in relation to gameplay. Study 2 aimed to identify potential changes in both positive and negative affect pre and post gameplay, and to examine the influence of flow on these changes. It also aimed to extend the flow model to the context of gaming, by examining the influence of flow in gameplay on changes in activation and deactivation, as previous studies have shown associations between flow and arousal (Ellis et al., 1994).

Although a plethora of experimental studies have compared violent and non-violent game conditions in relation to aggression-related outcomes, violent game content has not been examined as a factor influencing or facilitating positive gaming experiences, particularly in samples of regular gamers. It also remains unclear how aggressive personality is related to enjoyment of violent content. Research has shown that individuals high in trait aggression prefer viewing violent films and experience higher

hostility following violent media exposure than individuals low in trait aggression (Bushman, 1995). Specifically for gaming, research by Przbylski, Ryan and Rigby (2009) provides initial evidence that individuals high in trait aggression prefer violent games, and that those low in aggression prefer non-violent games. Research also suggests that individuals high in trait aggression exhibit more aggressive forms of gameplay (Peng, Liu & Mou, 2008), although other studies have failed to replicate this finding (Paradise, 2008). These studies, however, do not focus on representative samples of gamers, resulting in limited generalisability of their findings. In light of this, Study 2 aimed to examine the differences between games of differing levels of violent content on flow experiences and post-gameplay mood. As mentioned previously in Chapter 3, rather than using violent and non-violent game conditions, highly and mildly violent game conditions were used as the two games selected for use in the main study were based on the pilot study findings, resulting in the best matched games having the same certification. Using mildly and highly violent conditions was deemed more suitable than violent and non-violent, based on the nature of the games' content. That is, both included violent content, but to varying degrees. In addition, this was utilised as a way of provided better control of all the aspects between the two games. The current study also aimed to explore the associations between trait aggression, flow in gameplay and affective outcomes.

The objectives of the study were to:

1. Examine whether the experience of flow during gameplay was associated with pre-post changes in (positive and negative) mood.
2. Examine the extent to which level of violent content influences flow in gameplay and mood outcomes, and whether this is influenced by aggressive personality.
3. Examine the relationship between the experience of flow in gameplay and psychological well-being.

5.2. Pilot Study

Videogames are extremely complex forms of entertainment which vary on a large range of dimensions (e.g., storyline, action, violence and challenge). This makes it difficult to identify which aspects are particularly influential on gaming experiences,

and to control differences between specific games for experimental research. A substantial proportion of existing experimental videogame research does not provide adequate control of game characteristics in the choice of games used. Given that research has shown that action-orientated games lead to greater levels of physiological arousal than non-action-orientated games (Arriaga et al., 2006), and that game sound is associated with more positive gaming experiences than no game sound (Nacke, Grimshaw & Lindley, 2010), it is important to consider these issues when choosing games for use in experimental research. Different game genres are likely to present different types of objectives and achievement schemes, making it difficult to draw reasonable comparisons between the experiences that are associated with playing different games. The typical findings of higher aggression-related variables following play in violent conditions compared with non-violent conditions could, therefore, be a product of confounding game differences, rather than an effect of exposure to violent content. If research aims to compare experiences and effects of violent videogames, it is important to control these potential confounds. This was addressed in the current study by conducting a pilot study which asked gamers to rate recently played videogames on a number of game characteristics.

5.2.1. Method

The sample consisted of 101 gamers (82 male, 15 female, 4 did not specify) who were recruited by advertising the study through online forums and discussion boards. Participants completed an online questionnaire by rating videogames they had recently played. Participants were asked to indicate the names of the games they were rating. The ratings were used to select two games based on a match between as many of the game characteristics as possible (e.g., level of action, skill requirement, challenge) for use in the main study. This would ensure that the only difference between game conditions was the level of violent content and promotion of aggression. The game characteristics measured were enjoyment, violence, engagement, activity, boredom, rewards, realism, competitiveness, entertainment value, challenge, frustration, action, skill, excitement and identification with game characters. Ratings for items of flow (e.g., "the challenge of the game and my skills were at an equally high level") and aggression (e.g. "this game encourages aggressive attitudes") were also included. Each item was rated on a scale of 1 to 7 (1 = strongly disagree, 7 = strongly agree), and participants were asked to indicate the extent to

which they agreed that their chosen game had a high level of each aspect (e.g., "this game has a high level of competitiveness"). Mean scores for each item were calculatedand used for subsequent analysis as described in the following sections. Please see Appendix 3 for a copy of the questionnaire.

5.2.2. Results

Descriptive statistics

Frequency analysis was conducted on the demographic information and gaming habits of the sample (see Table 13 below). Analysis revealed that the majority of the sample was male (84.50%), aged between 18-25 years (29.10%), played videogames regularly (46.10%), for 11-15 hours per week (21.30%).

Table 13: Frequency analysis of the demographics and gaming habits of the sample.

Demographic		*N*	*Percentage*
Gender	Male	82	81.50%
	Female	15	15.50%
Age	< 18 years	18	12.80%
	18-25 years	41	29.10%
	26-40 years	37	26.20%
	41-50 years	1	0.70%
How often	Regularly	65	46.10%
	Most of the time	25	17.70%
	Occasionally	6	4.30%
Hours per week	< 1 hour	1	0.70%
	1-5 hours	11	7.80%
	6-10 hours	20	14.20%
	11-15 hours	30	21.30%
	16-20 hours	15	10.60%
	21-25 hours	8	5.70%
	26-30 hours	4	2.80%

				30+ hours	7	5.00%				

Descriptive analysis of game characteristics

The frequency of ratings for all rated games was generated to compile a short-list of eleven games: *Call of Duty 4, Gears of War 2, Grand Theft Auto 4, FIFA 09, Fable 2, Bioshock, Fallout 3, Half-Life 2, Halo 3, Burnout Paradise* and *Mario Karts.*

Descriptive analysis was conducted on the data to provide a score for each of the game characteristics for each game (see Table 14 below). The highest mean violence score was for *Half Life 2* (M = 6.33, SD = 1.21) and the lowest for *Mario Karts* (M = 3.00, SD = 2.00). The highest mean flow score was for *Mario Karts* (M = 6.42, SD = .80) and the lowest was *FIFA 09* (M = 4.32, SD = 1.80). Mean aggression scores showed that the highest rated game was *Bioshock* (M = 6.20, SD = .72) and the lowest was *FIFA 09* (M = 2.70, SD = 1.87).

Table 14: Mean scores of the game characteristics for short-listed videogames

Game feature	Call of Duty 4	Gears of War 2	Grand Theft Auto 4	Fifa 09	Fable 2	Bioshock	Fallout 3	Half Life 2	Halo 3	Burnout Paradise	Mario Karts
Enjoyment	4.56	2.70	4.50	4.43	4.63	5.33	3.85	2.57	4.33	6.00	3.00
Violence	4.33	3.90	4.30	4.43	4.38	4.00	3.77	6.33	3.67	4.67	3.00
Engagement	3.83	3.10	4.50	4.57	4.81	4.67	3.92	4.00	4.83	5.00	3.00
Activity	5.05	6.00	5.10	5.29	4.75	4.00	5.31	4.86	6.00	6.33	7.00
Boredom	5.94	6.30	5.20	6.29	4.75	4.33	4.69	5.57	5.83	6.00	6.33
Rewards	6.28	6.90	6.50	4.29	6.63	6.00	6.00	6.00	6.33	6.33	5.33
Realism	5.06	5.70	4.90	6.14	4.88	5.67	5.54	5.86	5.17	6.00	6.00
Competitiveness	5.28	4.50	4.90	5.71	5.13	5.67	4.92	6.14	5.00	2.67	6.00
Entertainment Value	5.56	6.40	3.90	5.71	5.19	4.67	5.46	6.57	6.17	3.00	5.67
Challenge	5.17	4.20	5.40	4.43	4.56	5.00	4.62	4.29	4.17	6.33	2.33
Frustration	5.83	5.70	5.70	3.14	4.13	3.67	5.23	2.57	6.50	4.67	2.00
Action	4.28	5.10	4.10	5.86	5.13	6.00	4.77	5.57	5.00	6.00	3.67
Skill	5.89	5.90	5.00	6.00	5.69	6.37	5.23	6.43	5.83	3.33	6.33
Excitement	5.33	5.70	4.90	5.00	5.00	4.00	5.31	3.71	5.33	6.00	6.00
ID with Characters	6.61	6.10	4.40	5.29	5.63	6.00	6.00	6.00	6.17	7.00	6.33
Flow	5.35	5.67	5.10	4.32	5.27	5.67	5.57	5.00	5.00	5.63	6.42
Aggression	3.56	4.66	4.08	2.70	4.55	6.20	4.42	5.31	2.91	3.05	4.20

Ratings for game aspects were compared between *Half Life 2* and *Halo 3* as the game ratings appeared most compatible on the relevant aspects. This was judged by initially

inspecting the means for violence and aggression scores across the short-listed games. Both these scores were statistically different for these games, therefore, they were further examined for similarities (or differences) on the other game aspects. Analysis revealed that there was a significant difference between the two games on ratings of violence (z = -2.12, p < .05), with *Half Life 2* (M = 6.33, SD = 1.21) being rated higher than *Halo 3* (M = 3.67, SD =1.21). There was also a significant difference for mean aggression (z = -2.49, p < .05), with *Half Life 2* (M = 5.31, SD = 2.18) being rated more aggressive than *Halo 3* (M = 2.91, SD = 2.91). None of the other game characteristics were significantly different between the two games [5], with the exception of *frustration* (z = -2.38, p < .05), which was higher in *Halo 3* (M = 6.50, SD = 1.87) than *Half Life 2* (M = 2.57, SD = 1.27). Although this was a relatively substantial difference (MD = 4.63, p < .05), the two games were the most comparable on all the other aspects, in contrast to the comparisons between the other games. Based on the pilot study analyses, *Half Life 2* was used for the highly violent game condition and *Halo 3* for the mildly violent. This decision is also supported by the content descriptions of the games, as *Halo 3* contains "blood and gore, mild language and violence", compared with *Half Life 2* containing "blood and gore, and intense violence".

5.3. Main Study

5.3.1. Design

A mixed design was used in which each participant took part in one of two game conditions (highly or mildly violent game), and pre and post measures of mood were compared within and between conditions. The first part of the study examined the differences between pre and post-test affective measures for the whole sample. The second part assessed the influence of flow, aggressive personality and game condition on the changes in affect between pre and post-test. Correlations were also conducted between flow and dimensions of psychological well-being.

5.3.2. Participants

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[5] Enjoyment (z =-1.42, p =.81), engagement (z =-95, p = .37), activity (z = -.94, p = .45), boredom (z=-.31, p = .84), rewards (z = -.50, p = .73), realism (z = -.98, p = .37), competitiveness (z = -1.21, p = .30),entertainment value (z = -.71, p = .53), challenge (z = -.45, p = .73), action (z = -1.04, p = .37), skill (z = -.82, p = .53), excitement (z = -.36, p = .73), identification with characters (z = -1.18, p = .30).

The sample consisted of 56 gamers (52 male, 4 female). The majority of the sample was aged between 18-25 years (85.7%), and played games at least on a regular basis (96.5%). Participants were selected through means of targeted sampling from Computer Game Development and Game design courses at the University of Central Lancashire.

5.3.3. Materials and Apparatus

Participants played a videogame using an *Xbox 360* console through an LCD HD television. The games used were *Half Life 2* for the highly violent condition and *Halo 3* for the mildly violent condition. Both games used were First Person Shooter (FPS) games. Justification for choosing these games derives both from the pilot study findings and that First Person Shooters are the most popular game genre in the commercial market. *Halo 3* was played from the game onset whereas *Half Life 2* was started at a suitable point within the game, since the onset included insufficient action (i.e., tutorial) to be adequately matched to *Halo 3*. Pre-test measures of trait aggression, psychological well-being, and affect were taken. A background questionnaire on gaming preferences, habits and motivations was also completed. Post-test measures of affect and flow were completed following the gameplay period. Please see Appendix 4 for a full copy of the questionnaire.

Background Questionnaire

The Background Questionnaire included measures of demographic information, gaming habits (how often participants played games, hours per week spent gaming, frequency of play in different gaming contexts), gaming preferences (i.e., consoles and genres), and gaming motivations.

The *Life Satisfaction Questionnaire* (Warr et al., 1979) and *Affective Well-being Questionnaire* (Warr, 1990) were used as described in Study 1. The alpha coefficient for Total Life Satisfaction was calculated as .65. The coefficients for the sub-scales of the Affective Well-being Questionnaire were: .71 for anxiety-contentment, and .81 for depression-enthusiasm.

Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992)

The Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) was used as a pre-test measure of trait aggression. The sub-scales of this questionnaire are measures of physical aggression, verbal aggression, hostility and anger. Participants were asked to rate the extent to which a series of 29 statements were characteristic of themselves on a 7-point scale (1= extremely uncharacteristic of me, 7 = extremely characteristic of me). Items included: "sometimes I fly off the handle for no good reason" and "my friends say that I'm somewhat argumentative". A score for trait aggression was obtained by calculating the total score for all the items. This was used in the subsequent analyses outlined in the following section. Further, total scores for each of the four sub-scales were calculated. Internal consistency of the BPAQ has shown to be acceptable for each of the separate sub-scales. (Physical aggression = .85, Verbal aggression = .72, Hostility = .77, Anger = .83) (Buss & Perry, 1992). Furthermore, test-retest correlations show acceptable levels of reliability (Physical aggression = .80, Verbal aggression = .76, Hostility = .72, Anger = .72 (Buss & Perry, 1992). These data therefore suggest adequate stability over time. Similarly, the current study found an overall alpha coefficient of .89, and all sub-scales to be .79 and above.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).
This scale was used as a pre and post test measure of positive and negative affect. Participants were asked to rate how well the 20 items of feelings and emotions described them at the present time on a 5-point scale (1 = very slightly or not at all, 5 = extremely). Positive items included "enthusiastic" and "alert", and negative items included "hostile" and "nervous". The mean scores for the two sub-scales of positive affect and negative affect were calculated and used in subsequent analyses. Research has revealed the PANAS scale to be reasonably high in internal consistency reliabilities, with Cronbach's coefficient *a* ranging from .86 to .90 for Positive affect and .84 to .87 for Negative affect (Watson et al., 1988). Furthermore, test-retest reliability is acceptable, with the Positive Affect items being .86 and the Negative Affect items being .87 (Watson et al., 1988). The current study found similar reliability, as the alpha coefficients were calculated as .84 for Positive Affect and .79 for Negative Affect.

The Activation-Deactivation Check List (AD ACL, Thayer, 1989)

This is a measure of mood states, primarily concerned with the feelings of activation and deactivation. It includes two dimensions of arousal: energetic arousal (EA) and tense arousal (TA). The EA dimension ranges from Energy to Tiredness, and the TA dimension ranges from Tension to Calmness. EA and TA are consistent, respectively, with dimensions of positive activation (positive affect) and negative activation (negative affect). Participants were asked to indicate the extent to which the mood adjective describe their present mood on a 4-point scale (1 = not at all, 4 = definitely feel like this). Items include "alert", "calm" and "vigorous". The current study used an adjusted version of the original checklist since some of the items had ambiguous terminology (e.g., "clutched-up" and "full-of-pep") and would be misunderstood by the target sample. Additional adjectives were also added to the checklist, these being "excited", "assertive", "happy" and "exhilarated", to supplement the removed items. A total of 20 adjectives were used, 10 measuring activation, and 10 measuring deactivation. Mean scores for the two sub-scales were calculated and were used in subsequent analyses. The reliability and construct validity of the AD ACL is well established (Lochbaum & Lutz, 2005; Thayer, 1989). Lochbaum and Lutz's (2005) research on enjoyment of aerobic exercise found the internal reliabilities for EA and TA as .85 and .69, respectively across the three measurement times, suggesting the measure to be have adequate reliability. Along similar lines, the current study calculated Cronbach's alpha as .75 for activation, and .68 for deactivation.

Flow State Scale-2 (Jackson & Eklund, 2002; Jackson & Marsh, 1996)

The Flow State Scale-2 (Jackson & Eklund, 2002; Jackson & Marsh, 1996) was used as the post-test measure of flow derived through the gameplay experience. Participants were asked to rate the extent to which they agreed with a series of 36 statements of flow on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Items included "I felt in total control of what I was doing"; and "my abilities matched the high challenge of the situation." There were four items for each of the nine flow dimensions. Means scores for each of the nine sub-scales were calculated, and an overall mean score, which formed the basis for subsequent analyses.

Jackson and Marsh (1996) conducted numerous factor analyses to establish the Flow State Scale as a global measure of flow. The criteria used to select the items in the scale included the goodness-of-fit measures for the nine first-order factor model and

LISREL's modification indices (Joreskog & Sorbom, 1989). It was found that the internal consistency estimates for the nine Flow State Scales were reasonable (alpha M = .83). Further research showed the alpha internal consistency estimates of all nine subscales of the scale to range from .79 to .86 (Tenenbaum, Fogarty, & Jackson, 1999) and from .80 to .92 (Jackson & Eklund, 2002). The current study calculated an alpha coefficient of .89 for the scale, suggesting adequate reliability.

5.3.4. Procedure

The study was conducted in a quiet lab room, with the *Xbox 360* linked to a ViewPia® Lab LCD HD Television. Following briefing and consent, participants were issued with a series of questionnaires. Firstly, participants were asked to complete the background questionnaire. Next they were asked to complete the measures of psychological well-being, trait aggression and affect. On completion of these questionnaires, participants were then randomly assigned to one of two conditions (highly violent or mildly violent), in which they were required to play a videogame for a period of 40 minutes. Following gameplay, participants completed post-test measures of affect and flow.

5.4. Results

5.4.1. Descriptive statistics

Descriptive analysis was conducted on the demographic information of the sample (see Table 15 below). This included gender, age, gaming habits, and preferences. The majority of the sample was male (92.90%), aged between 18-25 years (85.70%), who played videogames at least on a regular basis (96.50%). The highest rated game genre was First Person Shooter (M = 4.20, SD = .84), and more than 80% of participants had played on a PC, *Xbox 360*, *Sony Playstation 2* and/or *Nintendo Wii.*

Table 15: Frequency analysis of demographics, gaming habits and preferences of the sample

Demographic		N	% or Mean (SD)
Gender	Male	52	92.90%
	Female	4	7.14%

Age	18-25 years	48	85.70%
	26-40 years	7	12.50%
	41-50 years	1	1.79%
How often	Regularly	38	67.90%
	Most of the time	16	28.60%
	Occasionally	2	3.57%
Hours per week	1-5 hours	5	8.93%
	6-10 hours	10	17.90%
	11-15 hours	14	25.00%
	16-20 hours	11	19.60%
	21-25 hours	7	12.50%
	26-30 hours	5	8.93%
	30 + hours	4	7.14%
Played on console	PC	55	98.20%
	Nintendo Wii	50	89.30%
	Xbox 360	49	87.50%
	Sony PS2	45	80.40%
	Sony PS1	40	71.40%
	Xbox	40	71.40%
	Sony PS3	38	67.90%
	Nintendo DS	36	64.30%
	Sony PSP	36	64.30%
	Nintendo GameCube	36	64.30%
Preferred Game Genre	First Person Shooter		4.20 (.84)
	Action		3.86 (.92)
	Shoot 'em up		3.80 (1.05)
	Adventure		3.66 (1.05)
	Fantasy		3.46 (1.14)

Platform	3.29 (1.02)
Beat 'em up	3.04 (1.24)
Fighting	3.02 (1.10)
MMORPG	2.95 (1.44)
Puzzle	2.93 (1.01)
Racing/Driving	2.63 (1.05)
Sport	2.34 (1.48)

Descriptive analysis was conducted on the trait aggression scores, including the sub-scales for all participants (see Table 16 below).

Table 16: Descriptive analysis of trait aggression and the sub-scales

Measure	*M*	*SD*	*Min*	*Max*
Physical aggression	24.16	9.14	11.00	57.00
Verbal aggression	19.68	6.90	5.00	33.00
Hostility	24.21	10.49	8.00	49.00
Anger	19.21	7.45	9.00	40.00
Total Aggression	87.27	24.36	40.00	168.00

Descriptive analysis was conducted on the nine flow dimensions, including mean flow scores for all participants (see Table 17 below). Table 15 shows that deep concentration was rated the highest of all the flow dimensions (M = 4.29, SD = .54), and distorted sense of time as the lowest (M = 3.29, SD = .63). Mean flow was calculated as 3.87 (SD =.37). This score was used for subsequent analyses.

To ensure consistency with previous theoretical assumptions on the occurrence of flow (Massimini & Carli, 1988), a correlation was conducted between the sub-scales of "balance of skills and challenges" and "autotelic experience". The results showed that there was a significant positive correlation between them (r = .50, $p < .001$), suggesting that an equal balance between the challenge of the game and gamers' skills were positively associated with the overall experience derived from the activity. This further suggests that flow was experienced in gaming, as flow theory assumes that the condition of a skill-challenge balance facilitates feelings of enjoyment.

Table 17: Descriptive analysis of flow dimensions

Dimension	M	SD	Min	Max
Skill-challenge balance	3.93	.50	2.25	5.00
Mergence of action and awareness	3.69	.76	2.00	5.00
Clear goals	3.96	.64	2.00	5.00
Unambiguous feedback	3.88	.56	2.75	5.00
Deep concentration	4.29	.54	2.50	5.00
Sense of control	4.10	.53	2.50	5.00
Lack of self-consciousness	3.84	.83	2.00	5.00
Distorted sense of time	3.29	.63	2.00	5.00
Overall autotelic experience	3.82	.59	2.25	5.00
Mean Flow	3.87	.37	2.86	4.94

5.4.2. Flow and Affective measures

Descriptive analyses were conducted on the affective measures (positive mood, negative mood, activation and deactivation) for the pre and post-test scores for all participants (see Table 18 below).

Table 18: Descriptive analyses for pre and post test affect measures for all participants

Measure	Time			
	Pre-test		Post-test	
	M	SD	M	SD
Positive Affect	3.11**	.64	3.60**	.67
Negative Affect	1.22	.33	1.19	.26
Activation	2.36**	.48	2.82**	.47
Deactivation	2.59**	.47	2.04**	.57

*$p < .05$ ** $p < .001$

Four paired samples t-tests were conducted to examine the differences between pre and post test gameplay on the four affect measures. The analysis revealed that positive affect ($t(55) = -6.04$, $p < .001$) and activation ($t(55) = -6.29$, $p < .001$) were

significantly higher after gameplay. Deactivation was significantly lower after gameplay (t (54) = 8.17, $p < .001$). No significant differences were found in negative affect between pre and post test conditions (t (55) = .86, $p = .40$), although the post-test mean negative affect score was slightly lower than at pre-test.

Descriptive analysis was conducted on the pre and post test affect scores and for flow between game conditions (see Table 19 below). Four mixed between-within ANOVAs were conducted for each of the affect measures to examine the changes in affect scores between pre and post test.

