EXPLORING THE CHARACTERISTICS OF VIOLENT VIDEO GAME PLAYERS

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Thesis submitted to the University of Nottingham for the degree of Doctor of Forensic Psychology

May 2018

ABSTRACT

The role of violent video games (VVG) in increasing levels of aggression in players is a topic that has been debated for decades. While a simple cause and effect relationship is not present, it is apparent from the literature that VVGs do have a relationship with elevated levels of aggression within some players. The first chapter of this Thesis presents a systematic review of the literature focusing on additional factors included in the research to explain this finding. However, a lack of standardisation in both measurement and reporting of results making interpretation difficult. The second chapter provides a critique of the non-experimental methods used within video game (VG) research. The third chapter focuses on a non-experimental study which highlighted the differences in aggression, motivations for playing, empathy, and personality in a group of VVG players. The final chapter presents the results of a service evaluation of the management of VGs within a high secure psychiatric hospital, which highlighted the real-world implication of an unclear literature base. The conclusions of this thesis highlight the variation in the quality of the literature available and stresses the need to conduct research with targeted populations, both VG players and clinically populations, to fully understand the relationship between engaging in VVG and increased aggression.

OVERVIEW

Systematic Review

The review focused on the current research relating to the VG violence debate, with attention paid to the additional variables that are included to explore the relationship further. Sixty-two papers were identified, with thirteen additional variables included such as other pastimes, family, mental health, and substance misuse. The results of the review highlight the number of different methods and measures used in the literature, which unfortunately makes drawing firm conclusions difficult.

Critique of Methods

The critique built on the results of the systematic review by focusing on the methods used within non-experimental research. The critique emphasised the benefits of non-experimental research regarding ease of use and flexibility for targeting populations of interest, as well as stressing the importance of using standardised measures to improve replicability and reliability within findings.

Empirical Research Project

The empirical research explored whether there are observable differences in players' interpersonal styles based on their decision to engage in optional violent content within an 18-rated VG. Participants were categorised based on their choice, and their scores for measures relating to motivations for playing VGs,

empathy, trait aggression, and personality were compared. Nine hundred and six players took part, and significant differences were found in all measures, with aggression being predictive of players' choice to skip or play the violent content, and motivations, empathy, and personality being predictive of participants choice to either observe or actively engage in the content. The results of the study highlighted the importance of understanding motivations for playing VGs when exploring the potential effects of VGs. It also highlighted the role of subtle effects (such as personality differences) rather than solely focusing on outcome measures relating to aggression.

Case Study

The case study presented the results of a service evaluation of the management of VGs within a high secure hospital. Three members of staff took part in an interview to establish the management of VGs, and thirteen members of ward staff took part in a questionnaire exploring their understanding of how it was managed on the ward. The results of the study highlighted the concerns of hospital staff about the appropriateness of the VG accessible in the hospital. The study gave a unique insight into the real-world impact of concerns about the effects of VGs and offers future directions for researchers to aid clinical decision making.

ACKNOWLEDGEMENTS

Thank you to my research supervisors, Professor Kevin Browne and Dr Shihning Chou for your guidance and support throughout this project, as well as the feedback on early submissions. I would also like to thank Dr James Tapp for his support in the development of the case study and his comments on the first draft, and Michelle Christmas for her support as my placement supervisor where the case study was carried out.

Thanks are also extended to the various individuals that helped me in locating the full copies of papers for the systematic review, as well as to the forum moderators/staff who responded to my request to host the empirical research project.

I would also like to thank every participant that has made this Thesis possible, including the VG players who took part in the empirical research, and the high secure hospital staff that participated in the service evaluation. Thank you for your time willingness to be a part of this research.

Finally, I would like to thank my friends and family for their love, support, and patience over the course of this Doctorate. Thank you.

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CHAPTER ONE: INTRODUCTION

1.1. Background

1.1.1. Video games (VGs) have become immensely popular in the past decades and have completely changed people's leisure time. Research in 2017 suggests that there are 2.2 billion VG players in the world, and the VG industry is estimated to be worth $108.9 billion (Newzoo, 2017). Described as the "new kid on the media violence block" (Anderson et al., 2010, p. 152), violent VGs (VVGs) have helped to continue the concern and intrigue of the effects of viewing violence on our own violent and aggressive behaviour. As with the effect of violence in TV and films, despite 30 years of research and numerous reviews, systematic and general, there remains uncertainty over the risks posed by VVGs. While research has concluded that (in some way) media violence and aggression is related, the effect of VVG is not as certain (Sherry, 2001), in part due to the very small (if any) relationships that are found, and concerns about misrepresentation of any significant result that is found (Cumberbatch, 2004; Ferguson & Kilburn, 2009)

1.2. A Brief History of VGs

1.2.1. The term VG is used as a "catch-all" term to describe electronic interactive media (Ivory, 2016, p. 1). While initially restricted to

computers, VGs are now playable on a wide range of platforms such as home consoles developed by VG producers such as Nintendo, Sony, and Microsoft, as well as mobile platforms including handheld consoles, mobile phones, and tablets. As previously mentioned, VGs have increased in popularity, in part due to the availability of them on such a wide range of platforms (Newzoo, 2017). While 49% of American adult's report playing VGs, only 10% consider themselves "gamers" (Duggan, 2015), with the majority indicating that they do not identify as "gamers". This is perhaps reflective of the increase in availability of VGs, which do not meet the stereotype of what people think of when using the term "VG". This highlights how the term "VG" may be reductive in nature, simplifying what represents a wide range of media with different genres, means of playing, and accessibility (Ivory, 2016).