Table 19: *Descriptive analysis of pre and post-test affect and flow scores between game conditions*

Measure	Half Life 2				Halo 3			
	Pre-test		Post-test		Pre-test		Post-test	
	M	SD	M	SD	M	SD	M	SD
Positive Affect	2.99	.54	3.57	.65	3.21	.69	3.61	.70
Negative Affect	1.30	.43	1.24	.32	1.16	.23	1.15	.19
Activation	2.29	.43	2.84	.46	2.42	.52	2.81	.49
Deactivation	2.73	.49	2.22	.62	2.48	.42	1.87	.50
Flow			3.91	.33			3.83	.40

Note: No pre-test measures of flow were taken

 Positive affect

A mixed design ANOVA (2x3x3) was conducted to examine the impact of game condition (highly violent versus mildly violent), flow (low, medium and high) and trait aggression (low, medium and high) on changes between pre and post test measures of positive affect. Participants were divided into three groups according to both their flow (low, medium, high) and aggression scores (low, medium, high). The main effect comparing pre and post-test positive affect was significant, [F (1, 43) = 7.50, $p < .01$, partial eta squared = .15], suggesting a significant increase in positive affect scores after gameplay (Table 18). There was a significant interaction effect between flow and changes to positive affect (Wilks Lambda = .85, F (2, 43) = 3.82, $p < .05$, partial eta squared = .15), indicating that experiences of flow in gameplay were

associated with increases in positive mood (see Figure 2 for interaction[6]). This indicates that enhanced flow experiences (i.e. high and medium flow) are associated with the greatest increases in positive affect. Interestingly, positive affect scores in the low flow group showed a different pattern compared to the medium and high flow groups. Specifically, positive affect scores decreased from pre to post test in the low flow group. Trait aggression $(F_{(2, 43)} = .16, p = .85)$ and game condition $(F_{(1, 43)} = .59, p = .45)$, however, did not show any significant main effects or interactions with changes in positive affect.

A one-way ANOVA was conducted to assess any between condition effects of flow condition on positive affect scores both at pre and post test. Results showed that there were no significant differences between flow conditions on positive affect at pre-test $(F_{(2, 54)} = 2.72, p = .075)$, whereas there were significant differences at post-test $(F_{(2, 54)} = 3.26, p < .05)$. Specifically, post-hoc comparisons revealed the differences were between the low and high flow groups $(MD = 1.18, p < .05)$.
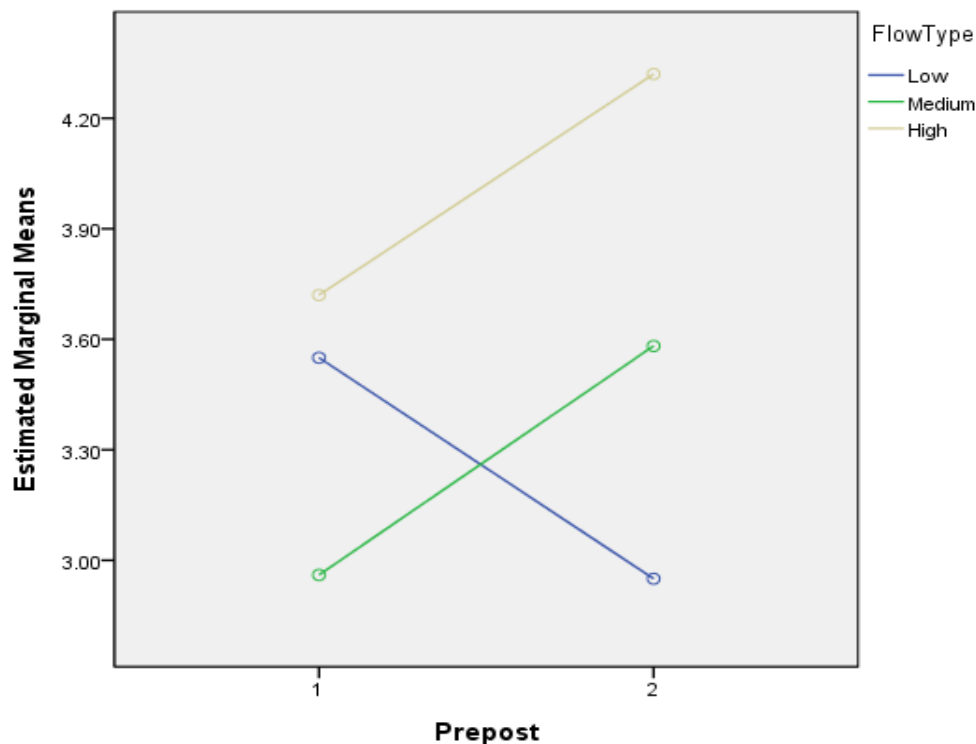

Figure 2: Interaction of flow on pre to post test measures of positive affect

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[6] Pre-test positive affect means by flow condition: low = 3.55; medium = 3.03; high = 3.60
Post-test positive affect means by flow condition: low = 2.95; medium = 3.54; high = 4.13

Negative affect

A mixed design ANOVA (2x3x3) was conducted to examine the impact of game condition (highly violent versus mildly violent) flow (low, medium and high) and trait aggression (low, medium and high) on changes between pre and post test measures of negative affect. Participants were divided into three groups according to both their flow (low, medium, high) and aggression scores (low, medium, high). The main effect comparing pre and post-test negative affect was non-significant, [F (1, 43) = .62, *p* = .44, partial eta squared = .01], suggesting no significant changes in negative affect scores after gameplay (Table 18). There were no significant main effects or interactions between flow and changes to negative affect (Wilks' Lambda = .98, F (2, 43) = .36, *p* =.70, partial eta squared = .02), trait aggression (Wilks' Lambda = .96, F (2, 43) = .82, *p* = .45, partial eta squared = .04), or game condition (Wilks' Lambda = 1.00, F (1, 43) = .05, *p* = .82, partial eta squared = .001).

Activation

A mixed design ANOVA (2x3x3) was conducted to examine the impact of game condition (highly versus mildly violent), flow (low, medium and high) and trait aggression (low, medium and high) on changes between pre and post test measures of activation. Participants were divided into three groups according to both their flow (low, medium, high) and aggression scores (low, medium, high). The main effect comparing pre and post-test activation was significant, [F (1, 43) = 11.95, *p* <.01, partial eta squared = .22], indicating a significant increase in activation scores after gameplay (see Table 18). There was a significant interaction between flow and changes in activation (Wilks' Lambda = .76, F (2, 43) = 6.68, *p* <.01, partial eta squared = .24), indicating that experiences of flow in gameplay results in increased activation (see Figure 3 for interaction effect[7]). This suggests that enhanced flow experiences are associated with the greatest changes in activation from pre to post test. However, similarly to the changes in positive affect scores for those in the low flow group, activation scores decreased from pre to post test in the low flow group. No significant main effects or interactions were observed for trait aggression (Wilks' Lambda = .99, F (2, 43) = .24, *p* = .79, partial eta squared = .01), or game condition

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[7]Pre-test activation means by flow condition: low = 2.60; medium = 2.34; high = 2.40
Post-test activation means by flow condition: low = 1.90; medium = 2.80; high = 3.17

(Wilks' Lambda = 1.00, F (1, 43) = .02, p = .88, partial eta squared = .001) on changes in activation after gameplay.

A one-way ANOVA was conducted to assess any between condition effects of flow condition on activation scores both at pre and post test. Results showed that there were no significant differences between flow conditions on activation at pre-test (F (2, 54) = .28, p = .759), whereas there were significant differences at post-test (F (2, 54) = 6.87, p < .01). Specifically, post-hoc comparisons identified differences between low and medium (MD = .90, p < .05), and low and high flow groups (MD = 1.27, p < .01).
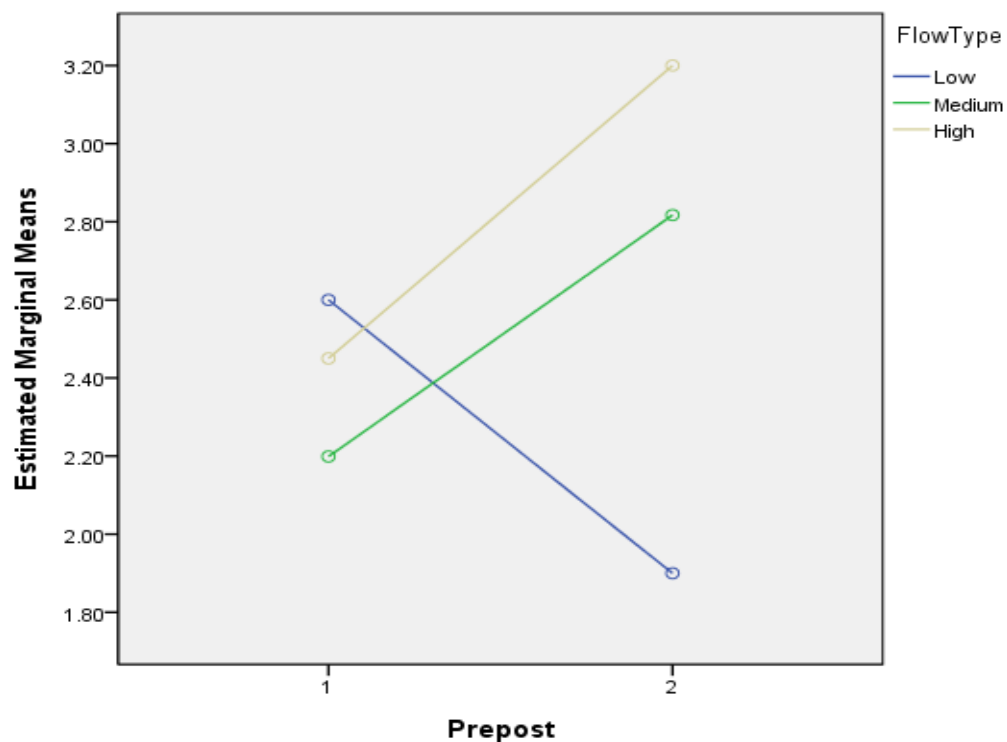
Figure 3: Interaction of flow on pre to post test measures of activation.

Deactivation

A mixed design ANOVA (2x3x3) was conducted to examine the impact of game condition (highly versus mildly violent), flow (low, medium and high) and trait aggression (low, medium and high) on changes between pre and post test measures of deactivation. Participants were divided into three groups according to both their flow (low, medium, high) and aggression scores (low, medium, high). The main effect comparing pre and post-test deactivation was significant, [F (1, 43) =28.87, p <.001,

partial eta squared = .41], indicating a significant decrease in deactivation after gameplay (see Table 18). There was a significant interaction of game condition (Wilks' Lambda = .82, F (1, 43) = 9.15, $p < .01$, partial eta squared = .18), indicating that there was greater deactivation following gameplay of *Halo 3* compared with *Half Life 2* (see Figure 4 for interaction effect). No main effects or significant interactions were observed for flow (Wilks' Lambda = .91, F (2, 43) = 2.02, $p = .15$, partial eta squared = .09), or trait aggression (Wilks' Lambda = 1.00, F (2, 43) = .02, $p = .98$, partial eta squared = .001) on changes in deactivation.

An independent samples t-test was conducted to assess the between condition effect of game condition on deactivation at both pre and post test. Results showed that there were no significant differences between the game conditions in deactivation scores at pre-test (t (53) = 1.96, $p = .06$). At post-test, however, significant differences between the game conditions on deactivation scores were observed (t (54) = 2.30, $p < .05$).
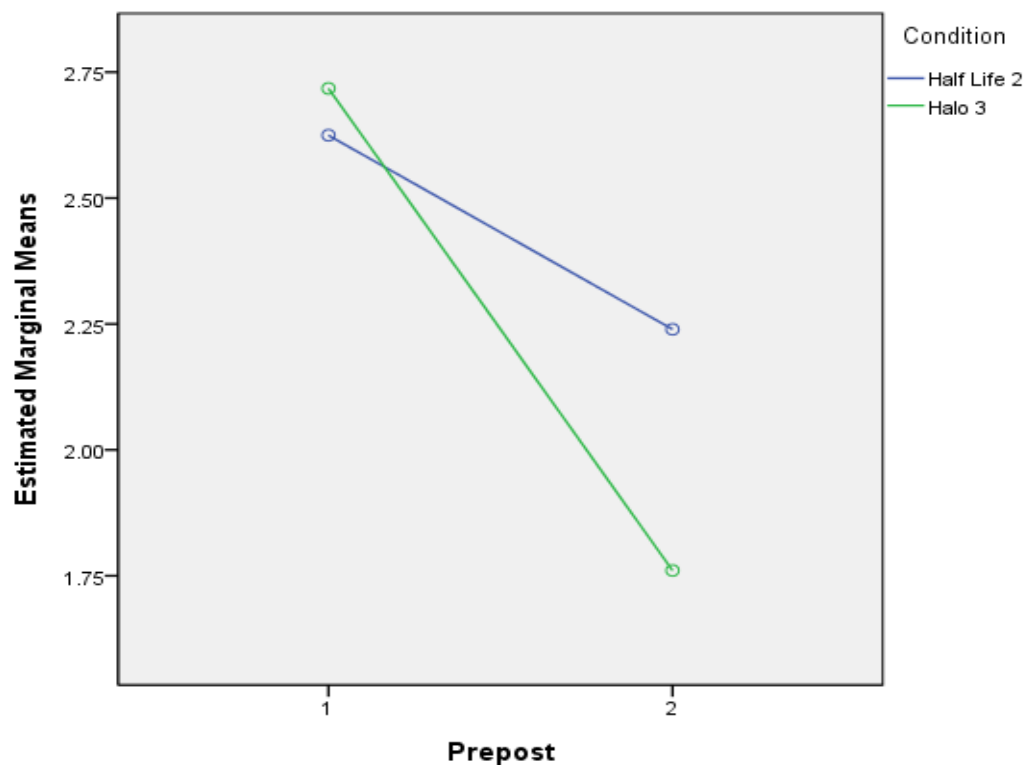

Figure 4: Interaction of game condition on pre to post test measures of deactivation.

5.4.4. Flow and psychological well-being

Correlations were conducted to examine the relationship between flow in gameplay and measures of psychological well-being. Table 20 below presents this information, including overall means and standard deviations of flow and the dimensions of psychological well-being.

Table 20: Pearson correlation of mean flow with dimensions of psychological well-being

Measure	*M*	*SD*	*2*	*3*	*4*	*5*
1 Flow	3.87	.37	.29*	.33*	.22	.24
2 Total Life Satisfaction	56.46	7.41		.50**	.36**	.44**
3 Pleasure	3.47	.78			.47**	.75**
4 Anxiety-Contentment	4.27	.71				.55**
5 Depression- Enthusiasm	4.55	.79				

$** p < 0.01 \quad * p < 0.05$

Flow was positively correlated with pleasure (r = .33, $p < .05$) and total life satisfaction (r = .29, $p < .05$), but not with anxiety-contentment (r = .22, $p = .11$) or depression-enthusiasm (r = .24, $p = .08$).

5.5. Discussion

Study 2 aimed to examine the associations of flow in gameplay and affective outcomes, and whether this differed as a product of game condition. It also aimed to examine the relationships between flow and aggressive personality on the psychological and affective outcomes of gaming, as no research to date has examined these links within the context of gaming.

The results showed increases in positive mood and activation from pre to post-test measures, and that the level of flow experienced during gaming significantly interacted with these changes. This indicates that playing videogames can enhance mood and that experiences of flow are associated with greater enhancement. Interestingly, those participants in the low flow group showed a different pattern of results compared to the medium and high groups. Specifically, there were decreases in positive affect and activation from pre to post test. This suggests that participants in these groups did not experience typical flow experiences, or did not experience flow

at all during gameplay. This may have been as a result of the fact that game choice was not freely chosen within the experimental context. This may have been inconsistent with these participants' usual game preferences, resulting in lack of enjoyment, and potentially negative experiences of frustration or disappointment. This could explain the lack of increase in positive affect scores in these participants. Regardless of this, the fact positive mood and activation scores increased consistently in medium and high flow groups suggests flow in gameplay is associated with positive changes in affective states.

Game condition did not significantly interact with changes in the majority of the pre to post test measures of affect. As the games were controlled for all game characteristics except their violent and aggressive content, these results suggest that the differences in content did not influence participants' gaming experiences. Rather, the actual process of play and the experience had a greater influence on associated positive outcomes. This presents an alternative perspective to the traditional media violence effects approach, which tends to over-estimate the influence of violent game content on gaming outcomes. The current findings suggests that potential negative outcomes may be counter-balanced by the positive experiences which can be derived through gameplay processes. This suggests the importance of examining gaming processes and experiences within a broader context, to better understand the associated outcomes of gaming. As this has not previously been examined, the current research offers new evidence which is consistent with the assumptions of flow theory. This suggests that understanding gaming experiences from a more holistic perspective is integral to examining the potential outcomes of gaming. Future research should address the processes of gaming rather than focusing too exclusively on the outcomes of exposure to violent content. The extent to which game violence is important for game enjoyment, and whether gamers' attitudes towards it influence attitudes and behaviour is unknown. Study 3 follows up this issue through the use of qualitative methodology to explore the meanings which gamers' derive from their gaming experiences.

The results of the ANOVA showed that there were decreases in deactivation after gameplay between pre and post-test measures, and that the reductions were greater in *Halo 3* than *Half Life 2*. This suggests that playing the mildly violent videogame

(*Halo 3*) resulted in participants feeling less tired than those who played the highly violent game. This finding is difficult to explain, given that previous research has shown higher physiological arousal following violent compared to non-violent gameplay (Baldaro et al., 2004). The current finding could be due to the differences between the games in frustration scores which were identified in the pilot phase of the study. *Halo 3* was rated as more frustrating than *Half Life 2*, which could have increased levels of arousal/activation, resulting in greater reductions in deactivation (e.g., feeling less tired) after gameplay. This highlights the importance of acknowledging the complexity of videogames when conducting research of this nature. Differences in game structure and dynamics can lead to differential outcomes, suggesting the need for more rigorous pilot testing phases of the research process.

Flow was also positively associated with dimensions of psychological well-being. This finding is consistent with a substantial body of research showing the positive links between flow and psychological well-being (e.g., Bryce & Haworth, 2002; Haworth & Hill, 1992), and supports the findings in the previous study. It suggests that positive gaming experiences have wider psychological effects. It also suggests that flow is a useful theoretical and experiential framework within which to examine gaming experiences and effects, and requires further consideration when making assumptions about the negative effects of playing videogames.

There were no significant changes in negative affect from pre to post-test measures, and this was not influenced by game condition. This suggests that gaming has little negative affective detriment, and contrasts with findings of previous studies which have shown greater hostile affect following violent than non-violent game conditions (Carnagey & Anderson, 2005). This can be explained in a number of different ways. It could be argued that hostile affect is distinct from negative affect, resulting in different results between studies. Numerous methodological differences could also be potential explanations for the inconsistencies between studies. Firstly, sampling differences between studies may lead to differing outcomes, given that the current study used regular gamers in contrast to the earlier studies which used convenience samples. It could be argued that convenience samples may be largely reflective of a non-gamer population, resulting in feelings of frustration and subsequent aggressive affect, from limited skill level in gameplay. Secondly, the type of design could lead to

different outcomes between studies. The earlier study used a between-subject design, examining differences between participants on outcomes measures. In contrast, the current study used a mixed design, including within-subjects comparisons, which reduced the potential confound of the individual differences influencing the results. Given the personal nature of gaming experiences (Calvillo-Gámez et al., 2010), within-subject designs are most relevant for empirical research as they provide a better examination of the experiences and outcomes for individuals, rather than between groups. This could be argued to be the most effective experimental design for this type of research. Thirdly, the earlier study compared three versions of a racing game (rewarded violence, punished violence and non-violent), in contrast to the current study which compared highly and mildly violent games. The distinctions in findings between studies could be as a result of the extent of the differences in violence conditions within studies. That is, highly versus mildly violent conditions may not differ to the same extent as violent versus non-violent conditions. This could potentially result in the earlier study finding greater differences in outcomes between violence conditions. Finally, potential differences in videogame technology between earlier research and the current study could have produced different gaming experiences and subsequent effects.

Trait aggression did not interact with any of the changes to affect, suggesting that personality had little influence on affective outcomes within the experimental context. To date, no experimental research has examined the influence of trait aggression on affective outcomes, although some studies have measured aggressive ones. For example, Bolton (2010) found evidence that trait aggression interacted with aggressive behaviours following highly violent compared to low-violent gameplay. The lack of influence of aggressive personality in the current study may result from the fact that very few participants were assigned to the high aggression group during the statistical analysis procedure. Issues surrounding statistical power of the data could potentially account for the lack of influence of trait aggression on changes to affect. Personality influences also require further examination within different gaming contexts, as the current study's findings were restricted to the laboratory, resulting in participants playing a pre-determined game, for a pre-determined time period. These influences could potentially be repressed within this context. Examining the influence of aggressive personality within real-life gaming contexts (e.g., reflections of gaming

experiences in everyday life, rather than within experimental settings), including social gaming would provide greater insight into its potential influence on affective outcomes. This is particularly relevant given the concerns over the proposed links between aggression and gaming. This issue will be further examined later in the research programme. It would also be interesting to examine the influence of aggressive personality on game preferences. That is, to what extent individuals high in trait aggression are motivated and enjoy playing highly violent games. Also, whether the flow experiences of highly aggressive individuals are enhanced during violent gameplay compared to less aggressive individuals. This would extend previous research which has shown that individuals high in trait aggression prefer violent games, and that those low in aggression prefer non-violent games (Przbylski et al., 2009), by examining the associated positive experiences of gameplay. Further, an examination of the preferred type of gameplay (cooperative or competitive) would provide a useful extension of the current literature, since it might be predicted that highly aggressive individuals may prefer competitive compared to cooperative play. The influence of aggressive personality on positive gaming experiences and outcomes is largely under-established in the literature, and the associations between trait aggression, flow, and post-gameplay mood will be examined further in a subsequent chapter of the thesis.

A potential confound of the study was gamers' preference for videogame genres, and whether the videogame played for the purposes of the study was consistent with that preference. A gamer who derives the greatest enjoyment from driving games, for example, may not derive such a positive experience from playing a First-Person Shooter game, as was used in the current study. Demographic analysis of the ratings of game genre, however, showed that First Person Shooters had the highest preference rating of all the measured game genres, suggesting that the game choices were appropriate for the current study. It is also possible that gamers who consider themselves to be "PC gamers" may experience gameplay within the current study less positively than those who regularly play on television-based consoles (e.g., *Xbox 360*). Demographic analysis, however, suggested that a large majority of the sample had played on more than one console, including the *Xbox 360*. This suggests that most of the sample were familiar with the console used in the current study. The extent to which the participants were familiar with the individual games used in the study is

unclear, as is the extent to which this may have influenced the results. It was assumed that all participants were equally familiar with games, but this was not explicitly measured. A lack of familiarty with the allocated games could raise questions about the assumption that partipants were suitable for the purposes of the research. However, the recruitment of participants through targeted sampling suggested that they were at least regular gamers, and would have been competent to meet the demands of the games and technology used in the study. Using non-gamers for experimental research presents fundamental practical problems since the skill level required to progress in the game is likely to be rare in this particular group. It is conceivable that previous experimental studies which have used samples of psychology undergraduate students do not represent gamers and cannot fully examine real life gaming experiences, due to their potential lack of competency in gameplay. Self-Determination Theory proposes that when individuals experience feelings of competence in activities, they also experience greater self-esteem and positive affect (Ryan et al., 2006). The current study used a suitable sample of videogamers, and so can accommodate this notion to a greater extent than previous lab-based studies. The finding that positive affect was significantly higher following gameplay and that negative affect did not increase provides some support for this contention. This has implications for previous studies which have shown greater aggressive outcomes following exposure to videogames, as these outcomes could be attributed to greater negative affect, derived from lack of competency with games technology in the lab setting.

The current study used two different videogames representing highly violent and mildly violent game conditions. Research has suggested the use of two different games leads to methodological difficulties with comparing conditions (Klimmt & Trepte, 2003; Ladas, 2002). However, the pilot study was conducted as a means of controlling the game characteristics between the two conditions. Although the pilot study was limited by a small sample size, and the alpha value was not reduced for the number of pair-wise comparisons conducted on the data, an attempt was made to control for differences between the games more effectively than in previous studies. Reducing the alpha level could have potentially increased the chances of making a Type II error when interpreting the pilot data. This is particularly relevant as the majority of pair-wise comparisons were looking for non-significant differences between ratings. It would perhaps have been beneficial to use different modifications

(mods) of the same game to better control for these differences in game characteristics when examining the influence of gaming experiences as a product of violent content rather than other game characteristics.

Future experimental research on videogaming should aim to use the most up-to-date videogames and advanced technology in order to examine psychological and social impacts on contemporary society. The need for advanced technology is highlighted by evidence that more immersive technology and quality of media features such as visual resolution, image size, and picture motion can influence responses to media (Bracken, 2005; Detenber, Simons & Bennett, 1998; Persky & Blascovich, 2008). Similarly, more positive experiences (e.g., higher presence and arousal) have been shown to be associated with playing newer than older games (Ivory, 2006; Ivory & Kalyanaraman, 2007). The current study represented a modern-day videogame experience by using recent commercial games which were presented through a large television monitor with high definition.

As with all experimental studies, there is the issue of a lack of ecological validity in the gameplay context. Since the current study required gamers to play in an artificial context, it could be argued that this was not a true representation of their real-life gaming experiences. The experimental environment differs from real-life both in relation to the social contexts of gaming and player autonomy. These issues are difficult to overcome in experimental studies, suggesting the need to use alternative methods. The use of qualitative methodologies can provide a more in-depth understanding of the influence of gaming contexts and diversity of gaming experiences on the associated outcomes for individual gamers. Issues such as individual gaming motivations for particular games, the range of gaming experiences, and influences of different game aspects on the psychological and social outcomes of the activity remains relatively unclear in the literature. Study 3 therefore aimed to address these issues to a greater extent.

CHAPTER 6: STUDY 3

6.1. Introduction

Research on videogames has tended to focus on violent content and consequences for aggressive-related outcomes (Bluemke, Friedrich & Zumbach, 2010; Mőller & Krahe, 2009). The gameplay experiences of representative samples of gamers have not been well established. Understanding the diversity of gaming motivations and experiences, and their influence on the potential outcomes of the activity requires the use of qualitative methodologies to explore the *"the subjective relation between the user and the videogame"* (Calvillo-Gάmez et al., 2010; pp. 47). This implies that gaming is a highly personal experience which varies as a function of both the player and the game. There is minimal evidence, however, of the use of qualitative methodology to examine these issues in the empirical literature.

A handful of studies have utilised qualitative approaches to examine gameplay experiences (Funk Chan, Brouwer & Curtiss, 2006; McVey, 1997; Provenzo, 1991; Reinecke, Trepte, & Behr, 2007). Hussain and Griffiths (2009) examined the experiences of Massively Multiplayer Online Role-playing games (MMORPGs). Key themes which emerged from the analysis were the construction of online gaming as a highly social activity, and an effective means for alleviation of negative feelings. Study 3 aimed to develop this finding by examining the positive and negative gameplay experiences of groups of regular gamers. It also aimed to develop the finding of Study 1 that gamers play for the positive feelings of enjoyment and flow which gaming provides. It aimed to extend this by examining the specific factors and aspects of games which promote these experiences. Qualitative research on *EverQuest* players identified that social and cooperative aspects of the game were appealing to gamers, and that exhilaration from mastering the challenges of the game was commonly experienced (Chappell et al., 2006). Online gaming has also been found to provide flow experiences, and experiences which are not always possible in the real world (Frostling-Henningsson, 2009). Features which have been suggested to lead to flow-like immersion for some types of online games are realistic graphics, sound effects and social interaction (Hussain & Griffiths, 2009). These are specific to online games, however, and so cannot be generalised to all game types. Study 3 addressed this issue across different game genres and contexts.

128

Interviews with children, parents and teachers (Provenzo, 1991), and with 8-16 year old boys (McVey, 1997) have found that high absorption during gameplay is a common experience for players, and that action and violence in videogames is particularly appealing to children. The issue of violent content in games is particularly important given the substantial research which examines its influence on gaming consequences. There is minimal research examination, however, of gamers' experiences of, and attitudes towards violent game content. A noteworthy study by Pzybylski et al. (2009) quantitatively examined the motivating role of violent game content for game enjoyment. They found that violence did not enhance game enjoyment. Contrary to this finding, research has suggested that exposure to violent media content can enhance arousal which can be enjoyable (McCauley, 1998). Evidence also suggests that perceptions of violence are variable, depending on the level of graphics and explicitness of the displays of violence (Riddle, Eyal, Mahood & Potter, 2006). Several contextual characteristics have been proposed to influence the degree to which an act in the media is considered violent (Forgas, Brown & Menyhart, 1980; Gunter, 1985). These include: the physical form of the violence, the degree of harm to the victim, the realism and physicality of the setting, the justifiableness of the act, the degree of provocation and the degree of gamer control in the act. Although these studies present initial evidence of the role of game violence in gaming experiences, there is contradictory evidence of this influence, and the studies do not specifically focus on the attitudes of the people playing games or address questions about why violence may be important in certain types of games. Study 3 aimed to address this gap in the literature by examining gamers' attitudes towards game violence, and their opinions of the way violent game content influences attitudes and behaviour.

It is also useful to further examine the motivations for gaming to better understand the gameplay experience, as the way an individual experiences a particular game will be determined by their motivation for playing it. Research has typically identified categories of gamer based on general gaming motivations such as social, achievement and immersion-orientated gamers (Yee, 2007). Although these categories provide some indication of motivations for playing videogames, they cannot identify specific motivations for particular game genres or players. Such an approach is somewhat

restrictive and assumes there to be no differences within individuals in their reasons for playing certain types of videogames.

Adopting an alternative approach to studying *player* motivations, is research which identifies gaming motivations for specific *types* of games. Sports videogames (Kim & Ross, 2006), *Nintendo Wii Boxing* (Pasch, Berthouze, van Dijk & Nijholt, 2008), browser games (Klimmt, Schmid & Orthmann, 2009), and role-playing games (Tychsen et al., 2008) are among the game types which have been examined in the literature. These studies show that there are differences between these types of games in the key motivations for gameplay. For example, motivations for developing game characters are unique to role-playing games (Tychsen et al., 2008), compared to playing for liking of sport which is only relevant to sports videogames (Kim & Ross, 2006). This suggests that gaming motivations are game-specific, but no empirical research has systematically compared motivations between game genres. As gaming is a highly idiosyncratic experience, research using qualitative methodologies in order to examine the idiographic nature of these motivations is required.

Focus group research examining the outcomes of playing videogames has found that although gaming can have psychological and social drawbacks (e.g., frustration and a loss of reality), these are out-weighted by the benefits derived from gaming (e.g., sense of accomplishment, fantasy and stress-relief) (Funk et al., 2006). This presents evidence of the range of different outcomes of playing videogames, but does not indicate the influence of gaming experiences. Understanding the nature of gaming experiences is useful for understanding its potential outcomes. Although Study 2 examined the association between flow in gaming and positive mood and activation following gameplay, it did not explore the influence of diversity of experiences on differential outcomes. That is, the experimental approach was a little restrictive in examining the range of experiences both between and within individuals, and how these experiences were associated with a range of outcomes. Study 3 aimed to examine this issue in greater depth by asking gamers about their feelings during and after playing, and whether this varied as a function of specific games or game genres.

In summary, Study 3 aimed to develop from the results of previous research and Study 1 by further exploring the diversity of motivations for gaming. It also aimed to

examine the range of gaming experiences and consequences through a series of focus groups, using a sample of regular gamers. A number of research questions were devised to "hear the voices" of gamers on their attitudes towards and experiences of gaming.

The objectives of the study were:

1. To examine the extent to which gaming motivations vary for individual gamers and game genres.
2. To explore the experiences derived through gaming.
3. To identify the specific characteristics of videogames which facilitate positive and negative gaming experiences.
4. To examine the psychological, affective and social consequences of gaming.
5. To explore gamers' attitudes towards game violence, and the claims that violent game content is linked to real-life violent behaviour.

6.2. Method

6.2.1. Participants

Homogenous groups of regular videogamers were recruited through targeted sampling of students enrolled on Computer Game Development and Game Design degree programmes at the University of Central Lancashire. The sample included 16 males and one female, and all participants were aged between 18 and 24 years old.

6.2.2. Procedure

A series of four focus groups were conducted, each including four or five participants. This number of participants was chosen since smaller group formats allow each participant to have a greater amount of time to share their thoughts and can allow for more in-depth descriptions of the issues (Hughes & Dunmont, 1993). Furthermore, each of the focus groups consisted of established friendship groups which facilitated discussions on shared social gaming experiences. Each focus group session lasted between one to one and a half hours, depending on how each group responded to the discussion. The sessions were concluded once the researcher felt that all relevant issues had been covered and when participants indicated that they had nothing further to contribute.

Agenda: The focus group sessions commenced with a welcome, including an introduction of the researcher and the overview of the purpose of the research programme. Following this, a review of the session goals was outlined and ground rules were established. The purpose of the recording equipment was also mentioned at this point. Next, participants were asked to complete a demographics questionnaire and sign a consent form (see Appendix 5). Introductions of the group members were conducted before the main discussions took place. Following the main discussions, participants were encouraged to ask any questions relating to the research, and were thanked for their participation.

The agenda was developed by identifying a number of issues which have not received substantial empirical attention (please see Appendix 6 for a copy of the agenda). Open-ended questions were developed to allow participants to explore issues and share thoughts and opinions. Potential probes were noted for instances where more information might be sought. An example of a probe in this case is "does anyone else have any other similar experiences?" In addition, the sessions concluded with the researcher questioning whether focus group members had any further thoughts they wished to share. This was included to provide an opportunity to let participants make original contributions on issues they felt were important. Six issues were initially chosen to be addressed within the discussion sessions. These were as follows:

1. **Why do you play videogames?**

   What first got you interested in videogames?

   Why did you first start to play?

   What keeps you playing?

   Do you play different games for different reasons?

2. **Integration of gaming into daily life**

   How does gaming fit in with other activities?

   Does it interfere with other activities (e.g. coursework, chores, etc)

3. **Gaming experiences**

   What makes a good game/what makes it enjoyable?

What makes a bad game/what frustrates you?

How do you feel during and after playing? /Do you play to make yourself feel better?

4. **Violent game content**

   Importance of violence in games?/Do violent games make you more frustrated than other types of games?

   How do you feel about the claim that violent games make people aggressive?

   So what do you think about the implication of violent games in school shootings, in America, for example?

5. **Gaming outcomes/consequences**

   Any benefits of gaming? Educational uses?/ Skill development?

   Does gaming have any impact on your lives?

   Do you think there is anything bad about gaming?

6. **Any other comments**

   Is there anything else which anyone would like to add relating to anything we've discussed?

The first line of questioning asked participants to share their thoughts on what first got them interested in videogames. The purpose of this first issue was to encourage participants to become involved in the discussion, and to engage participants with their thoughts and experiences of the reasons why they played videogames, which was one of the key aspects of the research. The discussion was focused on the participants, and the researcher only actively participated in instances where participants felt they could not contribute any more to the current issue under discussion. In these cases, the researcher posed the next question.

All focus group sessions were recorded using a digital recorder for the purpose of full transcription of the discussions. Thematic analysis was used since it is a useful way of identifying, analysing and reporting themes in qualitative data (Braun & Clarke, 2006). It can also provide a rich, detailed account of data, which is not restrained by theory, in contrast to other qualitative analyses (e.g., conversation analysis; Braun &

Clarke, 2006). The analysis process was conducted in line with Braun and Clarke's (2006) suggested phases for thematic analysis. This commenced with the transcripts being read through a number of times to achieve familiarisation with the data, during which, initial ideas of themes were noted. Next, the data was coded by identifying relevant parts which corresponded with each code. Following this, codes were transformed into potential themes by collating relevant extracts to support these ideas. Next, a review of the themes was undertaken, to ensure they related to the data. Finally, extracts were chosen to represent themes to be used to produce a written report of the research.

6.3. Results

6.3.1. Gaming Motivations

Two categories of motivation were found in the analysis: "initial" motivating factors which encourage gamers to start playing, and "enduring" motivating factors which maintain gamers in periods of gameplay. Initial motivations consisted of playing games: (a) to alleviate boredom; (b) for fantasy; (c) to escape and (d) to relax. Enduring motivations for gameplay were (a) accomplishments in gaming; (b) curiosity; and (c) social factors. These will be discussed in detail below.

Initial motivations for gameplay

General distraction

Participants discussed their motives for playing videogames. It was particularly noteworthy that the motives were heavily "distraction"-based. That is, gamers start playing games as a way of distracting themselves from real-life, to forget real-world troubles, and to relax. Gaming to alleviate boredom emerged as a motivation, particularly for playing sports games. Other motivations were playing games for fantasy, specifically to undertake tasks which are impossible in real life. Gamers also discussed the importance of gaming for providing escapism which was mentioned in connection with the reasons they played games. This could be attributed to the fact that it was difficult to think about other things whilst gaming (e.g., it could provide distraction and relief from everyday stresses). It also emerged that playing games for escapism could also provide an opportunity for relaxation and to "unwind" from everyday stresses. Playing to relax was discussed in reference to specific game

aspects (e.g., graphics, sound) which could promote relaxation in gaming, and could therefore influence motivation for playing particular types of games. There appeared to be relative homogeity in participant responses on these particular motivations.

Illustrative Quotations

"I probably play sports like *Fifa* when I'm a bit bored maybe" (Male, FG 3)

"I'm probably playing it (*Gary's Mod)* because you get to stuff that is physically impossible in the real world, like time balloons to escape and make me float off..." (Male, FG 3)

"It's kinda nice to unwind after a hard day by just escaping from the real world for a bit....." (Male, FG 3)

"It's a form of escapism; sometimes you don't want to come back" (Male, FG 2)

I: "Distraction as well.
A: It *(gaming)* takes your mind off stuff.
Le: It does; you can't think while you're gaming
A: No.
Le: It gives your mind a rest doesn't it?" (FG 3)

"I hate the Motion thing on the *Wii*. I don't like picking up a controller and waving my arms around to play the game. I play to relax." (Male, FG 2).

"There's only so much work you can do; you've got to have fun sometime. You have to unwind" (Male, FG 2)

T: "Sometimes, it seems shallow, but the graphical aspects of games can be a big lure. I mean *Flower*; I played it through countless times...I know what to expect, I've mastered the gameplay...there's not really anything which should draw me back, but sometimes it's the entire experience of the whole sound, the graphics and stuff; it's just a pleasant experience, so I'll do it time and time again."
Mi: "Those are nice relaxing games." (FG 4)

Enduring motivations for gameplay

Accomplishments/Achievements

Gamers indicated that they continued to play games within specific gaming sessions because they wanted to accumulate game achievements or "level-up", and to experience the positive sense of accomplishment through game mastery. The opinions of all the participants on enduring motivations appeared to be relatively homogenous.

Illustrative Quotations

"I don't think it's an addiction to gaming; it's an addiction to winning. If you play games for the fun of it and you can't stop playing because you enjoy it then that's addicted to gaming, but if you play it to win, then for the win." (Male, FG 2)

"There are so many games I wouldn't have done half the stuff in and you just do it for the achievements. And once you've like finished the storyline, and there's still one or two achievements, you'll do them ..." (Male, FG 2)

"Yeah, in the past, if a game was bad, you would have stopped playing it but like now, with the achievements you kinda feel ....you want to get some of the achievements...." (Male, FG 2)

"I suppose with online games as well, the world is so huge and there's so much to do and with *World of Warcraft* added achievements into it, so there's so much to do. But when you've done most of it, it's like it's the same everywhere. You do reach a point of being addicted, and then you just think "I did this twenty hours ago, why am I doing it again?" (Male, FG 2).

"You can tell it's bad when you play a game late at night and you know you're tired but you just can't stop playing. You think "I'll just finish this level and then go to sleep or something". Male, FG 2)

Social

There was agreement that social connectedness and feelings of belonging with others could also explain prolonged periods of gameplay. Participants viewed social factors in online games as influential determinants for some gamers who show addictive tendencies. Gamers agreed that the social connections within online gaming could provide instant gratification for some people who are socially isolated, and could also be a mechanism promoting gaming addiction. One established friendship group of

gamers in Focus Group 3 discussed a shared experience in which they had postponed a social event in order to engage in social gameplay.

Illustrative Quotations

Ja: "I think with the likes of *World of Warcraft*, it's more like a social thing. And you're with a Guild and everything ...
D: A lot of online games are based around a community
Ja: So if you leave the game, you leave that community as well
D: And usually when you go back to it, you miss something interesting and it's like "damn!" (FG 2)

Li: So what is it about that game *(Left for Dead)* then that keeps you playing it?
Le: it's definitely something you can play with your mates that.
A: We even delayed a night out, didn't we?! (FG 3)

Curiosity

The intriguing nature of some games resulted in some gamers feeling that they were curious about "where the game would take them". This also explained why gamers maintained an interest in gaming sessions, and could determine returning to the game in the future. This was particularly relevant for narrative-based games which are characterised by strong storylines.

Illustrative Quotations

"It's (*Heavy Rain)* strong interactive narrative but it's good because you have control of the story where a character dies or not but it doesn't actually end there; the story continues but things are different. So I think that's appealing because it encourages you to replay it." (Male, FG 2)

"...with games with multiple endings it gives you are reason to go back again" (Male, FG 2)

"Well the whole "carrot-on-a-stick" aspect in some games. There's always something ready to unlock or something interesting just round the corner, just out of reach, kind of like chasing the dragon ...you know it's usually something that just keeps you playing, just something like that. That's usually a good factor which makes you carry on playing" (Male, FG 4)

Specific gaming motivations

A number of other factors were identified as determinants of gameplay (i.e., available time, specific game, and mood of the gamer). Gamers felt that motivations for playing videogames were heavily dependent on the specific type of game. For example, people may play racing games to see how close it is to real life. On the other hand, people might play shooting games simply for fun. Gaming motivations for playing specific types of games were also dependant on gamers' mood. For example, one gamer identified that the game he played was determined by whether or not he wanted to play with friends or be alone.

Gaming motivations were also heavily dependent on the amount of time available to play games. Some games require greater time investment and so cannot be played if limited time is available. In these instances, gamers suggested that mini games such as *Little Big Planet* were more likely to be played. One group discussed this issue with reference to other activities (e.g., University courses), and outlined that they did not have enough time to play "story-heavy" games (e.g., *Uncharted 2*), and so tended to play smaller, less intense games instead.

Illustrative Quotations

Dependant on game

"I think it depends on the game really as to why you play it. Because obviously you play like a "shoot 'em up" for something to mess about with. You play a simulation to see how close it is to the real thing. Especially on motor racing and things like that." (Male, FG 2)

"I'd argue that there's two types of games. There's a narrative-based game, that draws you in with the storyline. While it might not have a multiplayer aspect, it has an involving plot and it's pretty much a movie, but you play a character. And then you've got the social interaction, online game play-based game like *Unreal Tournament* which are just a good laugh to play with your friends online or if you get bored, just pick up and play, and then just put it down. Narrative ones, you've got to get more involved in and be there for a few hours." (Male, FG 4)

"Puzzle games for example, are played more for achievement factors and encourage you to keep playing." (Male, FG 1)

Dependant on mood

"I play RPGs when I'm like on my own but if I've got people around, I'll play like fighters or shoot em ups. I depends if I want to be social or just play on my own." (Male, FG 3)

"Sometimes I'm completely burnt out when I've been designing games all day and when I get home it's like, I'll turn on the *PS3*, I'll look through my stack of games, which is quite formidable, and it will be that "I'm not in the mood for playing any of these." (Male, FG 3)

Dependant on time available

"I play *Little Big Planet* when I've got like half an hour to kill coz it's such an awesome game! And when I've got a couple of hours, I just stick on *Batman*." (Male, FG 3)

"It depends how much time I've got because you can't really get into a game in just 45 minutes but there's just pick-up-and-play ones you can just play for a little bit." (Male, FG 3)

T: "You'll get all these immersive huge games but I'm not willing to sink my own amount of time into them anymore. I'll be spending most of my time, when I'm on games, on smaller, downloadable titles which don't have as an epic a storyline, there's deep game-play mechanics so.....Stuff like *Trash Panic* or *Quest for Booty* and stuff are relatively small games and I'd be playing those a hell of a lot more than I would *Fallout 3* or *Uncharted 2*."

Ma: "I think with lack of time we might have now in our third year, trying to finish a game...coz usually when I play a story-heavy game back at college or whatever, I could finish it in one sitting, and now you don't usually have the hours to finish it in one sitting nowadays. And it breaks the story away a bit."

Mi: "That's one thing with RPGs. Given time away from RPGs is the bane of RPGs. Like *Lost Odyssey* for example, I didn't play it for about a month, I came back to it and I had no idea what was going on because the story-line is so vast that's it's easy to lose where you were."

Ma: "I think as well, when I was younger, I used to play RPGs a lot, like 50 hour plus ones, and nowadays, with *Lost Odyssey* as well, when I started playing that last year, I couldn't be bothered with it."

R:" You need a game that you can pick up and play for fifteen minutes and put it down again." (FG 4)

6.3.2. Gaming Experiences

A number of key gaming experiences emerged from the analysis. These were: enjoyment/fun; relaxation/stress-relief; distraction/escapism; flow and frustration. It also became clear that specific game aspects were particularly influential for the facilitation of these experiences. Although participants agreed these were relevant gaming experiences, it was clear that these varied as a result of type of game and social gaming context. One participant in Focus Group 4 seemed particularly focused on the influence of game graphics aesthetics on gaming experiences. These will be discussed in greater detail in the following sections.

Fun/Enjoyment

A strong theme which emerged was that gaming was a fun and enjoyable activity. Several game aspects which were particularly influential for these positive experiences were story aspects, socialisation, violent content, and game aesthetics.

Storyline/Storytelling

Gamers felt that it was important to be given choices in specific types of games and have freedom to deviate from a linear plot-line. Some gamers felt restricted when the game storyline was too linear. The ability to choose within games was also important for game enjoyment. This could arise from feelings of being in control within the game world. Aspects of storytelling could also enhance feelings of enjoyment in gaming, which was often described as being equivalent to the experiences of reading a good book.

Illustrative Quotations

"Mostly 'cause is fun and it's an open game so you can do whatever you like, whenever you like. You're not stuck to doing a linear story. So it's pretty fun doing that." (Male, FG 2)

"They *(the game developers)* railroaded you quite heavily through the story as well so there's no deviation from the plot line whatsoever.... which isn't that much fun. It's nice to be able to choose what you want to do in a game." (Male, FG 4)

"But sometimes I like a more open-ended game though. That's one reason why I didn't like *Assassin's Creed*. They say it's a sandbox, but it's proper linear." (Male, FG 3)

"The ability to choose in a game is great though." (Male, FG 4)

"There's a game recently called *Operation Flashpoint 2* .....based on an island in Alaska, in a two hundred kilometre square island and when you get the game you're like "great; I'll be able to trek through this two hundred kilometre square island". But all the missions are planned out for you, so it's linear so it spoils the fact that you've got a two hundred kilometre square island" (Male, FG 4)

"The exploration aspect is very important, rather than being rail-roaded. It's enjoyable to be able to do what you want..." (Male, FG 4)

"It's the freedom to choose in the game which makes it enjoyable." (Male, FG 4)

"I love storytelling in a game. When it's done well, it makes the game." (Male, FG 2)

"The fun, how epic some of the games' storylines are. Some games, the storyline can equal a decent novel. (Male, FG 4)

Social

Social aspects of gameplay were particularly influential in relation to positive gaming experiences. These included feelings of social connectedness and social belonging which could occur in both online and offline gaming contexts. Gamers particularly identified *Nintendo Wii* games when discussing the social components of gaming experiences, and felt that these were only fun when played with other people. Gamers also agreed that although playing games with others was fun, this enjoyment was enhanced when playing with actual friends rather than with "random" people or virtual friends. Playing games with others was also discussed as being an effective way of social integration between players to enhance a positive social atmosphere.