1.2.2. In terms of their history, VGs have developed from electronic simulations of more traditional games such as sporting or combat simulators, and role-playing games. Ivory (2016) proposes that there is a dual ancestry in VGs, with some games grounded in action simulation as their main theme, and others in shared narratives between players. The action simulation ancestry pathway demonstrates how modern VGs have developed from traditional games and sports which themselves have a historical development from simulation war and combat. Both traditional sport and strategy games (such as chess) have their groundings in

simulating war and mortal combat, and modern VGs (such as the war simulation game *Call of Duty* or the football simulation game *Fifa*) have continued this interest. This pathway highlights the importance of competition and strategy in these games. On the other hand, the Shared Narrative Ancestry focuses on how shared fantasy narratives (such as Tolkien's Middle Earth) have inspired role-playing games, where players take on the role of another and play on their behalf in a fictitious environment. Initially, this was through table-top games, such as *Dungeons and Dragons*, and then developed into text-based electronic versions, which later included online components to allow more players to take part. This ultimately has led to the development of massively multiplayer online role-playing games such as *World of Warcraft* and *EverQuest.*

1.3. The Impact of VGs on Players

1.3.1. There is a stark contrast in the literature concerning VGs, with one half of researchers focusing on the (often negative) impact of VGs, and another focusing on more positive aspects of game playing such as motivations and skill development. As has been seen in previous research relating to media violence, the research relating to the potentially harmful effect of playing VVGs is often polarising (Egenfeldt-Nielsen, Smith, & Tosca, 2008). Some researchers argue that exposure to violent content can increase aggression in players

(Anderson & Bushman, 2001). However others and argue that there is no such effect (Ferguson & Kilburn, 2009), or chose to focus on other areas such as skill development (Ferguson, 2007b) or motivations for playing (Yee, 2007). Egenfeldt-Nielsen, Smith and Tosca (2008) separate the literature into the Active User Perspective and the Active Media Perspective.

1.3.2. The Active Media perspective is argued to focus predominately on the active influence that media (in this instance, VGs) has on recipients, which are often seen as passive to its influence. It usually involves the comparison of two groups (e.g., one playing VGs and one that does not) and examining which is more aggressive or violent. A common criticism of this perspective is that it often reliant on experimental data, meaning that there is a lack of ecological validity that makes it hard to apply the findings to real life (Olson, 2004). Likewise, there is difficulty in establishing causality due to the measurements used, with some researchers arguing that instead of measuring aggression, it is instead misplaced competitiveness or possibly frustration from playing a VG for a short period of time (Adachi & Willoughby, 2011). Other problems include improper matching of games (not matched for competitiveness or engagement levels) and other methodological issues (such as poor measures) and a lack of understanding about the functions and processes of the VGs. (Dill & Dill, 1998;

Egenfeldt-Nielsen, Smith, & Tosca, 2008; Ferguson & Kilburn, 2009; Porter & Starcevic, 2007).

1.3.3. In comparison, the Active User Perspective focuses on the context of VG playing, how it affects the players and examines the functions of engaging in VG playing. It focuses on the complexity of VG playing and how it can affect an individual and rarely has violence as its central focus. The advantage of this perspective is that it focuses on more positive aspects, such as motivations and experiences of gaming. For example, Barnett and Coulson (2010) explored the psychological impact of massively multiplayer online games (MMO) and found that most players feel connected in a personal level to a community, and discussed the relationships formed with other players. Yee (2007) outlined the motivations players have for engaging in VGs, as well as exploring what motivations players have for engaging in excessive gaming. This research allows for closer inspection of what functions VGs serve for players, as well as highlighting that individuals who play VGs are not a specialised population, and have the same motivations, wants and desires as the general population.

1.3.4. The causal link between VGs and real-world violence is controversial, with many studies muddying the water by using the term "aggression", and "violence" interchangeably (Cumberbatch, 2004). Violence can be defined as "the exercise of physical force so

as to injure or damage persons or property; otherwise to treat or use persons or property in a way that causes bodily injury and/or forcibly interferes with personal freedom (Archer & Browne, 1989, pp. 10-11). Aggression, on the other hand, can refer to intent (the desire to harm another), the presence of actions which cause damage or are likely to do so (threat or actual behaviour), and emotional state (anger) (Archer & Browne, 1989). Often what is measured in studies relating to the impact of VVGs on players is increases in aggressive behaviour or cognition, with some researchers suggesting that these increases could be indicative of real-world violence (physical aggression) (e.g. Anderson & Dill, 2000).

1.3.5. High profile acts such as the Columbine and Virginia Tech school shootings increase the attention on VGs containing violent content (Adachi & Willoughby, 2011). However, some researchers argue that the most emotive claims of VGs causing real-world violence tend to be made in the media as opposed to scientific literature (Ferguson, 2008). Recent examples include former US attorney Jack Thomson blaming VVGs for creating copycat killings or allowing would be killers to practice their skills (which was made the subject of the drama documentary *The Gamechangers* in 2015). However, critics are quick to remind such perspectives that youth violence (including extreme incidents such as school shootings) have almost halved, despite the rapid increase in VVGs (Coulson &

Ferguson, 2016). The high-profile claims of such 'non-scientists' helps to further what Ferguson describes as the new age moral panic, with VVGs being blamed for corrupting the youth (Ferguson, 2008). One link to real-world violence that does appear to be significant is bullying, with studies finding VG playing to be a risk factor (albeit a very small one) for bullying (Ferguson, San Miguel, & Hartley, 2009; Olson, 2004). However, focus on the extreme events such as school shootings draw attention away from these "smaller" issues (Olson et al., 2009).

1.3.6. By linking VGs (especially violent ones) to real-world violence, it has created a new moral panic, which is spurred on through media reporting and pseudo-science books encouraging fear, public concern, and ill-informed opinions (Ferguson, 2008). Ferguson argues that a cycle now exists whereby a controversial game is released (e.g. *Call of Duty: Modern Warfare 2*, which is the focus of the empirical research presented in Chapter 3) which leads to unsupported statements from people who aren't scientists or are anti-VGs suggesting that these games will be harmful, for example MP Keith Vaz calling for Modern Warfare 2 to be banned (New Game Lets Players Kill Civilian's in Terror Attacks - Daily Mail, 2009), which in turn leads to speculative "evidence" trying to link the controversial VG to a real world violent act (e.g. Suicide bombing a Russian airport Domodedovo International Airport: Moscow Airport Terror Mirrors VG – Russia Today, 2011). The

media portrayal, however, sells to the public and allows VGs to be used as a scapegoat for people's actions (Kutner & Olson, 2008).

1.3.7. Models for Explaining the Effects of Violent Media on Users

1.3.7.1. One model proposed for how VGs can affect players is the General Aggression Model (Anderson & Bushman, 2002). The General Aggression Model (see Figure 1) highlights how different social encounters can be interpreted based on an individual's personal or situational factors, which can then be influenced based on individuals current internal state, which can influence whether thoughtful or impulsive actions are taken as a result, which ultimately influences future social encounters and restarts the cycle.

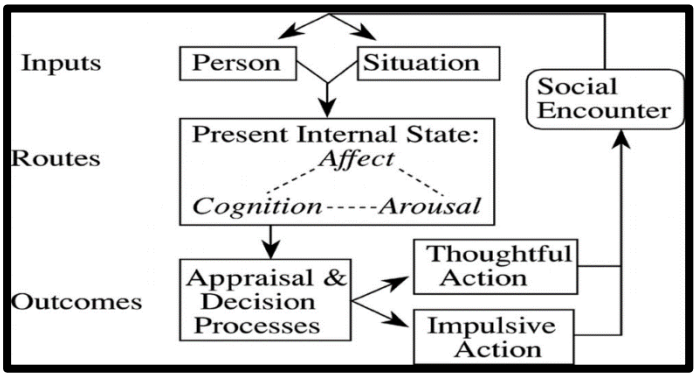


Figure 1: The General Aggression Mode, reproduced from Anderson and Bushman (2002)

1.3.7.2. The role of VVGs is proposed to add an additional stage (see Figure 2) whereby repeated exposure is believed to have an impact on an individual's personality, which will affect how a person interprets future social encounters.

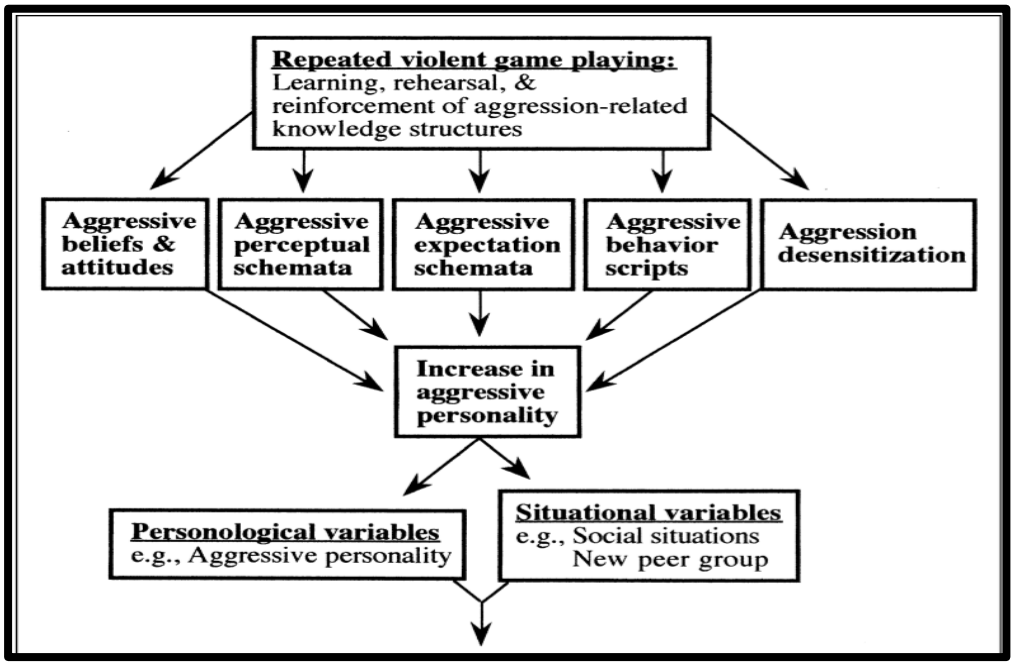


Figure 2: The General Aggression Model Personality Processes, reproduced from Anderson and Bushman (2002)

1.3.7.3. Another model is the Browne and Pennell model for the development of preferences for violent films (Pennell & Browne, 1999). The model (see Figure 3) highlights the role that violent films (or possibly VVGs) reinforce previously distorted ideas about the role of physical confrontation (based on previous experiences and an individual's personality) which, depending on an individual's empathy and moral beliefs, could lead to offending behaviour. In both models, violent media is believed to have a reinforcing effect on the appropriateness of engaging in aggressive behaviour.

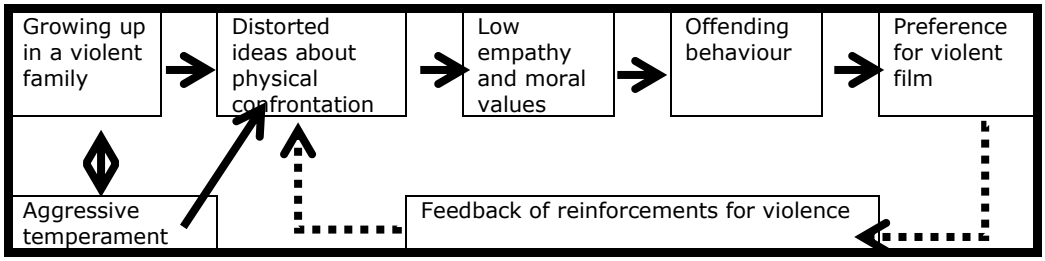


Figure 3: The Browne Pennell Model for the Development of Preferences for Violent Films, as cited in Browne and Hamilton-Giachritsis (2005).

1.3.7.4. An alternative model for explaining the effects of VVGs on players is the catalyst model. Like the Browne Pennell model, the catalyst model (Ferguson et al., 2008) highlights the role media violence can influence an individual who has already developed an aggressive personality (see Figure 4).