Illustrative Quotations

"I think the *Wii* is only fun when it's not just you playing alone, when a group of people are playing together ..." (Male, FG 2)

"It doesn't matter if it's online or at your house-if you play with your friends, it definitely is a lot more fun than when you're playing with random people." (Male, FG 3)

"I play online with a group of friends in a clan and I enjoy the competitive play of that and being part of a community online." (Male, FG 4)

"I think a few of us, and people we live with, we play on *Kill Zone* and make clans. On online games is a lot more fun when you're playing with your actual friends, you actually know and talk with. It's an extra element of fun." (Male, FG 4)

"Well sometimes there's just the whole multiplayer aspects, not so much online even but for *Guitar Hero*, you'll be playing around and some people who have never played before maybe will come in and they'll see the stupid grin on your face and then they'll fancy a go and it's a good thing to create a mood or even just breaking the ice in a conversation, something like that." (Male, FG 4)

"The online play has been important. I've been moving around quite a bit since I moved to the UK from about the age of eight, then to London, to Preston. So the friends I have left, I've managed to keep in contact with in real life so speaking to them online has been quite nice otherwise I would have lost that connection to them." (Male, FG 4)

"...if you're playing with your friends then you feel like a proper team almost, so you've got to do something. I mean, in general you always need four real people..." (Male, FG 3)

"It can be quite fun to have a few of your friends playing *Fifa* and you can eat and drink at the same time- it can be quite fun. I mean you can't really eat and drink while you're playing football!" (Male, FG 3)

Violence

Gamers viewed violent game content in a positive way and felt that it could enhance game enjoyment, if it was suitable for the type of game. Gamers commented that violence in games could often make them more fun, and provide them with an opportunity to engage in activities they could not necessarily do in real life. They also remarked that the type of game was a heavy determinant of the need for violence. For example; social games such as *Animal Crossing* would not be suited to violence, whereas Shooter games would be ineffective without violence. Therefore, the need for violence and the associated experiences are game-specific.

Illustrative Quotations

"Violence is fun though, even though it shouldn't be. In games it's fun." (Male, FG 3)

"Not very important but it can make a game fun. *Brutal Legend*-on the first cut scene it was the option to turn the gore on or off, and I've never turned it off just because it makes the cut scenes more fun" (Male, FG 2)

"I think without some form of aggression and violence, it would be a bit poor because not everyone's a precise driver, they all want to ram people out of the way-it's more fun, isn't it?" (Male, FG 3)

"You sit there with your sniper rifle, just shooting off all their limbs, just because. Just to watch them hobble about, and to see how they move with one leg and stuff-awesome!" (Male, FG 3)

"Because it's something that you will never do......You can commit something that you'll never have a chance to in real life." (Male, FG 2)

" I like violence in games because it's the only time you can see it."(Male, FG 2)

Dependant on game

The importance of violent game content was discussed in relation to game type. Although gamers agreed that violence could make some games more fun, it was agreed that violence was not necessary for all types of games, and was not always an essential component for game enjoyment.

Illustrative Quotations

"I think it is necessary, the violence in games because you could have like *Call of Duty* and be throwing daisies at each other; it wouldn't have the same effect would it?" (Male, FG 3)

"It *(violence)* doesn't necessarily have to be in every game but it can enhance the game." (Male, FG 3)

" *Fable 2* didn't have any gore or anything and that was great fun to play." (Male, FG 4)

"...there are games like *Viva Pinata*, it's an amazing game, I don't care with anybody says, and contains no violence what so ever. Although on the other side of things, you can have stuff like *Halo*, which again, is a great game and that's nothing but....." (Male, FG 2)

T: "It depends on the game entirely...."
Mi: "....Like *Gears of War*, for example, the violence in that suits the game. You couldn't put..."
T: "You couldn't go around shaking their hands all the time!"
Mi: "But then all the gore in that, you couldn't put into *Animal Crossing* for example. It wouldn't work." (FG 4)

Game Aesthetics and Mechanics

Specific game aesthetics and mechanics (e.g., good graphics, colour, movement) were also mentioned as being influential for game enjoyment. This was related to certain features which could enhance realism, which could influence feelings of enjoyment. One noteworthy finding was that effective graphics could promote enjoyment, even in instances where the actual gameplay was experienced negatively. This particular response, however, appeared to represent a divergent case which more accurately reflected one participant's own experiences rather than a consensus opinion.

Illustrative Quotations

"It's (*Killing Floor*) got a feature, it's really a new feature but it's a cool feature where if you get a head shot or something like that, it slows down time. It's quite amusing!" (Male, FG 4)

"I think a good game mechanic as well. Like, *Max Payne* with *Bullet Time*, you just enjoy it." (Male, FG 4)

"I love a new game with good graphics. My mate got *Far Cry 2*. I dislike the game immensely but I actually just spent half an hour just looking at the light........The graphics were amazing. I was just driving around going "oh wow, this shadowing is good!" So the game is bad but the graphics are so good." (Male, FG 3)

"Mirror's Edge is quite nice to look at; in this nice futuristic world where everything's brightly coloured and I really like that game and because it's a first-person view, it's quite immersive and fun." (Male, FG 4)

"The thing also about those games, is how immersive it is and they just used simple techniques like head-bopping or certain character movements and form actions.... *Far Cry 2* does it well. It's things like that, that help it to be more realistic and more enjoyable." (Male, FG 2)

Flow

The focus groups also discussed occasions where they had felt "drawn in" by games and the process of gaming. These processes in gaming were identified as important for the positive experiences which gaming could provide. Specific characteristics of these experiences include losing track of time, deep concentration and heightened enjoyment. In particular, positive, enjoyable experiences influenced gamers wanting to experience it again. Gamers also identified certain game aspects which they felt could facilitate perceptions of flow and immersion into the virtual world. These included: storyline and curiosity.

Illustrative Quotations

"Yeah, you really enjoyed it (gaming) once you got into it, just like, yeah that's quite fun and after a while you realise, where did the time go?" (Male, FG 2)

"You stop playing and you realise it's half three in the morning and you're like "oh I better go to bed now". (Male, FG 3)

"I've literally been there, half-asleep and hours of just walking through things and looking for special plants and stuff. Yeah, it's really just an engrossing game and by the time you reach the end of that, all you're looking forward to, is just to do it again..." (Male, FG 4)

"You do realise you're concentrating so much on a game you can't concentrate on anything else, then halfway through playing you realise you had other things on your mind that just came back and you just forgot about them for a while." (Male, FG 2)

"The game playing story just grabs you. I like a story behind a game when I'm playing it, so it's almost like a book or a film" (Male, FG 3)

"A good horror game as well was called *Dead Space*, where there's no pod for that, it's pure in games, it's a lot more immersive and it draws you in, especially when you know that's something is round the corner, when you can hear something and you know it's coming, and you're just waiting for it to happen." (Male, FG 4)

Relaxation/Stress-relief

Gamers also agreed that some games could be relaxing and an effective way of discharging negative feelings from everyday stresses. It was identified that being able to use violent actions in the virtual world could effectively alleviate frustration. Also, that game features, such as game soundtracks and pleasant visuals in games could enhance feelings of relaxation. It was also mentioned that the extent to which gaming could be relaxing was dependant on the specific game. For example; *Bioshock* was identified as being too intense to be relaxing.

Illustrative Quotations

"..sometimes games takes priority coz it's something to relax.....so games you can just chill out with." (Male, FG 2)

"It gives you a bit of escapism and if you're getting frustrated you can go and shoot people or beat on someone." (Male, FG 3)

Li: Can gaming be relaxing?
T: Yep

Ma: Yeah, *Flower* and *Flow*. *Flow* especially because I've nearly fallen asleep a couple of times because the PS3 drags you in and there's like ambient music in the background. The graphics are quite basic but the visual....

Mi: Yeah, black background and like neon.....

Ma: It quite relaxing. (FG 4)

"God games, for example are good way to relax/ relieve stress. You don't want playing games to feel like a job." (Male, FG 1)

"Quite often, it is just the graphical aspect or the art-style which will make or break the game just how relaxing a game can be." (Male, FG 4)

Frustration

Although gaming was generally experienced in a positive way, gamers said that sometimes they had negative experiences during gameplay. Feelings of frustration or annoyance were facilitated by two main game aspects; socialisation and challenge. These responses were relatively homogenious across all focus groups participants.

Social

It became apparent that gamers experienced feelings of annoyance and frustration during competitive play against friends, specifically in instances where friends were beating them. Further, other players being verbally abusive in online contexts could also result in frustrating gaming experiences. The social dynamics of others appeared to be influential to the nature of the gaming experience.

Illustrative Quotations

"I find if I fight against people, I get very annoyed at them, not the game." (Male, FG 2)

"When they (friends) do something wrong, you just can't deal with it and when they're on a different level, it just gets irritating." (Male, FG 3)

I: I've flexed a few controllers before when I've get really frustrated; that's usually with my mates. If I play with my mates and they're just pounding me....(Male, FG 3)

L: I don't think it's the game though; it's your friends you're annoyed with isn't it?

A: Yeah, usually.

I: It's not because he's gloating, it's just because he's beating me so much, and there's nothing I can do, it's on *Street Fighter* mainly.

L: One of my mates on *MBA*; it was the first time he'd ever played it and we couldn't beat him! (FG 3)

"With voice over IP, people talking to each other. Obviously it's made for people to talk about tactics, like how to work together. Obviously people don't use it for that and SPAM offensive words and that can really get you annoyed." (Male, FG 4)

"I was on *Left for Dead* recently and you just get some 13 year old American kid who just screams down the microphone and just joins the game to kill you and then leave...it's not fun when that happens..." (Male, FG 3)

"A bad online community definitely ruins a game. If you don't like the people that you play with online it ruins the whole point of it really. Sometimes that's half the game, or more." (Male, FG 2)

External social dynamics

One group of gamers discussed how the influence of external social dynamics could be frustrating in gaming. For example, other people in the room who were not directly involved in gameplay sometimes acted in ways which were frustrating, such as not understanding the rules of games or how important gaming was to players.

Illustrative Quotations

T: "It also depends on external situations. Going back a few years, when I was living with my parents, it's like if I'm playing a game, I have to put it down because my parents would be like "Do the washing up!!" That's more rage then, because I was in the middle of something and they don't understand the importance of it."

Ma: "Yeah, I think if you're sitting with someone who doesn't understand and you're dying quite a bit, and they're asking you why you're dying, and trying to give you tips..."

T: "That's so frustrating!"

Ma:" ...it's pretty frustrating!"

Mi: "Or they're like "can you pause it?" And you're like "It's an online game. You want me to *pause* the Internet for everybody?" (FG 4)

Too challenging

Frustration was also experienced if the level of the skills required in the game were too challenging. Being unable to achieve objectives or master the challenge of the game was felt to be detrimental to gaming experiences. Direct further support for the notion that the skill level was important for gaming experiences was provided.

Illustrative Quotations

"I'm playing *Call of Duty: World at War*. I'm trying to get through on Veteran, but not very well!....I just can't do it; it annoyed me!" (Male, FG 2)

"I got *Call of Duty 4,* and that last level when you're playing on Veteran; I just couldn't do it and I got really mad at that." (Male, FG 3)

"Ones that are for a challenge. I mean, they can be frustrating as well but it does depend on the degree of the challenge." (Male, FG 2)

" When you can't do something, you get really, really annoyed." (Male, FG 3)

6.3.3. Gaming Consequences

Consequences of playing videogames could be divided into three main categories: affective, psychological and social. Psychological consequences include a sense of accomplishment; affective consequences include positive affect; and social consequences include effective integration into daily life. Further themes included the fact that game consequences were largely dependent on variables such as the individual player and the success of the gameplay session. These themes will be discussed in further detail below.

Social: Integration into daily life

Gamers were generally effective in managing their time to fit gaming in their daily lives as work and other commitments took priority. There was agreement that gaming did not "get in the way" of everyday life and could, in some instances, be an effective way of integrating social interactions with others. Because participants were primarily recruited from games-related courses at university, there was agreement that gaming had a positive impact on their lives as their interest in games had led them to gaining

places in University. Had gaming not been a part of their lives, they agreed that they may not have gone to University.

Illustrative Quotations

" I can go days without playing a game if I've got enough to do, but if there's nothing too important to do then I'll play a game" (Male, FG 2)

" I think with lack of time we might have now in our third year, trying to finish a game...coz usually when I play a story-heavy game back at college or whatever, I could finish it in one sitting, and now you don't usually have the hours to finish it in one sitting nowadays. And it breaks the story away a bit." (Male, FG 4)

"I do play them *(games)* but ultimately, if I've got other things to do then I'll do them first but then I would be here if I didn't play games." (Male, FG 2)

"I don't think I do it *(play videogames)* if I've got work to do. I wouldn't do it to put off, or hinder myself work-wise. I usually only do it at night time or if I've got plenty of time during the day for uni and stuff." (Male, FG 3)

Le: Well, I've always wanted to make games since I started playing games. It's pretty much defined most of my life, because I've come to uni and done the course.....
D: That's the reason I chose that as well.
A: It probably varies from person to person, but I would safely say for us, it's definitely a big influence.
I: ....If I wasn't playing games, I wouldn't be at uni now." (FG 3)

Affective: Positive Mood

A divergent case was evidenced by one participant who reflected on his experiences of taking part in the experimental study of the researcher. He identified that through playing the game, he had felt more physiological aroused and it had had a positive influence on his mood. This suggests that the processes involved in playing videogames influences the affective outcomes of gameplay. There was also some agreement that playing games on a casual basis was associated with general mood and perceptions of life. Specifically, it was suggested that gaming influenced a more relaxed approach to life.

Illustrative Quotations

150

"Well I remember from the thing we did last year, when we played the game, my mood changed. I was really happy after that, because it was like early morning, so I'd just woken up and was quite unmotivated but when I'd finished playing, it was like "this is good", it woke me up I think." (Male, FG 2)

M: "I don't know if this is relevant or not, but I think games can make you a more likeable person. I think you have a broader sense of humour if you're a casual gamer. I don't know-it might be just me! "
Jo: "No, I agree with that, yeah!"
M: "You're just more relaxed aren't you about things. "
Jo: "Well maybe because you realise that not everything in life has to be serious."
M: "Yeah-there is a lighter side." (FG 2)

Psychological: Sense of accomplishment

A heightened sense of accomplishment was also mentioned as a positive consequence of playing videogames. This was derived from being able to "beat the game" and other players.

Illustrative Quotations

R: "I enjoy the challenge; a narrative-driven game especially because they give you different difficulty settings, I don't see the point playing it through on "easy". I mean you pay your money, £40 for an average title game and they say it's supposed to give you 40 hours worth of game-play, but if you play it through on easy, you don't get the elevation of finally beating a puzzle that the developers have spent hours putting together for you."

T: "Yeah, that sense of gratification of finally beating that boss that's kicked my arse about ten times." (FG 4)

Dependant on success of gameplay session

There was evidence that the outcomes of gaming sessions were related to the processes of gaming, particularly the degree of success. If the gaming session had been successful and players had performed well, this would lead to positive effects for feelings of accomplishment. In less successful instances, feelings of apathy could arise. The nature of these consequences could also be influenced by the amount of investment players have in a game. For example, if a player has invested a great amount of time in a game, this could lead both to positive consequences (e.g., enjoyment) but also negative consequences (e.g., anger) if things do not go the way a player intended.

151

"It depends on what I've been doing.....like if you've done something really well, you have a sense of achievement, a sense of accomplishment, but then if you've failed miserably at it, you'll just be like "I won't be playing that for a while." (Male, FG 2)

"I suppose it depends on how the gaming session has gone. Because I'm not usually one to rage but there's been times when I've very much felt like it; when things aren't going your way, it's more a ball-ache than it's worth sometimes. But then there's times when you've had a good session and you come out with a good haul on what you were doing and stuff and it's great I find." (Male, FG 4)

"But you can have fun if you finish on a high point of a game as well. I mean there's the accomplishment of your team winning like on a competitive playing game or once you've finished that game that you've been spending forty two hours playing, it can be a high point, but it can be a low point like "ah; what am I going to do now; there's no replay value left, and if there is, it's nothing I can go back to." (Male, FG 4)

"But then my mate plays it (*World of Warcraft)* and his mum knows his turns because he'll come downstairs, just screaming about how his Guild went somewhere and he'll be like "rraaahh!" But he can give you a run-by-run of the whole world because he's got a lot invested in it, like he finds it more enjoyable but if something goes wrong then it's a big thing for him." (Male, FG 3)

"Sometimes when it really got to me..it depends on that game and how much you've invested in the game because like with *WoW*-that game can take over your life." (Male, FG 3)

Dependant on the individual

Gamers' agreed that games themselves had minimal contribution on the negative consequences which are commonly reported rather, it is the player that is the key determinant of outcomes. Gamers agreed that games could only negatively affect people if those people were negatively predisposed.

Illustrative Quotations

"But then you do get those people that have no moral compass who will have a problem and go off and do it and it's just used as a scapegoat.....So it has a lot to with you as a person" (Male, FG 2)

"And there's this argument, "does this affect you or desensitise you?" but that's up to the person really. I mean if you can't tell the difference between virtual reality and reality then there's something wrong with you." (Male, FG 2)

"It takes a certain predisposition......And then if you're already a bit twisted...." (Male, FG 3)

"I think it's definitely the people who play them rather than the games themselves." (Male, FG 3)

" If like you're an addictive personality then it *(gaming)* can be something that you get addicted to but if you're not then it's up to you. If it wasn't that, it would be something else. So people do attach to it but it's one of those ones, where it's not necessarily the games; it's the people who are playing them." (Male, FG 3)

6.3.4. Attitudes

Game violence as distinct

Gamers' perceptions of violent game content were generally homogenous in viewing it differently to film violence due to differences in graphics. It was also commented that some violence in television was worse than violence in videogames. There was a general consensus that violent game content could not be taken seriously as it was so distinct from real life violence.

Illustrative Quotations

"A lot of movies are probably more violent than games because games are cartoony, sorta computer graphics; you can't really take them that seriously...even the realistic ones. So when you're talking about violence in games being popular, it's not the same way that violent movies are popular." (Male, FG 2)

"Manhunt 2 was a terrible game but the violence was more comical than anything else."(Male, FG 4)

"Well, that's similar to the bunch of people with that guy who said that *GTA* was a "murder simulator". It's absolute nonsense." (Male, FG 3)

"Thinking about that, you think back to *Skins,* for example, when one of the dude's sister gets drugged up, and then some other dude wants the brother to have sex with her or something like that. And obviously, he doesn't want to do it, but she'll overdose and die otherwise. But that's much worse than that comparatively in a game which...I mean no one was up in arms about that.." (Male, FG 4)

Game violence as a necessary by-product

A further common theme which emerged was the view that violence was often in games as a by-product of other factors, such as competition or achieving game objectives. This meant that gamers often did not interpret violence in a negative way, rather they saw it as a means to meet the game objectives, and often had no choice but to use violence to meet these objectives, particularly in heavily narrative-based games. Violence in games was also compared to violence in sports (e.g., rugby), and emphasised that it would not be equivalent if elements of violence were not present.

Illustrative Quotations

"I think it's a necessary by-product really because in game the key aspects of a game is you beating someone else and outside of sports, where you use a points system, the only way to beat someone else, is by you being there and them not." (Male, FG 3)

"Outside of sports, it's quite difficult to get a winner without any sort of violence." (Male, FG 3)

"Stuff that's competitive, there's always an element of violence in it I think....And like heavy contact sports like rugby or American football, it would be horrendous without violence!" (Male, FG 3)

"Violence is more like a by-product of competitiveness, more than something they put in the game as an entity, it's more the competitiveness that drives it."(Male, FG 3)

"It's one way of completing an objective, I mean sometimes you have to kill someone and you don't really think about doing it." (Male, FG 4)

" I mean, stuff that's competitive, there's always an element of violence in it I think. Like racing, the new *Need for Speed: Shift*; you get graded on whether you're a precise driver, whether you to the racing line and whether you avoid other cars or whether you're an aggressive driver and bang them out of the way to get past." (Male, FG 3)

Misconceptions in media and policy

Participants discussed the idea that there are often misconceptions in the media about the extent and level of violence in videogames. They agreed that the media tends to be selective in identifying games to represent concerns over violent content. They also felt that the media had little understanding of the games they reported, and tended to over-estimate the prevalence of severe violence in games.

"I think the way the media always picks out the wrong game as well. They want to talk about *Manhunt. Manhunt 2* was a terrible game but the violence was more comical than anything else. A few months before that a game called *The Darkness* came out, which was based on a comic book and that game was very, very violent and nobody even heard about that." (Male, FG 4)

" I watched Charlie Brooker, who did a one-off games special, and he was talking about...well he had a few clips of 1970s when he was talking about computers and stuff like that and games and how mindless violent they were. And they were like two pixel blobs. And then they had BBC News bulletins from like ages ago and there were like violent videogames depicted...oh have you ever played *Night Trap*?...... Anyway, it showed the way the BBC had reported on it, saying that the game depicted "mutilation of women" and the game had nothing to do with that!" (Male, FG 4)

"One of things which keeps annoying me in the media, is when they bring up say *Grand Theft Auto* and it's like "oh, this is a game where you're encouraged to kill prostitutes and run over old ladies and stuff." It's like, no, you get nothing in the game for doing that stuff. Just because it allows you to, it doesn't mean it's part of the game really. It's like, in real life, I could quite easily reach other and slap Mi in the face. If I did that, I would have to face the consequences of that." (Male, FG 4)

"*Fox News* in America, which is quite notorious for blowing things out of proportion, when a game called *Mass Effect* came out, I know at one point there's a sex scene and

you can either be a female or a male character. It's a female character you have sex with isn't it? Anyway, Fox News took the one shot, where you could see her bare ass and used it a million times and used it to say, this game is bad." (Male, FG 4)

Jo: "I do like *Swat 3* because it's one of those games where violence is used for good. It's quite a noble thing to be a police officer, isn't it?"
Ja: "Yeah, it's a last resort (*the violence*), you try and take them alive."
Jo: "It's one of those games that politicians don't mention." (Male, FG 2)

No adverse effects of violent videogame-play on real-life behaviour

All participants appeared to have strong views opposing the idea that playing videogames had negative consequences for real-life aggressive behaviour. Participants discussed the idea that engaging in violence in games was acceptable, but felt it was an activity which would not be transferred to real life. Furthermore, they identified that violent game content could potentially desensitise people in the virtual world, but not in the real world. They discussed the idea that behaviour in violent games is distinctly different from real life behaviour and that most "normal" people would actually be unable to undertake equivalent violent behaviour in real life. Gamers also discussed the idea that playing games might encourage people to form opinions, but these did not transfer into harmful behaviour.