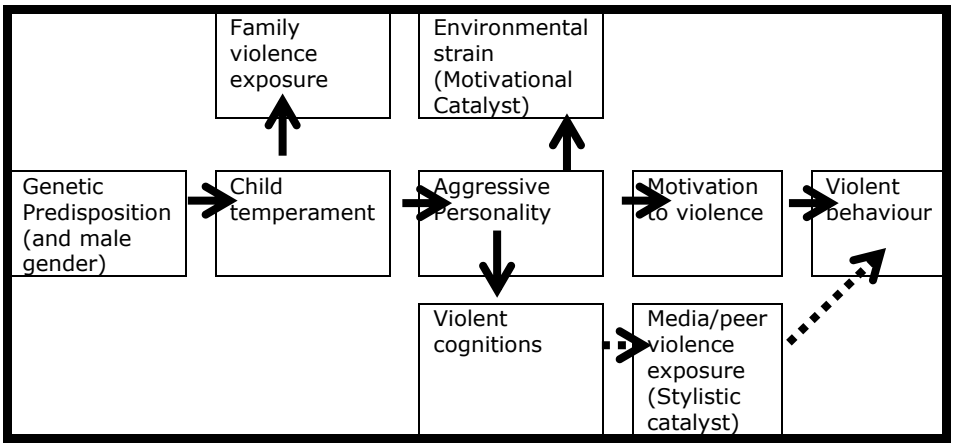


Figure 4: Catalyst Model reproduced from Ferguson et al. (2008)

1.3.7.5. This model highlights how an individual's predispositions (including exposure to family violence and temperament) can lead to the development of an aggressive personality. As with the previous model, this disposition may then lead to more motivations for violence and subsequent violent behaviour. However, it also highlights the role of two separate factors, named motivational

catalysts and stylistic catalysts. The motivational catalyst is likely to influence an individual's motivation for violence, in that environmental strains, such as finances or social problems may increase an individual's motivation to behave violently. The stylistic catalyst refers to the style in which aggressive thoughts (cognitions) are acted upon, which Ferguson and colleagues suggest is where both media and peer exposure is likely to influence violent behaviour that is carried out. In comparison to the previous models, rather than having a direct reinforcing role, violent media is believed to influence a person's pre-existing violent cognitions, whereby the individual may model what they have seen in the media.

1.4. Current Thesis

1.4.1. The aim of this Thesis was to explore the current state of the literature, concerning the most recent research and its implications regarding the links between engaging with violent entertainment and real-world aggression. Chapter one presents a systematic review of the literature which focused on more recent research exploring the additional factors included studies on the relationship between VVGs and aggression. Chapter two presents a critique of the non-experimental research, which examined the strengths and weakness of this research method and offered recommendations for future research. Chapter three presents an empirical research

project carried out with players of the VVG *Call of Duty: Modern Warfare 2* (Activision, 2009), examining whether players' choice to engage with optional violent content was predictive of personality styles linked to aggression. Finally, Chapter four presents a service evaluation of the management of VGs within a forensic mental health service to highlight the clinical implication of the current state of the literature.

CHAPTER TWO: SYSTEMATIC REVIEW

What Additional Factors Are Explored to Explain the Effects of Video Games in the Modern Day Media Violence Debate? A Review Following the Systematic Approach

Abstract:

The media violence debate has been going on for decades, with video games (VG) reigniting the discussion concerns about players being actively involved in violent content rather than just observing it. Given that there are many research studies in the area, there are numerous reviews about the topic seeking to synthesise the research and guide interested parties. A criticism of these is that they are biased to a viewpoint and that they often include old research. The aim of this review was to explore the more recent literature base across all study types while considering what additional factors have been measured to build on the current understanding of the media violence debate. A total of 62 studies were reviewed (17 experimental, 11 longitudinal, and 37 non-experimental). Overall the studies were supportive of the link between VG playing and increased externalising behaviour. However, the nuances of the results highlight that it is important to understand what is meant by this conclusion, rather than if it is universally applicable.

2.1. INTRODUCTION

2.1.1. Despite 30 years of research and numerous reviews, systematic and general, there remains uncertainty over the risks posed by violent video games (VVGs). Research continues to be published either looking at the effects on aggression alone or introducing other variables to try to explain the variance. The aim of this systematic review was to examine the state of the recent research and to identify what other variables have been identified and their proposed influence.

2.1.2. In their original meta-analysis, Anderson and Bushman (2001) identified a small effect size for VVG increasing a range of aggressive measures in participants (behaviour r=.19, cognition r=.27, and affect r=.18). A more recent review found similar rates although some critique this effect should be lower once corrected for what they argue are publication biases (Ferguson, 2007a) or reliance on poor methodologies such as using unstandardized measures of aggression or failing to include reliability statistics (Ferguson & Kilburn, 2009). Ferguson and Kilburn (2009) claim in their later review that studies which introduce a third variable, such as gender, personality, or family environment had lower effect sizes, with more variance being explained by the additional variables.

2.1.3. Recent reviews have identified several other areas involved in the effects of VVGs, including: pathological gaming (Ferguson, Coulson, & Barnett, 2011; Sublette & Mullan, 2012; Prot, McDonald, Anderson, & Gentile, 2012); country where the study took place (Anderson et al., 2010; Ferguson, Coulson, & Barnett, 2011); empathy (Anderson et al., 2010; Prot et al., 2014); prosocial behaviour (Anderson et al., 2010); social problems (Ferguson, Coulson, & Barnett, 2011); academic performance (Anderson et al., 2010; Bensley & Van Eenwyk, 2001); and mental health (Ferguson, Coulson, & Barnett, 2011). Thus, a review was required to examine all the possible "other factors" involved" in recent VVG research.

2.1.4. Ways of Examining the Effects of Violent Video Games on Aggression

2.1.4.1. The effects of VVGs have been explored in a variety of different ways, each with their strengths and limitations. Whichever method is used, the intention is to examine the effects or influence of media (usually containing violent content) on aggression or violence in users. Both approaches hope to explore this either by demonstrating in a clinical environment the possible effects or by showing in the real world how those who access more violent content may be more aggressive than their counterparts.

2.1.4.2. *Experimental*

Experimental studies into the effects of VVGs follow many formats, the most common requiring participants to split into two groups – one will play a VVG, and the other will play a non-VVG, before then being tested on their post play aggression. There are various aggression assessment methods used, ranging from a pen and paper aggression test such as the Aggression Questionnaire (Buss & Perry, 1992) or completing ambiguous stories or words (Bushman & Anderson, 2002), to scenario-based behavioural tests such as the competitive reaction time test (Taylor, 1967) or the hot sauce paradigm (Lieberman, Solomon, Greenberg, & McGregor, 1999). While these studies hope to demonstrate a possible cause and effect, they have been criticised for not having enough gameplay time (Sherry, 2001), which for some participants may be a particular problem if they are not familiar with how to play, for using poorly matched VGs (Jerabeck & Ferguson, 2013), or using non-representative samples of gamers (Olson, 2004).

2.1.4.3. *Non-Experimental*

Non-experimental studies usually explore a participant's experience of violent media content, along with a measure of aggression to examine any possible links. While they may elicit more information and suggest any long-term influence (Anderson & Bushman, 2001), they cannot identify any causality as they are correlational in nature (Kutner & Olson, 2008).

2.1.4.4. ***How These Methods Might Work***

Whichever method is used, the intended effect is to examine the effects or influence of violent media on aggression or violence in users. Both methods hope to explore this either by demonstrating in a clinical environment the possible effects or by showing in the real world how those who access more violent content may be more aggressive than their counterparts.

2.1.5. Rationale and Objectives

2.1.5.1. Following the release of the most recent generation of VG consoles (Microsoft's Xbox One, Sony's PlayStation 4, and Nintendo's WiiU), it was an appropriate time to examine the studies conducted using previous generation consoles (Xbox 360, PlayStation 3, and Wii) and VVGs released in this era used as a method of exploring the recent literature on media violence. This would include the most current and up to date VVGs, many of which have better graphics and greater realism, which, according to the media violence literature, would increase any possible aggression increasing effects (Sherry, 2001). This review will address concerns by some researchers that most of the reviews include studies that are outdated and irrelevant regarding modern day VGs/gaming (Kutner & Olson, 2008). The review also allowed for an overview of possible third variables and measures involved in the current research, which was needed to explore the effects of VVGs (Ferguson, Olson, Kutner, & Warner, 2014).

2.1.5.2. The aim of this review was to examine what additional factors (or "third variables") are included in studies exploring the effects of VVGs. The review will consider all studies conducted since 2005 (which was when the first of the previous generation of consoles was released), to explore the effects of VGs. Therefore, this review will examine recent research on the effects of VGs and identify what additional factors are included to understand the implications explored in more detail.

2.1.5.3. The research question for this review is:

- What are the additional factors now included in VVG research, and what effect do they have on the relationship between VVGs and externalising behaviour?

2.2. METHOD

2.2.1. Scoping Exercise

2.2.1.1. In preparation for this review, a literature search was carried out for existing reviews, which identified nine review papers which did not meet the criteria for being classed as systematic reviews (see Appendix 1 for a summary). Of those that were eligible for inclusion, four were narrative reviews (Bensley & Van Eenwyk, 2001; Browne & Hamilton-Giachritsis, 2005; Mitrofan, Paul, & Spencer, 2009; Sublette & Mullan, 2012) and five were meta-

analyses (Anderson & Bushman, 2001; Anderson et al., 2010; Ferguson, 2007a; Ferguson, 2007b; Ferguson & Kilburn, 2009). The results of the meta-analyses identify a small effect (effect sizes (r) ranging from .15 (Ferguson, 2007b) to .19 (Anderson & Bushman, 2001) for the influence of VVGs on various measures of aggression, which some argue may represent a small but significant problem, while others highlight that it overshadows other risk factors for aggression. The narrative reviews also provided an evaluation of the methods employed (Mitrofan, Paul, & Spencer, 2009). They also explored the impact specifically in children (Bensley & Van Eenwyk, 2001; Browne & Hamilton-Giachritsis, 2005), and highlighted the importance of examining additional effects rather than just focusing on "aggression" (Sublette & Mullan, 2012).

2.2.2. Protocol and Registrations

A protocol for this review was prepared and submitted to the University of Nottingham on the 11.07.2014.

2.2.3. Sources of Literature

The search was limited to papers published after 2005, as this was when the first of the previous generation of VG consoles were released. The following types of primary studies were included: randomised control trials, controlled trials, cohort, case-control, cross-sectional, and before-and-after. The review included both

experimental and non-experimental designs. All suitable studies identified were included (including those published in other languages) and were examined within their categories (experimental or non-experimental). Reviews, commentary, case, or qualitative studies were not included. Relevant papers were sourced using the following search technique:

a. Electronic Databases

- Applied Social Sciences Index and Abstracts
- BIOSIS Citation Index
- Medline
- PsycARTICLES
- PsycINFO
- SCOPUS
- Web of Science
- PROQUEST (dissertation, thesis, conference proceedings, and government reports)

All searches were restricted from 2005 onwards. The search was initially run on the 29.08.2014 and was updated on the 20.04.15 and 16.12.15).

b. Hand Searching

The journal "Computers in Human Behaviour" was hand searched on the 28.11.14, having been identified as a common source of relevant articles.

c. Contact with Experts

The following authors were contacted and requested to forward any research on VGs they have conducted since 2005 (A copy of the email sent can be found in Appendix 2). The British Board of Film Classification (BBFC) and Pan European Gaming Information (PEGI) were also contacted, and relevant research was requested. A list of the papers received is presented in Table 1.

Table 1: Summary of Papers Gained from Experts

Name	Affiliation	Location	No. Papers Received
Professor Kevin Browne	University of Nottingham (Supervisor)	UK	1
Dr Shihning Chou	University of Nottingham (Supervisor)	UK	0
Prof. Mark Griffiths	Nottingham Trent University	UK	3
Professor Craig Anderson	Iowa State University	USA	41
Professor Brad Bushman	Ohio State University	USA	43
Dr Christopher Ferguson	Stetson University	USA	45
Dr Cheryl Olson	www.drcherylolson.com/	USA	0
BBFC			8
PEGI			4

2.2.4. Search Terms

Figure 5 shows a summary of the search terms used for the database search. Please see Appendix 3 for the search syntax

computer* adj game console adj game electronic adj game Nintendo PlayStation video* video adj game Xbox	AND	aberrant aggressi* anger* antisocial attack* belligeren* brutal* corrupt* crime criminal*	cruel delinquen* felon* ferocious fierce furious hostil* injur* law adj breaking	misconduct misdeed misdemeanour offens* sadistic sin transgression vehement violen* wrong*

Figure 5: Search Strategy

2.2.5. **Study Selection**

2.2.5.1. Studies were screened based on their title and abstract, then reviewed against the PECO criteria to determine whether they should be included or excluded from the review. A copy of the inclusion/exclusion form can be found in Appendix 4. Papers that did not meet the criteria were excluded from the study (see Appendix 5 for excluded studies).