Illustrative Quotations

"I think we've all been on several hundred killing sprees on *GTA (Grand Theft Auto)* but I don't think any of us would do it in real life or anything." (Male, FG 2)

"The violence in games is rather abstract. I mean in the game world it's acceptable but you wouldn't do that in real life."(Male, FG 4)

"I'm not going to go and car-jack a car and drive through Fishergate or something." (Male, FG 2)

"The majority of people play war games and they don't come out carrying World War Two guns and shooting people" (Male, FG 3)

"In real life, you don't go up to someone, press a button and perform an action on someone." (Male, FG 3)

"I'd lie if I said games don't have an affect on you at all. It's like reading a book; you'll gain opinions and stuff like that. After seeing a film or anything like that, like *Star Wars*, you'll come out going "zzoo zzoo zzoooo *(impression of Light Sabre)* after." (Male, FG 4)

T: "Yeah, when you play stuff like *Grand Theft Auto*, you will feel afterwards....I speak from personal experience, and I'm sure it will be the same for lots of people, and you walk down the street and you think "I could hi-jack that car; but I'm not going to!" You can tell the difference between reality and stuff like that."
R: "It's the 'if it was a videogame I would have stolen that car!'"
T: "Yeah, it's the "if" thing that the media seems to forget about a lot."
Ma: "I think they don't give people enough credit."
R: "Forget their conscious."
Ma: "I think people are moral enough to realise you don't steal cars or kill prostitutes and stuff like that." (FG 4)

"Most people, if they have had a decent enough up-bringing, there's kind of like a switch button in your head. It's like jumping from a height; a lot of people will say "yeah, I can jump off that!" but then as soon as they get to the top of the wall, the legs won't go. And I'm sure it's the same with "yeah; I could rob a car anytime!" and then you'll go up to a car and it'll be like "I'm not doing this!" (Male, FG 4)

"Penn and Teller who do a show called *BullSh*t* in America where they disprove certain things. One time was on violence in videogames and they had an average American kid, who played videogames all the time and they took him to a shooting range to shoot a gun, and you could tell he wasn't into it. And it showed a bit at the very end where they said they wouldn't show it where he cried because he's shot *one* bullet. You could tell he didn't like it at all, but he played videogames all the time. I think that one of those players who think they're "Top Dog" on the Internet, if they saw a dead body they wouldn't be able to take it..." (Male, FG 4)

A further issue which emerged was that participants perceived there to be distinctions between the way children and adults were affected by gaming. They perceived that because they were over the age of 18, they were not going to be negatively affected by playing violent videogames. However, they also felt that children could be more easily influenced, particularly if they had a history of violent behaviour. It was stressed, however, that the influences were largely dependent on the individual player, and that "normal" people were not usually influenced in a negative way.

Illustrative Quotations

"We're all over 18, it's not going to affect us." (Male, FG 2)

"If you've got kids who already have a history of violence and stuff in school then, they play a game then they might tend to take it out on people ..." (Male, FG 3)

"I mean, my brother is eleven, he plays *Grand Theft Auto 4* religiously, and he's not violent in the slightest, in fact the closest he got into a fight was defending his friend who was getting attacked by the year above him. He just pulled them off him; he didn't take a *Samurai* sword and cut their head off or something!" (Male, FG 3)

6.4. Discussion

Study 3 aimed to explore the diversity of motivations for playing videogames as no research to date has examined how they vary depending on the type of game or the individual player. It also aimed to provide a more detailed examination of gaming experiences, and how they are influenced by specific game characteristics. A further aim of Study 3 was to examine gamers' perceptions of the psychological, affective and social consequences of playing videogames. Finally, it aimed to address gamers' attitudes towards game violence and the claims of violent game content being linked with real-life violent behaviour.

The results suggested there are two distinct forms of gaming motivations; initial and enduring. Initial motivations were defined by their role in initialising gameplay, whereas enduring motivations were characterised by their ability to maintain gameplay engagement. Initial motivations were identified as playing videogames to escape, to alleviate boredom, to relax and for fantasy. This implies that gamers are motivated to play games as a distraction and an escape from real-world activities and as a way to occupy their time. Social, achievement and curiosity explained the motivations for continuing gameplay over time. These enduring motives are consistent with those found by Hsu et al. (2009), in a study exploring the variables related to the gaming experience and addiction of MMORPGs. Curiosity, sense of belonging, obligation and rewards were shown to significantly predict patterns of addiction in a sample of university students. These results provide initial evidence of

the variables which explain continued gaming motivation and potentially, gaming addiction.

Additionally, gaming motivations varied as a function of gamer mood, which suggests that engagement in gameplay follows similar patterns to other forms of media, as outlined by Mood Management Theory (Zillman, 1988a, 1988b, Zillman & Bryant, 1985). This suggests that the type of game which is played is largely dependent on how the player is feeling. This could include games which can reduce stress and boredom, as a means of alleviating negative mood, or could include other games which can provide thrills and exhilaration, as a means of enhancing arousal. This suggests there to be a variability of gaming outcomes which occur as a result of both individual gamer motivation and the type of game played. Existing theoretical models (e.g., GAM) which examine the influence of violent videogame exposure on aggression-related outcomes remain too restrictive in accommodating the influence of these motivational variations across and within individuals. Given these observations, further consideration of the implications of the Mood Management framework for understanding the diversity of gaming motivations is required. This evidence suggests that previous gaming motivation models, which identify categories of gamers are too restrictive in accommodating the diversities within individuals on their motivations for playing different games. Future models should therefore include general motivational themes (e.g., boredom reduction, need for achievement) for different types of games rather than using gamer categories to predict game usage.

In relation to social gaming experiences, this study found that feelings of social connectedness and social belonging were related to continued periods of gameplay, with team dedication resulting in the desire to maintain gaming sessions to remain in the online community. This is further supported by research showing that sense of belonging is positively associated with time spent participating in online activities (Roberts, 1998), and with online community loyalty (Kim, Lee & Hiemstra, 2004). These findings also support those of Williams et al. (2008) that the sociability of games was positively associated with playing time. This finding is particularly noteworthy in reference to previous research examining excessive gaming and gaming addiction (Grűsser et al., 2007), although this research did not identify the specific gameplay factors which may facilitate excessive play. The study also found that social

factors associated with team dedication keep gamers playing. This implies a distinction between prolonged engagement in specific gaming sessions and the concept of "addiction" which other researchers have examined (Griffiths, 2007). This distinction should be considered in future research examining the influence of specific aspects of gaming experiences on time spent engaged in the activity. The findings from the current study provide new evidence of the factors which both initialise and maintain periods of gameplay, and imply that future research should consider the distinctions between these two forms of motivation. This would provide a greater understanding of the specific game aspects which are influential on gaming motivations, and provide evidence of variables which can explain prolonged periods of gameplay, an issue identified as a concern by a number of researchers (e.g., Griffiths, 2008; Grűsser et al., 2007). Furthermore, participants believed that engagement in gaming did not appear to have detrimental social consequences (e.g., impacts on daily life) as they implied that they were able to manage their time effectively and managed gaming around other daily life commitments (e.g., assignments, work). This suggests that gaming habits follow equivalent patterns to other leisure activities, and that gamers do not appear to show signs of gaming addiction as suggested by previous researchers. This distinction between studies could be attributed to the fact that the current study recruited gamers from University Games courses, and that these participants may utilise better self-discipline and time-management strategies than non-university samples in other studies. Regardless of this limitation, the current study's findings suggest that not all gamers play excessively and suffer social detriments as a consequence. This can therefore be presented as an insight into the gaming habits of a specific demographic group of gamers, contributing new evidence to the literature. This, however, does not suggest that all gamers follow equivalent patterns of play, rather, that the results are representative of more academically-orientated gamers.

The current findings revealed strong evidence of positive gaming experiences, particularly enjoyment, flow, relaxation, and escapism. Negative experiences of frustration were also reported. The findings also suggest that specific game aspects are important for gaming experiences. Background music, for example, was identified as influencing relaxing gaming experiences. This is partially consistent with previous findings which have shown that music in games can reduce tension and negative

affect (Grimshaw, Lindley & Nacke, 2008). Although these influences are largely dependent on the specific game, it is important to note that very little research to date has identified the way in which specific game aspects are associated with gaming experiences. Although Wood, Griffiths, Chappell and Davies (2004) provided initial evidence of the importance of specific structural game characteristics, they did not examine the way in which these influence gaming experiences. Other research has shown that competition, suspense in storyline, and lighting are influential for gaming experiences (Klimmt et al., 2009; Knez & Niedenthal, 2008; Vorderer, Hartmann & Klimmt, 2003). These studies, however were conducted within experimental settings and/or with non-gamer samples, limiting the generalisability of the findings. The current research investigates the influence of the constituent components of games on the way samples of regular gamers experience them.

Gamers reported that violent content in games enhanced game enjoyment. This was shown to derive from the fact that gamers could engage in violent and/or illegal acts which cannot normally be undertaken in real-life. This suggests that violence in games is a useful mechanism for gamers to perform socially unacceptable acts in a setting with no real-life adverse consequences. This finding is consistent with Bertozzi (2008) who acknowledges the potential positive experiences associated with engagement in violent gameplay as an opportunity to violate social norms. The finding that game violence is enjoyable is also noteworthy since it contradicts the findings of Pzybylski et al., (2009) who showed that violence in games did not result in enhanced enjoyment. The current research, however, examined the attitudes of regular gamers whereas Pzybylski et al. (2009) used undergraduate students within a lab setting. It is conceivable that distinctions in sample type could explain the contradictory findings as Glock and Kneer (2009) point out that there are differences in the way gamers and non-gamers conceptualise the influences of playing violent videogames. This has implications for sampling in future experimental studies on gaming, and the limitations of using non-gamers as representative of the attitudes, experiences and behaviours of gamers. Further, the current finding that violent game content enhanced game enjoyment is inconsistent with the findings of Study 2 which found that level of violence had no effect on measures of the game experience. This could be due to the fact that Study 2 measured flow which may manifest itself differently from enjoyment. Alternatively, it is possible that participants between

161

conditions in Study 2 experienced equivalent positive gaming experiences as a product of the level of violence being appropriate for the type of games used.

Social experiences were also found to be influential for game enjoyment through social interactions and networking, consistent with previous research by Cole and Griffiths (2007). Their study specifically focused on playing online games, whilst the current study explored social interactions in both online and offline gaming contexts. This comparative approach can provide a more detailed examination of the potential positive experiences derived through a range of different social gaming contexts. It would be useful for further research to compare the differences in gaming experiences, the associated outcomes between online and offline contexts, and the role of social influences (e.g., competitiveness) on potential effects. In addition, the influence of competitiveness in gaming also requires further examination given the current research findings showing that heightened competition against others can result in frustration, although competitive gameplay also provides enjoyable gaming experiences. It remains unclear how this interacts with gaming experiences in different social gaming contexts (i.e., online versus offline), and the nature of the continuum on which competitiveness operates. A question remains over what constitutes enjoyable competition and at what point it becomes frustrating. Very little research has examined the social contexts of gaming, and given the popularity of social gaming for an increasing range of individuals, this is an area which requires greater theoretical and empirical attention. The results of this study suggest the need for a greater acknowledgement of social gaming contexts, particularly how frustration is influenced by social competition and poor social dynamics with other players. This clearly demonstrates that gaming experiences can be influenced by specific game aspects and social contexts. To address these questions, future research should ask gamers to provide accounts of gaming experiences for both online and offline contexts, and describe the nature of competition between players.

The focus group analysis suggests that the psychological and affective consequences of playing videogames are determined by variables such as success in individual gaming sessions and the time investment in the game. Furthermore it was found that gamers believed that the consequences of gaming were due to the person playing rather than a product of the games. This finding is supported by Markey and Markey

(2010) who suggest that although playing violent videogames can increase aggression, this is only the case for people who are already predisposed to violence. They further argue that these effects are minimal for individuals without this predisposition. These issues suggest that people experience games in different ways, and demonstrates the dynamic nature of gaming experiences and associated outcomes. This challenges the assumptions of the General Aggression Model that all people are affected by games in the same way and suggests that the framework is too restrictive to account for individual characteristics, preferences and contexts.

Participants expressed strong views against the claim that violent videogames influenced aggressive and violent behaviour. The importance of violent game content was discussed in reference to specific types of games, and was not perceived to be appropriate or important for all gaming experiences (e.g., extreme violence in *Mario Karts* would be inappropriate, whereas it was necessary in *Gears of War*). Violent game content was also discussed in reference to the idea that it is often incorporated in games as a by-product of competitiveness. That is, the only way to be successful in games is for the player to be alive or be a winner, and someone else is not. This meant that gamers often do not interpret violence in a negative way rather, they see it as an alternative means to an end goal, and sometimes as the only means of achieving game objectives.

Participants felt that most gamers had clear perceptions of the distinctions between virtual and real life violence, and that their violent game behaviour does not transfer to real life violence. Gamers felt that violent game content was too abstract to be "taken seriously", and that the processes of performing violent acts in games (e.g., pressing a button) was by no means representative of real-life actions. This finding is consistent with Whitty et al. (2011) who found that MMORPG players reported clear distinctions between the game world and real life. Furthermore, it was suggested that playing violent videogames could promote the formation of attitudes or opinions but these did not necessarily transfer into detrimental real life behaviour. This finding is consistent with those of Ferguson (2007a). This has implications for existing research evidence on the links between exposure to violent game content and aggression attitudes and behaviour. The current findings suggest that these gamers view a potential link between game violence and the formation of aggressive attitudes, but

not behaviour. This suggests examining aggressive cognition, rather than extending to behaviour, is most relevant for future experimental gaming research. Research which intends to examine the links between violent game content and aggressive behaviour should acknowledge the complexities and range of influences for these actions (e.g., peer violence, culture, history of violence, crime), which cannot be examined within the constraints of the laboratory. Research of this nature should be examined either through cross-sectional or longitudinal methods.

Gamers also identified misconceptions within media and public perspectives on the levels and types of violence in games. The fact that the media generally was seen as being uninformed of the content of games, and was selective when choosing videogames to represent concerns over violence, resulted in participants feeling that games often received a "bad press". This suggests there may be clear distinctions between the actual content of games and the perceptions of content of the media and the public. These findings match the concerns of Ferguson (2010) who refers to the misinformation in the media of the violent content in the game *Mass Effect.* Misinformation in this case can enhance a sense of moral panic, and is neither helpful nor informative of the true prevalence of violence in games. It is necessary therefore to consult game experts rather than relying on media coverage to understand the extent and level of violence in games.

A limitation of the current study is that no causation can be inferred from qualitative research. Despite the fact that qualitative methodology provides rich data from which divergent themes can emerge, these methods cannot provide rigour between variables, or ensure control of extraneous factors. These issues should be acknowledged when considering the current findings. These issues aside, the methodological approach of the current study was most relevant given the nature of the research questions, and the idiographic and subjective nature of gaming experiences. This could provide evidence of gamers' interpretations of the meanings they derive through gaming, which would not otherwise be accessible though other methodological approaches.

Summary
The study provides new evidence of the diversity of motivations for playing videogames, and suggests the need to reconsider the way in which motivations can be

studied empirically. This is particularly relevant given the fact that gaming motivations are vary by both individual gamers and game genre. The results also suggest largely positive consequences of gaming, although it highlights that negative consequences are often a result of dispositional traits of individual players rather than because of gaming or the games themselves. The nature of gaming outcomes can also be a result of the success of the gaming session, suggesting the importance of examining gaming processes and experiences rather than focusing too closely simply on the effects. This study also found evidence of both positive and negative gaming experiences, and that these are influenced by specific game aspects. This implies that a greater focus on game-specific research is required to further examine the relationship between specific game components, gaming contexts and player experiences. The personal nature of gaming suggests the value of using an idiographic approach to capture the dynamic relationships between these influences. Social aspects of gameplay are particularly influential for both game enjoyment and frustration, suggesting that they can "make or break" the gaming experience. This contributes new empirical accounts, and suggests further research should examine social contexts and experiences of gaming to provide a better understanding of the associated affective outcomes of playing videogames with others.

CHAPTER 7: STUDY 4

7.1. Introduction

Playing games socially with others (e.g., cooperatively or competitively), both in online and offline contexts, is appealing to gamers as it can facilitate opportunities for social interaction, and enhance feelings of social belonging and connectedness with friends (Griffiths, 1997a). Playing games socially is becoming increasingly popular. Recent figures show that 64% of gamers play with others gamers in person (ESA, 2010). Furthermore, the recent development of social games (e.g., *Farmville, Cafe World)* is resulting in gaming becoming more appealing to a broader demographic group, and recent figures show that 55% of social gamers are female (ISG, 2010). This suggests the need to examine the social dimensions of gaming, as there is evidence that these considerations provide an important motivation for engaging in the activity.

The importance of considering social gaming factors is highlighted by evidence that playing games with others can enhance gaming experiences (Gajadhar, de Kort & IJsselsteijn., 2008, 2009; Madryk Inkpen & Calvert, 2006; Ravaja et al., 2006). This includes enhancing arousal, positive affect and engagement (Mandryk et al., 2006; Ravaja et al., 2006). Gajadhar et al. (2008) examined the influence of social setting on player experience (e.g., social presence, positive affect, hostility). They found a linear increase in participants' feelings of social presence from playing against a computer, to playing online with another person, to playing in the presence of other players. This suggests that the opportunities for social interaction and shared experiences, along with the co-presence of other players can enhance the enjoyment of gaming.

This is consistent with research examining aspects of social gameplay which has typically compared the differential effects of playing against computers or other players (Easton, 2006; Lim & Lee, 2009; Lim & Reeves, 2010; Williams & Clippinger, 2002). Higher physiological arousal, presence, flow and enjoyment have been found when playing against other players than a computer (Guadagno, Blascovich, Bailenson, McCall, 2007; Mandryk, Inkpen & Calvert, 2006; Ravaja et al., 2006; Weibel et al., 2008). The consistency in these findings suggests that social gameplay influences gaming experiences and associated outcomes, and therefore

requires greater empirical investigation. This is particularly relevant given recent findings suggesting that playing in larger groups results in higher state hostility following gameplay than playing in smaller groups (Eastin, 2007).

Additionally, other research has examined the influence of social setting in relation to game involvement (Gajadhar et al., 2009). This research examined the differences in experiences of game involvement between conditions of solo and social play. The authors found no differences in players' levels of involvement, regardless of whether they were playing alone or were co-located with others. This suggests that playing with others has little effect on the way players interact with games.

Although the studies outlined above provide initial evidence of experiences associated with both solo and social gaming experiences and the influence of social groups, these issues have not been examined in real-life gaming contexts. Study 4 aimed to examine differences in self-reported subjective flow between solo and social gaming experiences. To date, it is unclear whether social gaming contexts facilitate flow experiences. Csikszentmihalyi proposed the concept of "group flow" which includes characteristics of group work which can help individual group members achieve flow (e.g., parallel, organised work and target group focus). Sato's (1988) research on motorcycle gangs suggests that in addition to the established flow components outlined by Csikszentmihalyi (1975), the sense of "being seen" and "showing off" are apparent in group contexts, and enhance the enjoyment and intrinsic rewards from the activity. This is said to be promoted through feelings of social belonging and companionship with others (Sato, 1988). In applying these principles to the context of social gaming, it seems reasonable to assume that similar experiences will be facilitated, as this activity provides opportunities for friends to play together, and often incorporates aspects of cooperative play and collaborative tasks to achieve group goals. Competitiveness in gaming and leader-boards can also allow players to "show off" their competence to fellow gamers, which can promote enjoyment and rewards from engaging in social gaming.

Study 4 also examined the influence of flow on post-gameplay mood, and compare this between solo and social gaming experiences as this has not been previously addressed. Study 3 demonstrated that social interactions between players influences

the nature of the gaming experience. Although there was evidence that good social dynamics facilitated enjoyable gaming experiences and poor dynamics were frustrating, it was not established whether these experiences translated into differential outcomes. In addition, it remains unclear whether flow experiences and the associated affective outcomes are equivalent between solo and social gaming experiences. Preliminary experimental findings by Gajadhar, de Kort and Ijsselsteijn (2008), however, have shown higher positive mood following gameplay in the presence of another player than in conditions of online gameplay or playing against computer-controlled agents. This suggests a positive influence of social variables on gaming outcomes, but does not examine the way in which gaming processes and experiences are associated with these outcomes.

Cooperative play is one type of social gameplay which is often central in online contexts where teamwork is essential for achieving game objectives. Research has shown cooperation and teamwork to be crucial elements of online gaming experiences (Frostling-Henningsson, 2009). Cooperation in gaming can also be present in "offline" multiplayer contexts where gamers work together to achieve a common goal. For example, *Halo 3* incorporates a multiplayer option to undertake objectives and missions, such as destroying the "Scarab tank" and "Flood". For online contexts, the role of community and clans in gameplay can determine positive gaming experiences. Empirical evidence suggests that the cooperative and social values of online communities constitute key motivations for gameplay (Griffiths et al., 2004a; Chappell et al., 2006).

Competitive play is another type of social gameplay which motivates gamers to engage in the activity. Jansz and Tanis (2007) explored the motivations of online players of First Person Shooter (FPS) games, and found that competition in online "clans" was a key variable in determining motivation and enjoyment. Competitive gameplay can take place in both online and offline contexts. Online competition can take place between two or more players at one time for MMORPGs. Multiplayer and competitive aspects of offline contexts can also allow numerous players to play against each other at one time. For example, the *Forza Motor Sport* series allows players to race competitively against each other for victory.

Competition in gaming has been studied recently in relation to its influence on aggressive affect, thoughts and behaviour (Anderson & Carnagey, 2009). Their fndings showed that the level of competitiveness in games had no significant influence on measures of aggression following gameplay whereas violent content did show an effect. This finding cannot be generalised to the effects of social contexts of competitiveness on outcomes, since it was limited to studying the effects of competitive game characteristics in sports videogames within a laboratory setting. There is a need for further research to examine the effects of competitiveness across a range of game genres and social contexts. Although this study offers a starting point for considering the role of competitiveness in gaming and its potential consequences, it does not directly examine the social processes involved in competitive play and how these facilitate perceptions of game enjoyment and affective outcomes. Additionally, because of the contradictory findings from Study 3 on the role of competitiveness influencing both positive and negative social gaming experiences, and the lack of experimental evidence from Study 2 on the influence of aggressive personality, Study 4 examined the associations between competitiveness, aggression, flow experiences and outcomes for mood. This was examined to assess whether the level of trait competitiveness and aggression were associated with positive gaming experiences and outcomes.

Other research has compared competitive and cooperative gameplay tasks to examine their influence on physiological and aggressive outcomes (Anderson & Morrow, 1995; Eastin, 2007; Lim & Reeves, 2010). Based on Deutsch's (1993) theory of competition effects, Anderson and Morrow (1995) examined the influence of competitive compared with cooperative game instructions on aggressive behaviour within gameplay. Frequencies of aggressive and non-aggressive play style towards other game characters were obtained by observing participants' gameplay. Findings indicated that there was a significantly higher proportion of aggressive gameplay behaviour in the competitive game condition than cooperative one. Additionally, research by Lim and Reeves (2010) showed that competitive gaming tasks induced higher physiological arousal in players compared to cooperative ones. This study, however, only provides evidence of physiological outcomes and cannot relate these to specific characteristics of gameplay experiences. For example, it cannot be

established whether higher physiological arousal for competitive than cooperative types of gameplay leads to a more enjoyable gaming experience. No published research to date has examined this issue, or identified the subjective experiences of real-life gaming contexts. Study 4 aimed to address this limitation by comparing self-reported flow experiences between competitive and cooperative gaming conditions. As no research to date has systematically compared the differences between online and offline social experiences, the current study also compared self-reported flow and post-gameplay mood between online and offline gaming contexts.

In summary, Study 4 compared flow and post-gameplay mood between gamers' solo and social gaming experiences. Secondly, it examined the differences in flow and mood between gaming contexts (online versus offline) and types of gameplay (competitive versus cooperative). Finally, it examined the relationships between trait competitiveness, aggression, flow and post-gameplay mood in social gaming experiences. Trait aggression was included as a means of extending the findings from Study 2, to real-life contexts.

The objectives of the study were:

1. To examine the extent to which flow experiences and mood outcomes differ between the following:
    a. Solo and social gaming contexts.
    b. Online and offline social gaming contexts.
    c. Competitive and cooperative social gaming contexts
2. To examine the potential influence of trait aggression and trait competitiveness on (positive and negative) mood outcomes in both solo and social gaming contexts.

This was achieved by asking gamers to consider a recent solo and social gaming experience and to complete an online questionnaire measuring flow, positive affect, negative affect and trait aggression and competitiveness. Participants were asked to indicate the type of gameplay and context in which they had played for the social experience.

170

7.2. Method

7.2.1. Design

A mixed design was used. The first aspect of the study used a within-participants design in which measures of flow and affect were taken for both solo and social gaming experiences for all participants. Measures of trait competitiveness, aggression, and affect were also taken. The second aspect of the study was a between-subjects design in which flow and mood in social gaming experiences were compared between online and offline contexts, and between cooperative and competitive gameplay types. (For a full copy of the questionnaire, please refer to Appendix 7).

7.2.2. Participants

Participants were regular gamers (*N*=302), recruited from Computer Game Development and Game Design degree programmes at Universities in the UK. Participants were also targeted through advertising the online questionnaire on numerous gaming forums and discussion boards.

7.2.3. Materials

Background Questionnaire

The Background Questionnaire included items of demographic information, gaming habits (e.g., how often participants played games, hours per week spent gaming), gaming preferences (gaming contexts, consoles and genres), and the importance of different gaming motivations.

The *Flow State Scale-2* (Jackson & Eklund, 2002; Jackson & March, 1996) and the *Positive and Negative Affect Schedule* (Watson et al., 1988) were used as described in Study 2. The *Buss-Perry Aggression Questionnaire* (Buss & Perry, 1992) was also used in the same way as described in Study 2, except that a 5-point scale was used (1 = not at all characteristic of me, 5 = extremely characteristic of me), instead of a 7-point scale as used in Study 2. This was to draw comparisons between aggression scores with other samples from previous research which has used a 5-point scale for this measure (Buss & Perry, 1992; O'Connor, Archer & Wu, 2001).

All the measures were found to be adequately reliable. The *Flow State Scale-2* was calculated as having a Cronbach's alpha of .87 in solo gaming contexts, and .89 in

social ones. In solo gaming contexts, the *PANAS* was calculated as .89 for positive affect and .81 negative affect. In social gaming contexts, the *PANAS* was .90 for positive affect and .86 for negative affect. The *BPAQ* was calculated as having an overall alpha coefficient of .91. The subscales were calculated as .83 for physical aggression, .80 for verbal aggression, .84 for anger, and .86 for hostility.

Revised Competitiveness Index (CI-R; Houston, Harris, McIntire & Francis, 2002)

The Revised Competitive Index was used as a measure of interpersonal competitiveness. Participants were asked to rate, on a 5-point scale (1 = strongly disagree, 5 = strongly agree) the extent to which they agreed with a series of 14 statements. Examples of items included; "I enjoy competing against an opponent". A mean score for trait competitiveness was calculated for use in subsequent analyses.

Research has shown the CI-R to be high in internal consistency (α = .87), and to consist of two stable factors which can be used to create two sub-scales of enjoyment of competition and contentiousness (e.g., "I will do almost anything to avoid an argument"). The CI-R has also been shown to be significantly correlated with other measures of competitiveness (e.g., the Sport Orientation Questionnaire Competitiveness Subscale) (Houston et al., 2002).The current study calculated an alpha coefficient of .89 for the measure.

7.2.4. Procedure

The web-link to the online questionnaire was advertised on numerous gaming forums and discussion boards. Participants were asked to consider both a solo and social gaming experience on which they could provide a retrospective account of the experiences of flow as well as their positive and negative feelings following the gameplay experience.

7.3. Results

7.3.1. Descriptive analyses

Based on the responses provided in the Background Questionnaire, the demographic information was collated for gender, age, gaming habits and preferences. Table 20 below presents the percentages and number of participants for the demographic variables. Table 21 reveals that the majority of participants were male (79.80%), aged

18-25 years (62.67%), and played videogames regularly (57.28%). Descriptive analysis was also conducted on the frequency of play in gaming contexts. Playing solo was the most frequent context in which games were played (M = 4.22, SD = .93), and playing offline competitively was least frequent (M = 2.60, SD = 1.23).

Table 21: Frequency analysis of the demographics and gaming habits of the sample

Demographic		*N*	*%*
Gender	Male	241	79.80%
	Female	61	20.20%
Age	< 18 years	5	1.67%
	18-25 years	188	62.67%
	26-40 years	99	33.00%
	41-50 years	7	2.33%
	51-60 years	1	0.33%
How often	Regularly	173	57.28%
	Most of the time	81	26.82%
	Occasionally	44	14.57%
	Very rarely	4	1.32%
Hours per week	< 1 hour	8	2.65%
	1-5 hours	41	13.58%
	6-10 hours	64	21.19%
	11-15 hours	54	17.88%
	16-20 hours	60	19.87%
	21-25 hours	19	6.29%
	26-30 hours	19	6.29%
	30+ hours	37	12.25%
Preferred Console	XBox 360	116	38.41%
	PC	89	29.47%
	Sony PS3	65	21.52%

Nintendo Wii	11	3.64%	
Sony PS2	9	2.98%	
Nintendo DS	6	1.99%	
Other	3	0.99%	
Nintendo GameCube	2	0.66%	
Xbox	1	0.33%	

Competitiveness and trait aggression

Descriptive analyses were conducted on competitiveness scores, aggression scores, including the four sub-scales of the BPAQ (see Table 22 below).

Table 22: Descriptive analysis of competitiveness, trait aggression and the four aggression sub-scales

Measure	Mean	SD	Min	Max
Trait Aggression	64.76	18.33	34.00	125.00
Physical Aggression	19.20	6.87	9.00	45.00
Verbal Aggression	13.79	4.24	5.00	25.00
Anger	14.17	5.67	7.00	35.00
Hostility	17.51	7.22	8.00	40.00
Competitiveness	48.72	10.15	20.00	70.00

Flow

Descriptive analysis was conducted on the nine flow dimensions, including mean flow scores for all participants (see Table 23 below). Mean flow scores were calculated as 3.81 (SD = .41) for solo and as 3.78 (SD = .46) for social gaming experiences. These scores were used for subsequent analyses.

To ensure consistency with previous theoretical assumptions on the occurrence of flow (Massimini & Carli, 1988), correlations were conducted between the sub-scales of "balance of skills and challenges" and "autotelic experience" for solo and social gaming experiences. The results showed that there was a significant positive correlation between them for both solo (r = .50, $p < .001$) and social gaming experiences (r = .34, $p < .001$). This indicates that an equal balance between the

challenge of the game and gamers' skills was positively associated with the overall flow derived from the activity. This further suggests that flow was experienced in gaming, as flow theory assumes that the condition of a skill-challenge balance facilitates feelings of enjoyment.

Table 23: Descriptive analysis of flow items for solo and social gaming experiences

Dimension	*Solo*		*Social*	
	M	*SD*	*M*	*SD*
Skill-challenge balance	4.02	.52	3.86	.55
Mergence of action and awareness	3.80	.58	3.80	.58
Clear goals	3.87	.56	3.88	.61
Unambiguous feedback	3.92	.55	4.00	.54
Deep concentration	3.57	.66	3.54	.69
Sense of control	3.98	.61	4.11	.66
Lack of self-consciousness	4.00	.58	3.81	.67
Distorted sense of time	3.76	.61	3.75	.50
Overall autotelic experience	3.82	.65	3.91	.59
Mean Flow	**3.81**	**.41**	**3.78**	**.46**

Affect

Descriptive statistics were calculated for post-gameplay positive and negative affect for solo and social gaming experiences for all participants (see Table 24 below).

Table 24: Descriptive analyses for flow and post-gameplay mood for solo and social gaming experiences

Measure	*Solo Experience*		*Social Experience*	
	M	**SD**	**M**	**SD**
Flow	3.81	.41	3.78	.46
Positive Affect	3.39*	.84	3.47*	.92
Negative Affect	1.39	.51	1.41	.59

$*p < .05$

Within-subjects comparison

175

Repeated measures t-tests were conducted to examine the differences between solo and social gaming experiences on flow and post-gameplay affect (see Table 24 above). Social gaming experiences provided greater perceptions of positive affect following gameplay than solo experiences (t (259) = 2.16, *p* < .05). However, there were no significant differences in experiences of flow between solo and social experiences (t (191) = 1.64, *p* = .10), or for negative affect following gameplay between the two experiences (t (249) = .70, *p* = .48).

To examine whether there were differences in experiences of flow and post-gameplay affect measures between different types of social play (cooperative versus competitive) and of social game context (online versus offline), further descriptive and inferential analyses were conducted on participants' social gaming experience responses. Table 25 below presents the means and standard deviations for flow and affect between game context and gameplay type.

Table 25: Descriptive analyses of flow and post-gameplay mood by type of gameplay and contexts for social gaming experiences.

Measure	*Type of gameplay*				*Gaming context*			
	Cooperative		*Competitive*		*Online*		*Offline*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Flow	3.71	41	3.82	.48	3.74	.45	3.78	.47
Positive Affect	3.39	.83	3.52	.93	3.47	.95	3.39	.86
Negative Affect	1.30	.43	1.48	.69	1.43	.62	1.30	.46

There were no significant differences in flow scores (t (137) = 1.46, *p* = .15), post-gameplay positive affect (t (157) = .92, *p* = .36) or negative affect (t (129.17) = 1.89, *p* = .06) between competitive and cooperative gameplay. Similarly, there were no significant differences in flow scores (t (156) = .54, *p* = .59), post-game play positive affect (t (189) = .56, *p* = .58), or negative affect (t (177) = 1.52, *p* = .13) between online and offline gaming contexts.

Solo gaming experiences

Zero-order correlations

Zero-order correlations were conducted to explore the relationships between the predictor variables of flow, trait aggression and competitiveness, and the criterion variables of post-gameplay positive and negative affect, in solo gaming contexts (Table 26 below). The correlation coefficients between each of the predictor variables were lower than .70, indicating little multicollinearity, and suggested inclusion of these variables in the regression model (Tabachnick & Fidell, 1996). Positive affect was positively correlated with flow (r = .52, p < .01), and competitiveness (r = .11, p < .05). Negative affect was positively correlated with flow (r = .15, p < .05) and trait aggression (r = .34, p < .01).

Table 26: Zero-order correlations of the predictor and criterion variables

	2	*3*	*4*	*5*
1. Positive affect	.29**	52**	. 05	.11*
2. Negative affect		.15*	.34**	-.06
3. Flow			.01	.04
4. Trait aggression				.20**
5. Competitiveness				

** p < .01   * p < .05

Multiple regression

Table 267and 28 present the beta values, coefficients, standard errors and significance level for the predictors on the affect measures. Flow in gameplay significantly predicted post-gameplay positive affect in solo gaming experiences (β = .51, t = 8.78, p < .001). The adjusted R^2 value indicates that 27% of the variance in positive affect can be accounted for by flow.

Table 27: Regression of flow, aggression and competitiveness on post-gameplay positive affect in solo gaming experiences

Predictors	B	*SE* B	B	*P*
Aggression	.001	.003	.03	.67
Flow	1.06	.12	.51	<.001**

Competitiveness	.01	.01	.08	.17

Note: R^2 = .28   Adjusted R^2 = .27   *p < .05   **p < .001

Table 28 below shows that trait aggression (β = .37, t = 5.75, p < .001), and trait competitiveness (β = -.14, t = -2.21, p < .05), significantly predicted post-gameplay negative affect in solo gaming experiences Specifically, those high in trait aggression experience greater negative affect after gameplay. Competitiveness was a negative predictor, indicating that those gamers low in competitiveness experience higher negative mood after playing. The adjusted R^2 value indicates that 15% of the variance in negative affect can be accounted for by the predictors.

Table 28: Regression of flow, aggression and competitiveness on post-gameplay negative affect in solo gaming experiences

Predictors	**B**	*SE* **B**	**B**	**P**
Aggression	.01	.002	.37	<.001**
Flow	.19	.08	.15	.02*
Competitiveness	-.01	.003	-.14	.03*

Note: R^2 = .16   Adjusted R^2 = .15   *p < .05   **p < .001

Social gaming experiences

Zero-order correlations

Zero-order correlations were conducted to explore the relationships between the predictor variables of flow, trait aggression and competitiveness, and the criterion variables of post-gameplay positive and negative affect in social gaming contexts (Table 29 below). The correlation coefficients between each of the predictor variables were lower than .70, indicating no multicollinearity, and suggested inclusion of these variables in the regression model (Tabachnick & Fidell, 1996). Positive affect was positively correlated with flow (r = .48, p < .01) and competitiveness (r = .16, p < .01). Negative affect was positively correlated with trait aggression (r = .37, p < .01).

Table 29: Zero-order correlations of the predictor and criterion variables

	2	*3*	*4*	*5*
1. **Positive affect**	.21**	.48**	.05	.16**
2. **Negative affect**		-.04	.37**	-.05
3. **Flow**			-.02	.18**
4. **Trait aggression**				.20**
5. **Competitiveness**				

$** \ p < .01$

Multiple regression

Table 30 below shows that flow in gameplay significantly predicted post-gameplay positive affect in social gaming experiences ($\beta = .47$, t = 7.47, $p < .001$). The adjusted R^2 value indicates that 23% of the variance in positive affect can be accounted for by flow.

Table 30: Regression of flow, aggression and competitiveness on post-gameplay positive affect in social gaming experiences

Predictors	**B**	*SE* **B**	**B**	**P**
Aggression	.002	.003	.05	.45
Flow	.94	.13	.47	<.001**
Competitiveness	.01	.01	.06	.34

Note: $R^2 = .24$ Adjusted $R^2 = .23$ $*p < .05$ $**p < .001$

Table 31 below shows that trait aggression significantly predicted post-gameplay negative affect in social gaming experiences ($\beta = .39$, t = 5.84, $p < .001$).The adjusted R^2 value indicates that 14% of the variance in negative affect can be accounted for by the predictors

Table 31: Regression of flow, aggression and competitiveness on post-gameplay negative affect in social gaming experiences

Predictors	B	*SE* B	B	P
Aggression	.01	.002	.39	<.001**
Flow	-.02	.09	-.02	.82
Competitiveness	-.01	.004	-.13	.06

Note: R^2= .15   Adjusted R^2 = .14   *p <.05   **p <.001

7.4. Discussion

Study 4 examined the differences in flow and post-gameplay affect between solo and social gaming experiences, and also between different gaming contexts and gameplay types. It also examined the influence of competitiveness and trait aggression on affective outcomes.

Previous research has shown that flow experiences in gaming are associated with positive affect (Klimmt et al., 2007; Smith, 2007). The current study supports this as flow was associated with positive affect following gameplay in both solo and social gaming experiences. It also extends the findings of previous research as social gaming experiences resulted in greater perceptions of positive affect following gameplay than solo experiences. Although this effect was relatively small, it still suggests that gaming is a highly enjoyable experience, and that playing with others rather than alone leads to greater positive mood after gameplay. This supports numerous studies that have shown enjoyment from playing with others is a key motivation for many gamers (e.g., Chappell et al., 2006; Griffiths et al., 2004a), and indicates that the social dimensions of gaming are strongly associated with positive feelings after playing. These effects can derive from the feelings of social support, and the opportunities for engaging in a common activity with friends, which can enhance positive feelings. This is consistent with leisure theory in acknowledging the influence of social support as an important benefit which leisure activities can provide (Caldwell & Smith, 1988). It also supports the value of considering gaming within the leisure framework, and further suggests its utility in examining the experiences and outcomes of gaming.

The correlational and regression analyses of flow and affect scores in solo gaming experiences found flow to be positively related both to positive and negative affect. This finding is anomalous, particularly since there is no theoretical explanation which can account for the relationship between flow and negative mood. However, this could be related to the findings of Study 2, that individuals who experienced low flow, showed reduced positive affect after gameplay, compared to high and medium flow groups. A similar effect may have been operating for some individuals in the current study. It is possible that there is an underlying mechanism by which those who experience low flow to experience greater negative affect after gaming. If this is the case, it suggests the importance of examining flow levels as a means of examining the balance of positive and negative gaming outcomes. Alternatively, the distinctions in findings between studies could result from their relative designs. Whilst Study 2 examined the changes in negative affect before and after gameplay, Study 4 only examined post-gameplay mood. Study 4 therefore provides no evidence of the influence on gameplay in *changes* to negative affect. It may be the case that participants felt equally negative before playing, suggesting that gaming experiences (e.g., flow) had minimal influence or were unable to alleviate negative mood. It is equally conceivable that this was also the case for positive mood. Pre-test measures would have provided a means of testing these potential confounds.

The results showed that there were no significant differences in flow between solo and social experiences. That is, experiences of flow were equivalent, regardless of whether gamers were playing alone or with others. This extends previous research by providing examining flow within gamers' reflections of their "real-life" social gaming contexts. This requires further empirical examination as some researchers have suggested that flow in games can be interrupted by the presence of others (Sweetser & Wyeth, 2005). Given this suggestion, it would be expected to find differences in flow between solo and social gaming experiences. The current study's findings seem to contradict this, and indicate that flow experiences are equivalent. One possible explanation is that there are different types of flow operating under different gaming conditions, as the social presence of others facilitates flow in a different way than when playing alone.

There were also no significant differences in experiences of flow or affect between types of gameplay (competitive versus cooperative) and gaming contexts (online versus offline). This suggests that whether gamers were playing in the presence of other people or over the Internet, competitively or cooperatively, equivalent levels of flow during gameplay and similar affective outcomes were experienced. This is partially consistent with the findings of Eastin (2007), who found no differences in post-gameplay state hostility between cooperative and competitive social gaming tasks. One possible explanation for these findings, specifically between the type of gameplay, could be that classifications of cooperative and competitive play are not always clear-cut. In some online games, for example, players are divided into teams to play cooperatively with each other, but also play competitively against other teams. This makes it difficult to distinguish the differences between types of gameplay, and determine their influence on gaming experiences (e.g., flow) and associated affective outcomes. Further research should build on the initial results of this study to further examine the differences between gameplay types as well as the role of online and offline gaming experiences, and how these are associated with affect following gameplay. It is also important to consider the success of gaming sessions as a further influence on gaming experiences and associated outcomes. If a gamer is unable to complete a mission or loses to another player when playing competitively, this is likely to influence mood differently to a successful game session. Future research could ask gamers to consider a specific gaming event, identify its nature and describe the extent to which it was positive or negative.

Competitiveness influenced negative affect following gameplay for solo gaming experiences, but not for those which were social. Specifically, lower trait competitiveness resulted in higher negative affect following gameplay. This is an interesting finding, and the counterintuitive direction of the results could be explained by the fact that high trait competitiveness interacts with gaming in a positive way. People of lower competitiveness may therefore derive less positive experiences from gaming (particularly given the competitive content of many games), and result in feeling less positive after playing. The influence of competitiveness in gaming has not been previously established in real-life gaming contexts, therefore, the current study provides new insight into its influence on affective gaming outcomes. It also develops the qualitative findings of Study 3, which presented contradictory results on the

influence of competitive gaming on both enjoyable and frustrating gaming experiences. The current study provides further support for the notion that high competitiveness does not necessarily interact with playing videogames in a negative way to influence negative gaming outcomes. Rather, individuals of lower competitiveness may experience gaming less positively, and potentially feel less positive after playing. Further, trait aggression influenced post-gameplay negative affect in both solo and social gaming contexts. This suggests that components of aggressive personality influence the negative affective outcomes of gameplay, and supports previous research findings that personality variables (e.g., trait hostility) influence negative outcomes (e.g., aggressive responding; Gentile et al., 2004). A potential confound of the influence of trait aggression on post-gameplay negative affect, however, could be simply the fact that these two variables are positively associated. That is, people high in trait aggression may have a general negative mood orientation. Research would suggest this to be the case since Harmon-Jones and Harman-Jones (2010) found a positive relationship between trait anger and negative activation. The current study would therefore have benefitted from the implementation of a control sample. This could have been used to examine the associations of negative mood and aggression and competitiveness, and provide greater insight into these relationships.

The finding that aggressive personality influenced negative affect contrasts with the findings of Study 2, in which no associations were found. A potential explanation for this distinction could be that Study 2 was conducted within a controlled experimental context, in contrast to the current study which examined <u>reflections on real-life gaming experiences</u>. The differences in design and the way in which gameplay processes were examined could have influenced the results. Specifically, the potential influence of external dynamics (e.g., context, presence of other non-players in the room) in the current study may have resulted in enhanced negative affect compared to the controlled nature of Study 2. Regardless of these issues, the current findings suggest that future research should acknowledge the influence of aggressive personality on gaming experiences. In particular, research should examine its influence on preferences for engagement with highly violent videogames, and the derived enjoyment from playing them. This would provide greater insight into personality influences on gaming motivations, experiences and associated outcomes,

extending the videogame paradigm to further understand the extent to which negative outcomes are influenced by individual characteristics rather than simply violent media exposure.

The limitations of the current study relate to its largely retrospective nature. This may have made it difficult for participants to accurately recall their experiences and feelings within specific gaming sessions and contexts. It is also conceivable that gamers chose to reflect on highly positive experiences, resulting in a bias in the results. Future research addressing this issue could ask gamers to provide an account of flow and mood straight after a pre-determined gaming session for a more accurate report of these experiences, and to prevent any experience selection bias. This would be a more ecologically valid means of examining these factors than experimental research, particularly when investigating the influence of gaming contexts on experiences and effects. This further suggests the importance of conducting research within real-life gaming contexts.

A further limitation is that participants were not required to indicate the number of players involved within the social gaming accounts. Eastin (2007) found that larger group sizes in social gaming lead to more pronounced outcomes (e.g., higher state hostility) suggesting that this could have been controlled to a greater extent within the current study. Differences in group sizes between participants' accounts could have created confounds in the current study, and masked potential differences in flow between solo and social gaming experiences. That is, because differences in group size cannot be established in the current results, it is unclear whether this influenced gaming experiences and outcomes. It should be acknowledged, however, that this is a relatively new way of investigating this area, and so it was not possible to examine all factors within one study. Further examination of influences such as group size and dynamics provide an area of further empirical research.

A large proportion of gaming research uses between-subjects designs to compare participants between conditions (e.g., Anderson & Carnagey, 2009). The nature of the within-subjects design in the current study provides a comparative examination *within* gamers for solo and social gaming experiences. This prevented individual differences between conditions potentially confounding the results. Although this may have

increased the probability of participant fatigue effects, it was deemed most suitable for the nature of the research, as it could examine differences within individuals, rather than between them. It is recommended that more videogame research adopts within-subject designs to better understand the diversities of gaming factors (e.g., experiences and effects) within, rather than between individuals. This can provide a more useful insight into the dynamic nature of gaming contexts, experiences, motivations and associated outcomes for individual gamers, on which there is limited evidence in the available literature.