2.2.5.2. ***Population***

Studies needed to detail whether participants have experience playing VGs or not. While it was not a necessity for participants to have experience of playing, it was necessary for studies to state their experience level to review studies based on this (e.g. never played, novice, experienced). There were no restrictions on types of populations (e.g. age, gender) to include as many populations and studies as possible.

2.2.5.3. *Exposure (If Applicable)*

Studies that required a VG to be played were conducted using at least a seventh-generation console (Xbox 360, PlayStation 3, and Wii), allowing for reliability regarding game complexity, graphics, and popularity/familiarity. Studies were excluded if they were carried out on earlier consoles. Furthermore, the VGs used need to be clearly stated for checks to be made that they were a publicly available VG, and to check whether they were being used appropriately (e.g. violence rating, matched to other VGs being used).

2.2.5.4. *Types of Outcome Measures*

Studies needed to have some form of aggression and/or violence as their primary outcome for externalising behaviour. Additional variables were reviewed as "other" variables, which were included in the review to provide an overview of other factors involved in media violence research.

2.2.6. Quality Assessment

Identified studies were reviewed against a quality assessment checklist to review their quality and potential risk of bias (see Appendix 6). This included the type of population used (representative vs. opportunistic), whether VGs used were matched regarding their perspective and genre, whether validated measures

were used, and details of power analysis and attrition rates. Each item was scored, with a low item indicating a low risk of bias. This information was then used to review studies based on their risk score. To check for reliability in relation to study inclusion, Cohen's k was run to determine if there was an agreement between the main researcher and a second who was familiar with the study design. 18 cases (7%) were reviewed by the second researcher. There was a strong agreement between the two judgements, $k=.89$, $p<.001$. Where discrepancies arose, a discussion was held between the two researchers in order to establish the reason for the difference. In all cases, the outcome was jointly decided by both researchers.

2.2.7. **Data Extraction**

Information relating to participant details, type of study and brief description, the number of measures and outcomes were extracted from studies into a data extraction form (see Appendix 7). These forms allow for a brief overview of the study, commenting on measures used and results observed, as well as conclusions and limitations noted in the research.

2.3. RESULTS

2.3.1. Study Selection and Characteristics

From an initial identification of over 18,000 papers (in part due to the inclusive nature of the search terms), 69 papers were identified as relevant for the review, including 16 (23%) experimental, 41 (60%) non-experimental, and 12 (17%) longitudinal studies. A detailed summary of the selection process is detailed in Figure 6.

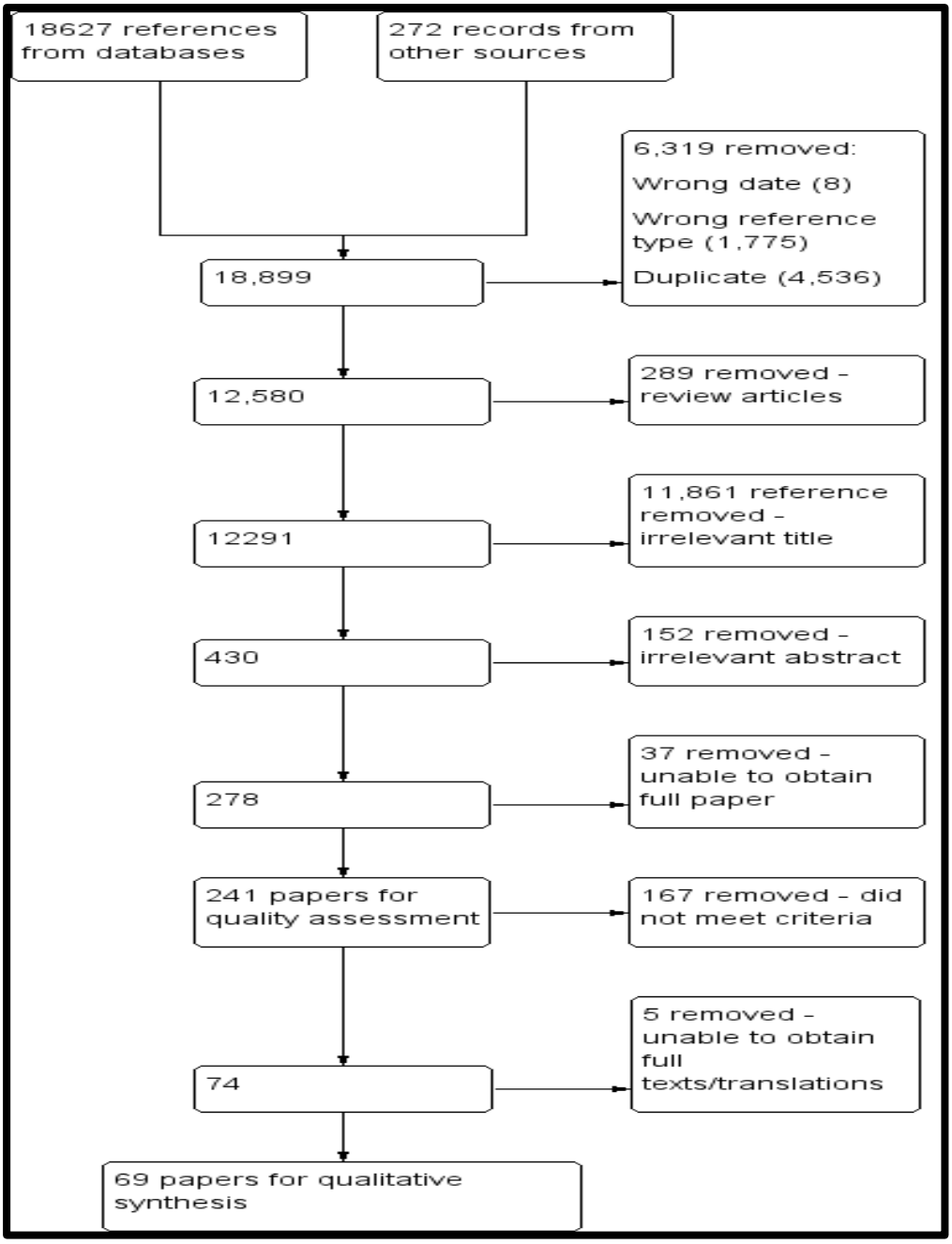


Figure 6: Flow Diagram of Study Selection

2.3.2. **Risk of Bias Within Studies**

2.3.2.1. The quality assessment forms measured the risk of bias across different domains of the studies. While no studies were excluded because of their quality (to reduce possible selection bias and to

ensure a full overview of the literature was reviewed), some studies reported a higher risk of bias than others because of their bias ratings across the different domains.