Although the literature has begun to acknowledge the importance of social experiences of gaming, the majority of this research primarily focuses on these experiences within online game contexts. There is little research examining the influence of offline social contexts and gaming processes on experiences and effects. The current study has addressed this by examining different gaming contexts and gameplay types for experiences of flow and the affective outcomes of gaming. Although there was little evidence of differences in flow between these experiences, the results showed higher positive mood after playing socially compared to playing alone. These findings provide new evidence suggesting the positive influence of social contexts on the outcomes of gaming.

CHAPTER 8: GENERAL DISCUSSION

The overall aim of this research was to use a leisure theory perspective to examine the motivations, experiences and outcomes of playing videogames. This was undertaken using a mixed-methods approach to address the different research questions. The specific aims of the research were: 1) To examine gaming motivations and flow, and their associations with psychological well-being. 2) To examine the influence of experiences of flow in gaming on affective outcomes, and how these are influenced by aggressive personality and competitiveness. 3) To examine the influence of social gaming experiences and contexts on gaming experiences and affective outcomes. 4) To address the attitudes and meanings of gaming experiences for regular gamers. The main results and conclusions are presented in the following sections.

8.1. Main findings
8.1.1. Motivations
Studies 1 and 3 found that the motivations for playing videogames were reported to be achievement, social, and immersion/distraction. Further, motivations could also be categorised as initial and enduring. The need for distraction was influential in initialising gameplay, whilst social, achievement and curiosity motives maintained engagement in gameplay. These motives, in some cases, arose from specific aspects of videogames (e.g., an intriguing storyline which promotes curiosity). No research to date has examined the influence of specific game aspects as motives for playing videogames, and this research contributes initial evidence towards understanding which game aspects influence gaming motivations. This suggests the need for future research to examine specific game genres as these are likely to vary as a function of the game and its constituent parts. To date, research has only examined motivations for a handful of game genres (e.g., sports, role-playing, MMOs) and specific games (*Nintendo Wii: Boxing*) (Kim & Ross, 2006; Pasch et al., 2008; Tychsen et al., 2008). More substantial evidence on gaming motivations and associated experiences is required for other types of games to develop further understanding of the role of motivations in determining engagement in gaming across the range of game types.

Individual and external variables were also evident in gamers' accounts of key motivations for playing games. Mood influenced motivation, suggesting diversity

within individuals for playing different types of games. External factors (e.g., time available) also determined motivations to play games. Commitments (e.g., university courses) which could be time consuming resulted in gamers choosing to play games which more effectively fitted into daily life. These results suggest the dynamic nature of gaming motivations, and calls for a reconsideration of the theoretical framework underpinning research on game usage. The current evidence moves beyond the gamer category framework, which is commonly used within the literature (e.g., Bartle, 1996; Yee, 2007), to develop a framework which incorporates both external factors and individual influences on participation. Figure 5 presents a working model that incorporates internal and external variables influencing players' motivations, including motivational themes (e.g., escapism, fantasy) associated with different game types. This can provide an initial examination of the diverse motivations both for different game types and within individual players.
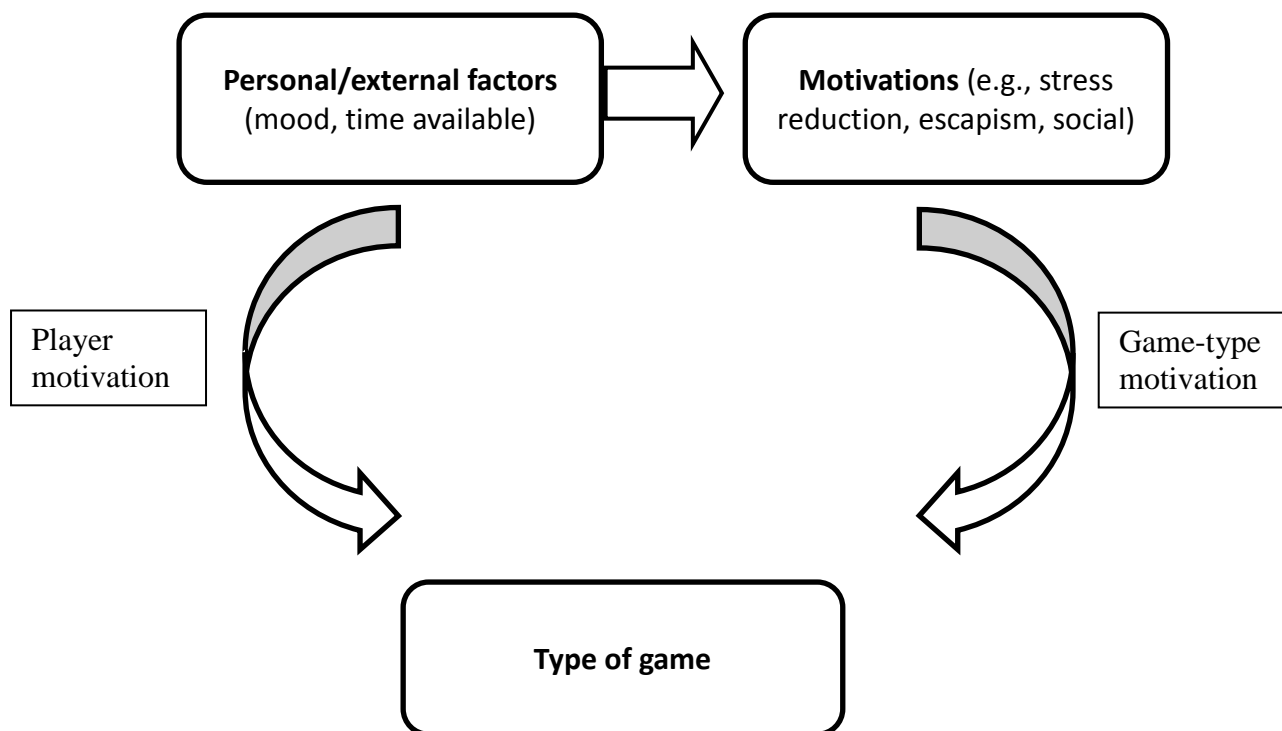

Figure 5: A framework for examining player and game-type motivations.

Acknowledging these diverse motivations for gaming engagement both between and within individuals suggests that gaming can be somewhat idiosyncratic in nature, although there do appear to be classes of motivations shared across gamers. That is,

although there are common motivational themes (e.g., social, escapism), individual gamers appear to be motivated to play different types of games for different reasons. These diversities appear to derive from both internal and external factors. These variations in motivations and their associated experiences also suggest that the outcomes of gaming are equally diverse. Existing models which propose aggressive outcomes of violent videogame exposure (e.g., the General Learning Model; Buckley & Anderson, 2006) cannot fully examine the influence of such a range of individual differences and diversities on a range of potential diverse outcomes. The current findings move beyond previous research by showing individual differences in overall gaming experiences, suggesting that people experience and are affected by games differently at different times and in different contexts. This has theoretical implications since it suggests a range of potential gaming outcomes, rather than assuming solely aggressive ones. Based on this evidence, the current research proposes a Process Model of Gameplay (see appendix 8), which integrates motivational factors as having an influence on a range of potential gaming outcomes. The proposed model will be discussed in further detail later in this chapter.

8.1.2. Motivations and flow

Study 1 also found that gaming experiences were influenced by different motivations. Specifically, the quantitative parts of Study 1 found that achievement and immersion-orientated motivations were predictors of flow in gaming, consistent with Csikszentmihalyi's (1975) contention that autotelic flow experiences are intrinsically rewarding. As no previous research has examined these links within the context of gaming, the current study offers new evidence of the core components which constitute the overall gaming experience. It highlights the importance of understanding what gamers expect to derive through their gaming experiences in order to determine whether the processes of gaming satisfy their motivations, and their combined influence on gaming outcomes. This may suggest that a mismatch between a gamer's motivation and their gaming experience may result in negative outcomes (e.g., frustration), rather than enjoyment and flow. Study 1 showed that immersion, social and achievement-orientated motivations predicted dimensions of psychological well-being, indicating the importance of considering motivations to a greater extent within the videogame paradigm. This key finding requires greater exploration, specifically with regards to the varied motivations gamers may have for

specific types of games, and how these variations are linked to experiences of game enjoyment. Based on the qualitative findings from Studies 1 and 3, it appears that although there are general categories of gaming motivations which can be associated with flow, these categories are not consistent for an individual gamer across all types of game. These variations in motivation may result in different gaming experiences for different types of game. Utilising a framework which incorporates differences between types of games for motivation could prove useful, and provide evidence for the influence of different gaming motivations on a range of gaming experiences.

8.1.3. Experiences

The qualitative findings revealed that enjoyment, flow and relaxation were positive gameplay experiences. These experiences, however, were largely dependent on specific game-types and characteristics. For example, the extent to which gaming could be relaxing depended on the type of game: e.g., *BioShock* was too intense to be relaxing, whereas *Flow* was reported as being a very relaxing game. Negative feelings of frustration arose, particularly if the game was too difficult or in instances of poor social dynamics between players. These findings demonstrate that the nature of gaming experiences is largely dependent on specific aspects of the game. For example, perceptions of social connectedness and social belonging enhance enjoyment whilst social abuse from other players particularly in online contexts, promote feelings of frustration. These findings imply that consideration of specific game aspects and social contexts is required when examining gaming experiences. Lessons can be learned from aspects of User Experience (UX) and Human-Computer Interaction (HCI) research which examines the affective interactions of players and games (Klimmt, 2003; Ravaja, 2004). User Experience research also integrates three categories for examining gaming experiences: game system experience, individual player experience, and the influence of temporal and spatial context on the player-game interaction (Nacke, Drachen & Göbel, 2010). This approach provides a useful framework for examining the interactions between gamers and specific games, and can offer insight into specific game characteristics which influence enjoyable (or unenjoyable) gaming experiences. Psychological gaming research should move beyond simply examining the effects of playing videogames, and aim to identify gamers' experiences in relation to the specific types of games they play, and how

these influence gaming outcomes. This would provide a better understanding of "why" effects occur, compared to knowing only "what" the effects are.

The qualitative parts of the research, specifically in Study 1 and 3 found that flow experiences occurred in gaming. This was characterised by a distorted sense of time, deep concentration, transcendence of self, loss of self-awareness, and overall enjoyment of the activity. These experiences were often reported in connection with specific game aspects which could facilitate flow states. For example, storylines were found to be immersive and could draw players into games. Additionally, realistic game mechanics could effectively facilitate flow-like states. These processes could be as a result of players' deep concentration on rich, detailed game aesthetics which draw them into the game (Jones, 1998; Sweetser & Wyeth, 2005). This evidence further suggests the importance of considering how the constituent parts of games influence gaming experiences. Further empirical investigation is required to examine the differences in flow experiences between game types, to understand how particular game components interact with positive gaming experiences, and their influence on gaming outcomes.

8.1.4. Flow and outcomes

Experiences of flow in gaming influenced positive affective outcomes and activation in Study 2. Study 4 found that flow predicted post-gameplay positive mood for both solo and social gaming experiences. This develops the findings of Study 2 by examining the influence of flow in real-life gaming contexts. using gamers' retrospective accounts of social gaming experiences and outcomes, and contrasts with previous research which has examined aspects of social gaming within the laboratory. Although acknowledgement is made of the limitations associated with the retrospective nature of this method, it is argued that this provides a more ecologically valid examination of social gaming experiences.

There was some evidence, however, that flow was associated with negative mood following solo gaming in Study 4. Chapter 7 explored the potential explanations for this counter-intuitive result. It was suggested that this effect could be the result of a sub-group of participants who experience low flow when gaming. Since Study 2 found that low flow experiences resulted in reduced positive mood, it is possible that

this underlying mechanism could also enhance negative mood following gaming and explain the findings of Study 4. These findings can also be referred back to the four-channel flow model (Massimini & Carli, 1986), to suggest that this sub-group of participants could be categorised within the low skill-low challenge channel of the model, in which feelings of apathy are experienced. This suggests the importance of examining the potential influence of the skill-challenge balance as an association between the challenge of games, gamers' skill levels, and based on previous gaming experience.

There was little evidence of differences between the type of gaming context in social gaming experiences (i.e., online versus offline), or competitive and cooperative gameplay types on experiences of flow and affective outcomes. This suggests that social gaming was as equally as enjoyable, regardless of the social context or type of gameplay. This research extends the literature by providing new evidence for the links between flow and affective outcomes for different real-life gaming contexts. As no research to date has utilised the flow framework for examining social gaming experiences, the current research provides new insight into this phenomenon. This provides an interesting addition to the current literature, and also questions the existence of "group flow" (Sato, 1988). Based on the findings of Study 4, it appears that social gaming experiences can, to some extent, facilitate experiences of flow. The extent to which this experience differs from the traditional flow experience, however, cannot be established from the current findings therefore, a recommendation for future work is suggested.

The findings from Studies 2 and 4 suggest that gaming facilitates flow, and that this is most strongly associated with positive affective outcomes, regardless of the context in which it occurs. This is supported by the similarity of flow scores between studies, and suggests that this is a result of the inherent structure of games. Study 3 extends this by suggesting that game aspects such as mechanics, soundtrack and narrative facilitate flow-states in gaming. This extends the literature by providing evidence of the way in which the processes of gaming, and games themselves can facilitate positive gaming experiences.

The current research findings are also consistent with the literature indicating that flow is associated with a range of positive outcomes (e.g., feelings of positive affect, enjoyment, arousal and some dimensions of psychological well-being) (Ellis et al., 1994; Haworth & Hill, 1992). It suggests that the enjoyment and positive experiences which gaming provides (like other leisure activities) can enhance life satisfaction and psychological well-being (Haworth, 1997; Haworth & Hill, 1992). Playing videogames, like other leisure activities, can also promote well-being through its stress-relieving qualities (Berger, 1994; Coleman & Iso-Ahola, 1993; Iso-Ahola, 1988), and reduce negative feelings and enhance mood (Iwasaki & Mannell, 2000). The social opportunities which gaming provides can promote social support and feelings of social belonging, which can also enhance well-being (Caldwell & Smith, 1988). This suggests that positive experiences during gaming have wider psychological and affective implications for well-being. It is important, however, to acknowledge that the results of Study 1 were discussed in relation to the range of potential influences on psychological well-being and life satisfaction (e.g., work, relationships). It would be imprudent, therefore, to assume that flow in gaming is the sole influence of enhanced psychological well-being. Regardless of this issue, the current findings are consistent with the literature showing the positive associations between leisure engagement and well-being. This supports the contention that examining gaming within a wider context of leisure can provide additional understanding of its dynamics and outcomes.

8.1.5. Personality influences

The current research explored the influence of trait competitiveness and aggression on mood following gameplay. This was examined both within experimental (Study 2) and real-life gaming contexts (Study 4). Although trait aggression did not influence gaming experiences (i.e., flow) or outcomes in Study 2, it interacted with negative affect in Study 4. Specifically high trait aggression was related to higher negative affect following solo and social gameplay. The inconsistencies between studies could be as a result of differences in gameplay processes. That is, Study 2 was a highly controlled, solo gamplay session, in which participants played a pre-determined game, for a pre-determined time. The gameplay dynamics of participants in Study 4, however, could not be examined. The influence of variables such as external dynamics, type of game played, and mood prior to gameplay, for example, were not

controlled. It is possible that the differences in dynamics between studies could have influenced different gaming experiences, and associated outcomes. Specifically, the potential influence of external dynamics (e.g., context, the presence of others) in Study 4 may have resulted in enhanced negative outcomes compared to the controlled nature of Study 2.

Study 4 also found that trait competitiveness interacted with negative affect. Individuals low in competitiveness had higher negative mood following solo gameplay. This finding is interesting as it would be expected that higher rather than lower competitiveness would be more likely to be associated with negative affect. A possible explanation may involve aspects of gameplay performance. It is possible that variables such as success or failure in gameplay could influence the affective outcomes of gaming. In this case, individuals of lower competitiveness may not be driven to win to the same extent as those high in competitiveness. This could result in a lower success rate in gaming, influencing greater negative affect following gameplay. It is equally conceivable, however, that those high in competitiveness may feel more negative than those low in competitiveness in instances of game losses. The mechanisms behind these findings remain unclear, and this potential confound requires further control in future research. This is a particularly relevant issue as it would provide greater understanding of the factors which influence performance in gaming (e.g., game difficulty, competitiveness of others) and how these are associated with outcomes. This is particularly relevant for extending the theoretical understanding of flow and "group flow" in the context of gaming, as it could identify the influence of gamers' previous experience and skill level on gameplay experiences and the associated outcomes. This would help extend the theoretical basis of the gaming effects literature, to accommodate the importance of considering the influence of gaming processes on the range of potential outcomes.

Although previous studies have acknowledged individual differences and personality influences on aggressive gaming outcomes (e.g., Bartholow et al., 2005; Krahé & Möller, 2004), there is little evidence of how they influence gaming experiences, and whether this differs as a product of gaming context. The current research provided initial evidence to suggesting that trait aggression and competitiveness influence negative affective outcomes, and that this is, to some extent, dependant on the nature

of the gaming context (solo or social). Negative affective outcomes, however, are distinct from aggressive ones, therefore it is unclear whether the Study 4 would have found evidence to suggest the influence of trait aggression and competitiveness on aggressive gaming outcomes. The literature, however, shows associations between negative affect and facets of aggression (Harmon-Jones & Harmon-Jones, 2010), suggesting negative affective outcomes may translate into aggressive ones. Further consideration of personality influences both in solo and social gaming contexts is required, to provide a better understanding of the potential range of influences on gaming outcomes. Competitiveness should also be further examined in relation to different types of games. Individuals high in competitiveness are likely to seek and derive enhanced enjoyment from games which facilitate opportunities for competition, particularly when playing socially. Sports games are of particular relevance for examining these processes as they tend to contain a substantial competitive content. Research of this nature should also examine the issue of performance in gameplay, and the associated differential outcomes following successful or unsuccessful gaming sessions. Acknowledging the influence of gameplay performance is a key component of the theoretical understanding of the range of gaming outcomes since it has implications for current models which examine the sole influence of game violence on aggressive outcomes, since these do not incorporate this variable as a moderator of alternative outcomes.

These findings provide new evidence about the influence of aggressive personality on real-life gaming experiences and outcomes. Although a substantial amount of research has examined the influence of aggressive personality on aggression outcomes from violent videogame exposure, no research to date, has examined the affective outcomes in the context of real-life gaming experiences. Further, it utilised an approach which accounted for a balance of positive and negative outcomes, to provide an alternative perspective to the majority of the existing literature. The current research provides a useful insight into the links between videogame-play and aggression. Whilst a substantial amount of previous research has apparently shown a "causal" link between exposure to violent game content and aggression-related outcomes (e.g., Anderson et al., 2010), the current study provides an alternative perspective, and questions the simplicity of the proposed link. The results suggest that these associations are complex, and demonstrate that stable traits, such as aggressive personality, influence

the outcomes of gaming. This notion is supported by Eastin (2007) who suggested that the sophistications of gameplay require a more comprehensive model than that of the GAM, and should consider the influences of moderating variables (e.g., type of gameplay, social group size). Given the complexities and range of influences and moderators, this presents a challenge for researchers when producing models of the outcomes of gameplay. These issues will be re-visited later in this chapter.

8.1.6. Attitudes towards game violence and effects of playing violent videogames

Study 3 developed the literature by examining gamers' attitudes towards violent game content and their potential influence on negative aggressive outcomes. No research to date has examined these issues in relation to gamers' attitudes, so the current findings provide an important insight into gaming experiences. The results suggested that gamers perceived violent game content as highly distinct from reality, despite the high quality of graphical realism in many games. Violence in games was also largely seen as a necessary by-product of the competitiveness of the majority of games, and was often the only means of completing game objectives. This suggests that engaging in violent acts is perceived as an integral part of games, rather than as a reflection of hostile acts per se. This suggests that future research should move beyond examining in-game levels of violent actions *per se* as evidence of aggressive behaviour, and consider gamers' choices of actions in games. For example, many games provide players with options to act in either a good or an evil way. Examining gamers' choices within this type of context would provide stronger evidence of gamers' preferences for different types of interactions with games, and whether violent acts are performed through compulsion or by choice. Such evidence would provide a useful indication of the importance of game violence for specific gaming experiences, rather than simply assuming that "violent" games require gamers to act violently all the time. These findings provide new insight into gamers' attitudes towards game violence, which, to date, as received minimal theoretical and empirical attention. This has implications for previous studies which have not fully examined the in-game decisions of players, and have inadvertently assumed that in-game violent acts are reflective of an individual's aggressive behaviour (Anderson & Morrow, 1995), rather than key components of games. Examining these factors would provide a useful extension of the work on moral engagement in violent gameplay which addresses the psychological and emotional experiences associated with violent game behaviours,

and how this may relate to gaming outcomes (Young & Whitty, 2010; 2011). Understanding individual differences in emotional and psychological responses to violent game content and gamers' choices of violent acts can provide a more comprehensive account of the potential range of outcomes of violent gameplay.

It was also revealed that gamers hold strong views opposing the claims that violent videogame play influences aggressive behaviour in the real world. Because violent game behaviour is often distinct and mostly lacks a realistic representation of real-life, this results in little transferability to real life violence. These findings provide an alternative to Anderson and colleagues' findings that violent game exposure influences aggressive behaviour. The alternative findings can be attributed to the distinctions in theoretical and methodological approaches, including the study design and type of sample. The current research used focus groups with regular gamers in contrast to Anderson and Carnagey's (2009) research, for example, which used an experimental design with undergraduate psychology students completing laboratory measures of aggressive behaviour. These distinctions in ecological validity between studies could influence the associated results. It could be argued that the current research had enhanced ecological validity due to the fact that responses were not those of non-gamers or within a laboratory context. Instead, they revealed a reflective narrative of the attitudes of gamers themselves. This suggests that a stronger focus on suitable samples of gamers within real life gaming contexts is required. This can enhance the generalisability of findings to real-life gamers, compared with using samples of non-gamers. It further suggests the importance of considering gamers' attitudes rather than using artificial gaming situations. The gamers used in the qualitative research may, however, have had biased attitudes on this issue as a consequence of their recruitment from games-related courses. As an experienced /serious gamer sub-group, their discussions about issues of violence and its influence on aggression may reflect a defensive attitude to their leisure activity. However, the finding that gamers expressed little support for claims that videogame violence influences real-life aggressive behaviour extends the theoretical basis for understanding the influence of violent game content for a sample of gamers.

These findings from Study 3 also question the utility of measuring aggressive thoughts, attitudes and feelings as indications of transferability to real-life aggressive

behaviour. Given that the current findings suggest that, for these players at least, aggressive attitudes do not transfer to behaviour, attitudinal outcome measures of aggression (e.g., attitudes to violence questionnaires, word completion tasks) seem misleading for indicating aggressive behavioural outcomes of gaming. Measures of aggressive feelings and cognitions should therefore be considered as distinct from aggressive behavioural measures, and not to be used as evidence to support contentions that violent videogame exposure influences real life aggressive behaviour. When using research to inform public policy addressing the potentially harmful influence of violent videogames on aggressive behaviour, evidence should involve studies which have used direct measures of aggressive behaviour (e.g., history of violence, delinquency), rather than aggressive feelings and thoughts.