2.3.2.2. An overview of the risk of bias across studies is presented in figure 7. A summary of the risk of bias for each of the studies can be found in Appendices 8, 9, and 10.



Figure 7: Risk of Bias across the Domains for all Studies

2.3.2.3. The risk of bias highlights that overall there was a low risk of bias for the selection and exposure domains, however, measurement and attrition were more prone to bias. Figure 8 presents a breakdown of each area assessed.

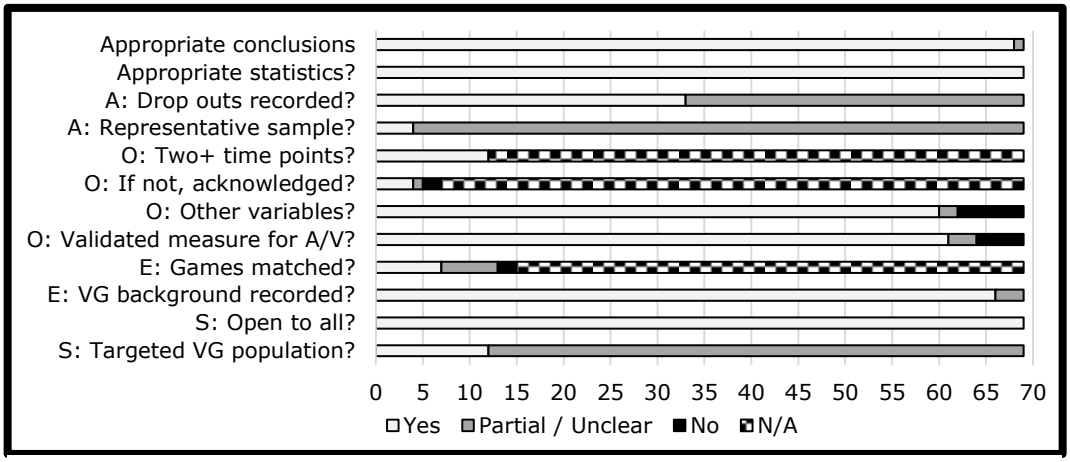


Figure 8: Risk of Bias Across Each Area Assessed

2.3.2.4. ***Sample***

Despite having a low overall risk of bias, only a minority of studies (n=12, 17%) used a targeted VG population, with the others relying on opportunity samples, predominantly university students or school samples, which were argued to likely contain participants who play VGs. In all cases, the studies included were open to all participants rather than being selected by researchers.

2.3.2.5. ***Exposure***

Many of the studies visibly recorded the playing habits of participants (n=65, 96%), with only a few studies (n=4, 6%) using methods that were not overly explicit. For experimental studies (n=16, 23%), seven (445) of the studies were deemed to be matched because they used the same VG but in different contexts. Examples included single vs. multiplayer (Breuer, Scharkow, & Quandt, 2015; Mihan, Anisimowicz, & Nicki, 2015; Velez, Greitemeyer, Whitaker, Ewoldsen, & Bushman, 2014), playing as different characters (Stermer, 2014), various methods of playing

(McGloin, Farrar, & Fishlock, 2015), comparing participants on other measures rather than gameplay condition (Krcmar, Farrar, Jalette, & McGloin, 2015), or instructing players to play the same level in different manners (Mahood & Hanus, 2017). Six studies (38%) had partially matched VGs, that were either similar regarding perspective or genre (Adachi & Willoughby, 2011; Drummond, 2015; Ferguson & Rueda, 2010; Jerabeck & Ferguson, 2013; Valadez & Ferguson, 2012). Only one (6%) study (Arriaga et al., 2015) used VGs that were not similar in any way for the different conditions. One (6%) study (Bartholow, Bushman, & Sestir, 2006) did not include a VG as the independent variable, instead utilising experimental methods to explore effects of self-reported exposure.

2.3.2.6. ***Outcome***

The majority of studies used a validated measure for aggression or violence, with only a few using either unclear measures (such as subscales or modified scales) (n=6, 9%) or used new measures that were developed for the study and had not been validated (n=3, 4%). Many studies included additional variables (n=61, 88%) with only seven (10%) studies using no additional measures, of which four acknowledged the presence of other variables. For longitudinal studies (n=12, 17%), all studies included at least two separate time points.

2.3.2.7. *Attrition*

Attrition was the highest risk of bias, with only four (6%) studies reporting the use of power calculations to generate sample size, and over half (n=33, 48%) of the studies not referring to the number of dropouts in the studies. However, this was not the case for the longitudinal studies, were all (n=12, 17%) stated the number of dropouts.

2.3.3. Synthesis of Results

A summary of the extracted data for each of the studies can be found in Appendices 11, 12, and 13 (original data extraction forms can be found on the enclosed disk). A total of 11 (16%) papers were removed due to not reporting the results of the aggression measure (n=2, 18%), not reporting the interaction between VG play and externalising behaviour (n=3, 27%), not explicitly defining participants VG use (n=4, 36%), not including sufficient data for review (n=2, 18%). Thus, for data synthesis, 58 papers were reviewed with a total 62 studies (as some papers included multiple studies) reported, which included 17 (27%) experimental, 37 (60%) non-experimental, and 8 (13%) longitudinal studies. A summary of the study characteristics is presented in Table 2.