8.1.7. Summary

The current research has contributed new insights into the dynamic nature of gaming motivations and experiences, and their influence on a range of gaming outcomes. Taken together, the current findings demonstrate the complexities and challenges which face researchers in this area. In response to these complexities, the current research presents a working Process Model of Gameplay. This model acknowledges the influence of gaming motivations, including personal and external variables (e.g., mood, personality, time availability), type of game, and gaming experiences on a range of potential outcomes. There is also consideration for the influence of moderators (i.e., social context, and performance in gameplay) on these outcomes. This presents a dynamic process framework for examining variations in gaming motivations, game choices, and experiences, and their influence on associated outcomes. Existing theoretical models (e.g., GLM, Buckley & Anderson, 2006) are limited as they do not sufficiently recognise or incorporate the dynamic interactions between the individual and the characteristics of the game. The current model extends this by integrating the influence of personal factors on choice of game-type and extends the theoretical underpinnings of the gaming effects literature by suggesting that the processes of gameplay can potentially lead to a range of both positive (e.g., increased positive affect, psychological well-being) and negative outcomes (e.g., aggressive cognitions, negative affect). Whereas the majority of existing theory assumes the sole influence of violent game content on aggressive outcomes, the proposed process model acknowledges the importance of gameplay processes.

Although the role of the social-cognitive models which underpin the influence of game violence on development of aggressive responses (e.g., GLM; Buckley & Anderson, 2006) have explanatory value, the Process Model suggests that these potential effects can be counter-balanced by the positive experiences which gamers can derive from the experience. It also suggests gaming outcomes to be largely dependent on variables such as gameplay performance which, to date has not been examined in the literature. Utilising this Process Model can provide a means of accommodating the dynamic nature of gameplay, which is largely under-represented in the theoretical and empirical literature.

Although the empirical findings of the research programme provide support for the range of influences included within the Process Model of Gameplay, future research is required which examines the validity of the proposed framework. Extending the qualitative findings from Study 1, gamers could be asked to provide an account of their motivations for specific types of games, and examine the extent to which these are satisfied following gameplay. For example, if gamers play a specific type of game as a means of reducing stress, it would be interesting to examine the extent to which this results in lower stress following gameplay.The Process Model could also be tested by assessing the extent to which aspects of personality (e.g., trait competitiveness) influence game choices, and examine the influence of gameplay performance on gaming outcomes. This could consist of examining gamers' accounts of their skill level in relation to the challenge of the game, and its influence on gaming experiences (e.g., enjoyment, frustration).

8.2. Methodological approach

A mixed-methods approach was particularly relevant for the current research programme as it aimed to address different types of research questions. A qualitative methodology was required to address the nature of gamers' attitudes, and examine the diversity and dynamic nature of gaming motivations and experiences. In contrast, experimental research was most relevant for ensuring control when examining the influence of flow on changes in mood. Further, the nature of the experimental context could reflect the traditional videogame research paradigm, whilst demonstrating the importance of resolving previous study limitations (i.e., control of games, limited time period, and sampling). This was useful in developing the empirical evidence of the

associations between gaming experiences and a balance of gaming outcomes. Further, using online questionnaires was an effective means of recruiting a larger sample of gamers. Online questionnaires can provide greater access to samples of videogamers compared with previous lab-based studies of convenience samples (Anderson et al., 2004, Bushman & Anderson, 2002; Cicchirillo & Chory-Assad, 2005). The use of sampling from populations of gamers is particularly important since the flow literature has established that an activity (e.g., gaming) must be intrinsically rewarding in order for the flow state to occur (Webster et al., 1993). This suggests that in samples of non-gamers, where there is little intrinsic motivation for gaming, flow is unlikely to be experienced. This has implications for the ecological validity of such research, and the generalisability of associated results to gamers. Differences in motivations, as well as lack of familiarity with gaming, could account for the observed aggressive thoughts and behaviour resulting from gameplay demonstrated in previous studies. Future research should specifically address this limitation through the use of samples of gamers, and a central focus on the gaming experience itself.

The use of mixed methods complements the research process as the different methods built on each others' relative strengths and limitations. For example, the deductive properties of quantitative research can limit the extent to which new and emergent ideas can arise. In contrast, the inductive nature of qualitative methods provides a more exploratory approach for addressing research questions. The qualitative aspects of the current research were particularly relevant for the nature of some research questions as they could provide an "active voice" for gamers, and examine the linguistic relevance of gamers' experiences, which are so far, under-represented in the literature. Understanding the meanings gamers attribute to their gaming experiences can be useful for developing theoretical understanding of issues, and informing further research (e.g., developing measures).

Although qualitative methods are often criticised for small sample sizes, this can be disputed based on the fact that as additional focus group sessions took place, there was a decrease in new information being raised. As Study 3 used a homogeneous sample of gamers, it is likely that similar issues and attitudes would be discussed within the sessions, resulting in limited usefulness of conducting more than four focus groups. In reference to Study 3 findings, there was reasonable consistency in the

themes being discussed across the four focus group sessions, which supports the contention against limited sample sizes.

Limitations associated with qualitative methods, particularly with thematic analysis should be acknowledged, however. Thematic analysis, by nature, presents evidence for theory as a set of themes. It has been argued that the researcher's role in constructing these themes may be distinct from the way themes may be interrelated in a participant's own mind (Boyatzis, 1998). Further, there is a likelihood for researcher projection. That is, it is possible that the researcher's own conceptualisations can be projected onto meanings derived through the research (Boyatzis, 1998). This presents a confound when interpreting research findings. Using other forms of qualitative analysis (e.g., discourse analysis) could potentially provide better control over these influences, since they can deconstruct the meanings taken from participants' responses to a greater extent. On reflection, however, it seems that the qualitative findings of would be largely similar, regardless of the type of analysis used. It can be further argued that the influence of the researcher's own views goes beyond simply the interpretation of qualitative data. This could also potentially influence other aspects of the research process, including study design and interpretation of the quantitative data. This is a persistent issue in empirical research, and should not be solely associated with qualitative methodologies.

The further use of idiographic approaches in examining gaming within leisure frameworks would provide greater understanding of the meanings associated with the activity. Qualitative methodologies can also further address the dynamic and personal nature of gaming motivations and experiences, an issue which is under-represented in the theoretical and empirical literature. Interviews and focus groups can provide the most suitable method for examining individual variations in motivations for playing different games, and their influence on different gaming experiences and outcomes. This can move beyond models which assume all gamers experience, and are affected by games in equivalent ways. Given that the current research suggests varying gaming motivations and experiences both between and within gamers, theoretical models such as the GAM/GLM are restricted in their ability to examine such diversities, and suggest the need for an approach which is largely idiographic to address the range of gaming outcomes.

8.3. Limitations

8.3.1. Retrospective nature of flow measures

A limitation of the research is that flow was measured retrospectively. Although Study 2 included an immediate retrospective measure of flow in gameplay, Study 1 included a general measure of frequency of flow in gaming and Study 4 used a relatively longer time interval for the retrospective flow account. This could be a potential limitation, although subjective flow is difficult to measure by any other means. Some researchers have suggested the use of objective measures as a way of examining gaming processes and experiences, including the use of physiological measures of brain responses (e.g., P300 activation) (Salminen & Ravaja, 2007, 2008), physiological stress (Hébert, Béland, Dionne-Fournelle, Crête & Lupien, 2005), and emotions (Mandryk & Atkins, 2007; Ravaja, Saari, Turpeinen, Puttonen & Keltikangas-Jarvinen, 2008). This approach allows researchers to quantify emotional and physiological states throughout the gaming experience, while in the *process* of play, rather than measuring the *outcome*. The importance of examining the process of gaming has been emphasised by a number of researchers (e.g., Mandryk & Atkins, 2007; Pagulayan, Keeker, Wixon, Romero & Fuller, 2002), as it can provide a better account of the influence of gaming experiences on outcomes.

Physiological measures may, however, be an inappropriate means of data collection when using the flow framework since intrusive equipment could interfere with the experience of flow. Further, measuring physiological mechanisms does not permit an understanding of the *meaning* of the experience to the individual which is a key component of understanding individual flow experiences (Pace, 2004). Nacke and Lindley (2008) suggested that the primary consideration of gaming research should be the subjective experiences of gameplay through examining flow, presence and immersion. Their research provides a compromise which utilises both objective and subjective measures of gameplay experiences. Using facial electromyography (EMG) to measure electrical activity behind the movements of the facial muscles to assess emotion, and galvanic skin response (GSR) to assess physiological arousal, they aimed to show that these objective measures were associated with questionnaire-based measures of gameplay experiences. Their findings showed that challenging game conditions facilitated flow, and that the most significant increases in arousal and

activity on the EMG were for positive emotion. This study provides a useful demonstration of the physiological responses that accompany psychological states of gameplay experiences.

Adopting an equivalent approach of using objective and subjective measures could be useful for researchers examining gaming experiences and outcomes, although for studying flow specifically, subjective measures are best suited, as it is an experience which is personal and meaningful to individuals (Csikszentmihalyi, 1975). This can be undertaken by means of self-report either using qualitative methodologies or by traditional self-report flow measures (e.g., Flow State Scale, Experience Sampling Method) immediately following gameplay.

8.4. Personal reflection

Reflecting on the limitations outlined in the previous section has led me to consider the PhD journey more generally, and reflect on the process as a whole. These considerations refer both to my own personal learning process, and also to the aspects of the research which I could have done differently. This will be considered in greater detail below.

Study 1 measured frequency of flow in reference to general gaming experiences. On reflection, it would have been more useful to ask participants to identify a specific period of gameplay on which to reflect the *intensity* of flow experiences. This would have provided a more meaningful examination of the intensity of flow for particular games or game-types. As it stands, Study 1 did not ask participants to specify a specific gameplay session. It therefore cannot examine potential differences between game-type, or the influence of different social contexts (solo and social gameplay) on flow experiences. This flow measure was also restricted by the fact that it only included one item for each flow dimension. This could have lowered the reliability of the results, leading the findings of the associations between achievement and immersion-orientated motivations and flow, and flow with dimensions of psychological well-being, to be considered with caution. If I was to repeat this study, I would use the Flow State Scale (as in studies 2 and 4), which would improve both the reliability of the findings (as it includes four items for each flow dimension), and measures the intensity of flow experiences.

The motivations scale used in Study 1 could also have benefited from further refinement. On reflection, I could improve this study in two ways. Firstly, I could consider using a more established motivational scale (e.g., Yee's [2006] user motivations). This scale was developed for measuring online gaming motivations, however, therefore its utility for offline contexts is questionable. Secondly, I could have proceeded the research programme with a qualitative study, as a means of obtaining gamers' accounts of the range of motivations. These themes could then have been used in the development of a motivations scale for further use in the subsequent studies of the research programme. This would have enhanced the validity of the current findings, and provided greater support for the research's conclusions relating to the influence of gaming motivations on gaming experiences and outcomes.

It may have also been useful to include a post-test written measure of aggression in Study 2. This would have allowed the findings to be more comparable to those of previous lab-based studies, which have measured aggressive outcomes. If the findings revealed no differences in post-test aggression scores between game conditions, firmer conclusions could have been made in relation to previous studies' findings.

Although Study 2 made some attempt to control the two games for the main study, the strategy used has some limitations. The pilot study would have benefited from more participants, to obtain a greater number of ratings for the short-listed games. It is also possible that the two games were potentially too similar to elicit different affective states. That is, the lack of significant differences in post-gameplay affective measures between the experimental conditions in Study 2 (main study) could be due to these potential similarities. If I was to repeat the experimental study, I would use one game with different modifications to allow a manipulation of level of violence. Previous research has utilised this form of manipulation quite effectively when comparing different levels of blood exposure to measures of hostility and physiological arousal (e.g., Barlett et al., 2008). This would ensure greater control over the influence of specific game aspects on the measured outcomes.

Despite these limitations, the research as a whole provides a useful framework for examining the processes involved in gameplay, how these are associated with different gaming motivations, and the associated affective and psychological outcomes.

8.5. Future Research

In addition to the areas of future research outlined previously in this chapter, a number of further areas have been identified. These include the influence of aesthetic aspects of the game on gaming experiences, game platforms and the different types of gamers. The influence of active forms of gaming on general well-being, with reference to the wider contexts of leisure will also be considered as an area for future research.

8.5.1. Videogame aesthetics

Study 3 found that game sound, colour and aesthetic appeal are related to gaming experiences. This suggests that further research should examine videogame forms and aesthetics as a key aspect of the sensory and experiential aspects of gaming, and their psychological and social impacts on gamers. Knez and Niedenthal (2008) examined the effects of different coloured lighting in videogames on affect and play performance. They found that warmer colours (e.g., red) had a greater impact both on positive affect and on gameplay performance compared to cooler colours (e.g., blue). This suggests the utility of examining the impact of newer generation technology and videogames which have greater realism, to gain a greater understanding of their influence on a range of experiences and associated effects. This highlights the need for future gaming research to use the most up-to-date technology (e.g., new generation consoles) in order to provide a comprehensive examination of the advancement of videogames and their potential effects. The need for advanced technology is also highlighted by evidence that more immersive technology and higher quality of media features such as visual resolution, image size, and picture motion can influence responses to media (Bracken, 2005; Detenber et al., 1998; Liu, Lioa & Pratt, 2009; Persky & Blascovich, 2008). Similarly, more positive experiences (e.g., higher presence and arousal) have been shown to be associated with playing newer rather than older games (Ivory, 2006; Ivory & Kalyanaraman, 2007). Adopting an approach which embraces the interaction between the player and the complexity of

the game is vital to understand the experiences and outcomes of gaming. Human-Computer Interaction models (e.g., Playability, Player Experience) (Nacke, Niesenhaus, Poels, Drachen, Korhonen, IJsselstaijn, et al., 2009) are a useful reference for examining these interactions, and for gaining a better understanding of how this influences the psychological and affective experiences and outcomes of gaming for the player. Further research utilising this approach could extend the findings of the current research by examining variations in flow experiences during gameplay as a product of specific game characteristics (e.g., realism, graphical advancement).

8.5.2. Types of gamers

Although the current research utilised a leisure framework as a means of examining gaming experiences, it did not distinguish between different types of gamers based on their gaming experiences. Stebbins' (1992) notion of serious leisure suggests that there are differences between casual and serious gamers in the intensity of their gaming experiences and associated outcomes. Associated differences in time investment, perseverance and intensity for example, are likely to predict differences between types of gamers in their experiences of the deep sense of involvement and a sense of achievement derived from the activity. This also suggests that motivations may differ between these gamer types, as casual gamers may be more likely to play to pass the time, whereas serious gamers may play for challenge, prestige or advancement in games. These different motivations may also influence different outcomes following gameplay. For example, casual gamers who play to pass time may experience greater negative affect after gaming if they have been playing games as a means of procrastinating from other activities. In contrast, serious gamers who play for the drive for achievement may not experience such effects. This is worthy of further investigation, since no research to date has examined the implications of such distinctions for gaming motivations, experiences and outcomes. This would also inform understanding of the patterns of engagement of different types of gamers in the activity, and the extent to which these are consistent with the serious and casual dichotomy in leisure theory. This would extend the current research which examined general gaming motivations and experiences in a wide sample of gamers (Study 1 and 4) and in more 'serious' gamers (Study 2 and 3). A study providing a systematic comparison of gaming motivations and associated experiences (e.g., flow) between

205

different types of gamers would further contribute insight into the way in which commitment to gaming as a leisure activity influences associated gaming experiences and outcomes.

8.5.3. Game platforms

The results of the qualitative aspects of the research suggest that there may be differential gaming experiences associated with different gaming consoles. For example, the Nintendo Wii may be "more fun" than more traditional types of consoles as it is primiarily used as a platform for offline social integration among friends. The potentially different social experiences that different consoles provide should be examined in future research to determine the extent to which these influence the outcomes of gaming. Many gaming consoles are also evolving social gaming experiences which provide gamers with greater opportunities for social play and interaction. The consistent evidence that social support and connections in leisure influence well-being has potential implications for understanding the outcomes of gaming, and provide a justification for studying gaming within wider leisure contexts. Given this, a particularly interesting study would be to examine the social experiences which different game consoles can provide. This would be particularly worthwhile given the increasing popularity of social gaming for a broadening range of players. As the *Nintendo Wii,* for example, is primarily an offline social gaming experience for "real life" social interactions, and the *Xbox 360* fosters both offline and online social experiences (with real and virtual friends), the social experiences they facilitate are likely to be distinct.

In addition to examining social experiences as a function of different videogame consoles, it would also be interesting to examine cross-platform differences for other types of experiences (e.g., flow and enjoyment). It has been suggested that console games can better facilitate flow than PC games, given the complexity of the keyboard controls required for PC games (Johnson & Wiles, 2003). It has also been found that physiological arousal is higher when playing on television-based consoles than on mobile devices (Ivory & Magee, 2009).

8.5.4. Active gaming and well-being

The current findings suggest that flow experiences when playing videogames are associated with some dimensions of psychological well-being. This is consistent with previous research which has established links between leisure engagement and greater psychological well-being. The existing literature also provides a consensus that active forms of leisure are more positively related to measures of psychological well-being (Biddle & Mutrie, 2001). This can result from buffering against potential stressors, enhancing social support and relaxation, and promoting physical health by facilitating positive affective states (Stokes & Frederick-Recascino, 2003). Although videogaming is usually considered to be a passive leisure activity, the development of more active consoles (e.g., *Nintendo Wii, PlayStation EyeToy, Microsoft Xbox Kinect*) and games (e.g., *Wii Sports Resort, Dance Dance Revolution),* suggests that gaming is evolving into a more physically active form of leisure. Although research has studied the physical benefits of active forms of gaming for energy expenditure (Maddison et al., 2007; Ridley & Olds, 2001), there is little evidence of the psychological benefits of active gaming. It seems reasonable that there could be positive implications for well-being, consistent with other active forms of leisure. Based on little evidence in the available literature, including the current research, future research could examine the influence of physically active gameplay using specific consoles on gamers' physical and psychological well-being, and identify whether there are distinctions from more "passive" gaming consoles. This could provide more evidence for the potential positive effects of playing videogames, and its potential related benefits for participants.

8.5.5. Violent games and real life violence

Considering gaming within a leisure framework can accommodate a broader perspective, to examine why individuals play violent videogames, and their associated experiences and outcomes. This can present evidence to suggest that gaming is a highly popular leisure activity, for a wide range of individuals. This questions the extent of the claims that playing violent videogames is associated with real life violence, since the frequency of these behaviours is not prevalent in such a large population of individuals. This has implications for existing theory and research which presents causal claims of such associations, and suggests the proposed links to be due a more complex interaction of variables (e.g., personality, contexts). Future research which addresses the associations between violent videogame-play and real-

life aggressive behaviour should acknowledge individual differences and the wider context in which gaming occurs (e.g., social contexts, family violence). This can provide a better understanding of the range of "risk" factors for real-life violent behaviour, rather than restricting the focus simply to game violence. Empirical work should aim to use direct measures of aggressive behaviour, rather than proxy laboratory measures which are often criticised for lacking external validity (e.g., Ferguson & Rueda, 2009). Further, to better understand the influence of violent game content on attitudinal and behavioural outcomes, it is useful to understand the experiences derived through violent gameplay. Examining experiences (positive and negative) of playing violent videogames can suggest the potential outcomes for individual gamers. The use of qualitative methodologies is most suitable for this purpose, as they can examine subjective, meaningful accounts of the importance of game violence and the way in which it influences the nature of the gaming experience and the associated outcomes. For example, gamers who enjoy the fantasy of engaging in violent gameplay can fulfil this gratification through playing violent games. This is likely to result in greater positive affect following gameplay. Acknowledging that people experience games differently suggests the need to reconsider the videogame paradigm. Integrating an approach which examines the influence of individual differences and acknowledges a range of differences between types of games can provide a more comprehensive framework for understanding the range of experiences and outcomes of playing violent videogames. This requires the use of a process model of gameplay which can examine the variations in gaming motivations and experiences to provide an explanation for a range of different outcomes.

8.6. Conclusion

The research programme outlined in the thesis was motivated by the need to provide an alternative perspective for examining aspects of gaming, particularly when considering the potential range of effects of the activity. The approach taken represents a reconsideration of the theoretical and empirical evidence of gaming outcomes, in order to present an alternative focus to research which focuses on the negative effects of playing violent videogames. The existing conceptions of the links between violent videogame-play and violent and aggressive behaviour are too simplistic. Similarly, attributing poor academic performance and youth violence solely to videogames is unjustified (Eow, Ali, Mahmud & Baki, 2009), as these are

influenced by a more complex interaction of variables which require greater empirical examination before valid conclusions can be drawn. Research requires a greater recognition of the wider psychological, cultural and social influences which are potential determinants of these behaviours in contemporary society. This suggests the need to reconsider the videogame research paradigm to incorporate a greater range of influences (e.g., personality, history of violence, adverse socialisation experiences) on potential outcomes. Acknowledging these influences would be particularly useful when addressing concerns over the role of technologies in daily life. The moral panics associated with the development of technology-related addictions (e.g., gaming, online social networking), fail to acknowledge sufficiently the underlying experiences involved in this behaviour. For example, frequent playing of sports videogames could be categorised as a form of gaming addiction, whilst frequent participation in sports in the real world is perceived to be acceptable, and by no means negative. Although these are equivalent experiences in relation to the structural aspects of engagement (e.g., flow, challenge), they are often conceptualised differently due to the medium through which they are played. The role of modern technology within everyday life raises concerns which are not entirely justified when considering the underlying experiences these media provide. An approach which integrates the wider cultural and societal applications of the technology (e.g., videogames) can help deconstruct its role, and demonstrate its potential positive influences in people's daily lives.

The current findings suggest that the theoretical underpinnings of the literature require further reconsideration. Existing models remain too restrictive in examining the balance of positive and negative gaming outcomes, and cannot accommodate the dynamic nature of gaming motivations and experiences. This suggests that existing models require a broader focus, which can be achieved by adopting a leisure theory perspective for examining the influence of gaming motivations and experiences on outcomes. This approach acknowledges gaming within wider contexts, as a leisure activity within the daily lives of gamers (Study 3). Further this approach can enable an examination of the potential of engagement with gaming to provide equivalent benefits to other leisure activities (e.g., enhancing well-being and reducing stress), through enhancing competency, and providing relaxation and distraction (Caldwell, 2005). It is logical to assume, therefore, that because gaming can facilitate positive experiences, these can lead to similar benefits for gamers. This suggests that the key

factor is the *process* of gaming rather than simply violent game content. The paradigm should therefore adopt a greater focus on this issue, and consider gaming within the wider context of leisure to provide a more comprehensive understanding of the activity and its associated outcomes. This provides an alternative approach from existing theory which presents a restrictive perspective on the sole influence of game violence on aggressive outcomes.. In addition, using leisure theory frameworks (e.g., flow) can examine the subjective, meaningful nature of gaming experiences for individual gamers. This provides new insight into the gaming experience, contributing new understanding of this topic, which is particularly relevant given the personal nature of gaming experiences.

Researchers should also acknowledge the structural and experiential complexities of videogames, and not make generalisations about gaming experiences and outcomes from one game to all others. They should also recognise that gamers experience games differently, and that these experiences are influenced not only by the type of game, but also the context in which it is played, and gamers' motivations and preferences. The current research suggests that individualistic and idiographic approaches are valuable and suitable for studying the motivations, experiences and outcomes of playing videogames. This is particularly important when considering the diversity of motivations for individual gamers and their game choices according to a range of variables (i.e., mood and time available). This notion of individualism is particularly important since gaming is a personal experience characterised by an interaction between a game and the player. This requires greater recognition in the literature and subsequent research if greater understanding of the experiences and associated consequences of playing videogames is to be achieved.

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