Table 2: Frequency (and Percentages) of Study Characteristics (N=62)

	E		L		N-E		Total	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Number of studies	17	27	8	13	37	60	62	
No. of Participants	2245	3	5764	9	53747	87	61756	
Age								
Under 18	0		7	88	23	62	30	48
18 and over	5	29	0		3	8	8	13
Mixed	7	41	1	13	11	30	19	31
Did not report	5	29	0		0		5	8
Gender								
Male only	2	12	0		2	5	4	6
Female only	0		0		0		0	
Mixed	14	82	8	100	34	92	56	90
Split not reported	1	6	0		1	3	2	2
Sample								
Child	0		2	25	5	14	7	11
School/ college	0		3	38	16	43	19	31
Adolescent	0		2	25	1	3	3	5
Young offender	0		0		1	3	1	2
Student	17	100	0		5	14	22	36
Adult	0		0		2	5	2	2
Mixed	0		1	12.5	7	11	8	13
Gaming specific	*2*	*12*	*2*	*2*	*5*	*8*	*9*	*15*

E = Experimental, L = Longitudinal, N-E = Non-Experimental

2.3.3.1. ***Aggression***

Figure 9 presents an overview of the outcome of the studies in relation to the link between playing VGs and externalising behaviour.

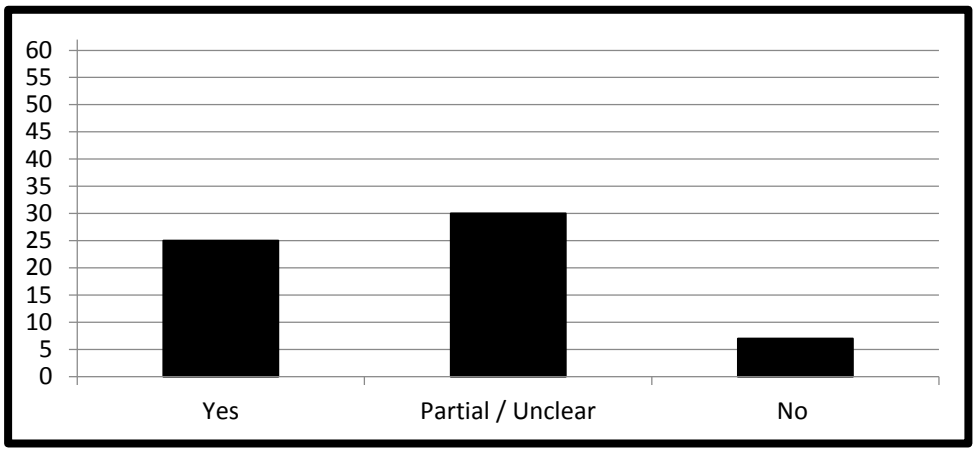


Figure 9: Breakdown of the supportive findings.

Figure 9 highlights how 40% (n=25) of studies find a supportive link between playing VGs and increased levels of externalising behaviour. Furthermore, 48% (n=30) of studies show a potential link, and only 11% (n=7) of studies found no link. As the aim of this review was to examine the additional effects measured, a full review of the results in relation to aggression was not presented, however, a brief overview is presented below.

2.3.3.2. ***Other Factors***

Apart from five (8%), all studies included at least one additional variable separate from aggression. A summary of the other factors measured is presented in Figure 10.

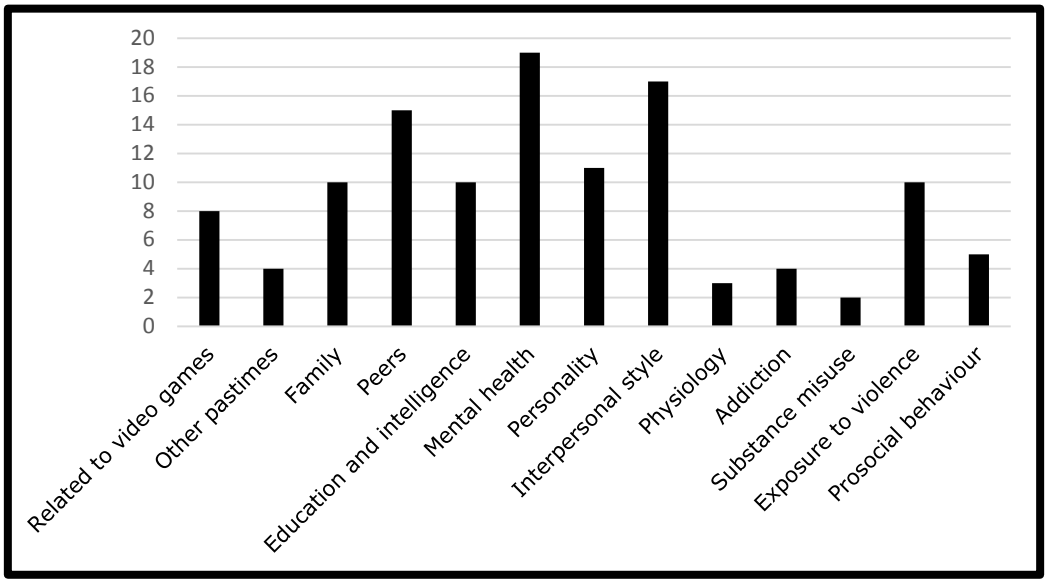


Figure 10: Summary of Additional Measures

2.3.3.2.1. **Related to Video Games**

Eight studies (13%) included measures relating to VGs, which included attractiveness of features of VGs (Nije Bijvank, Konijn, Bushman, & Roelofsma, 2009), motivations for playing (Colwell & Kato, 2005; Moyer, 2008; Nije Bijvank, Konijn, & Bushman, 2012), perceived side effects of VGs (Allahverdipour, Bazargan, Farhadinasab, & Moeini, 2010), social context for gameplay (Hastings et al., 2009), and parental involvement (Coyne, Padilla-Walker, Stockdale, & Day, 2011; Ferguson & Olson, 2014; Ferguson et al., 2014; Hastings et al., 2009; Holtz & Appel, 2011). Only seven studies included reported outcomes relevant for this review. The quality of the studies was mixed, with five studies having a low risk of bias (scoring from 1-2) and two studies having a slightly higher risk of bias (score of 3). A summary of the studies is presented in Table 3.

Table 3: Studies That Included Additional Measures Related to Video Games

Researchers	n	Sample	Measure	Relationship with Aggression	Risk of Bias Score**
Nije Bijvank, Konijn and Bushman (2012)	830	Child	Motivations (B)	Not significant	1
Moyer (2008)	195	School	Motivations (V)	Preferring VGs to friends (male only), dominance, agency, and social status motivations associated with increased aggression (male only)	2
Allahverdipour, Bazargan, Farhadinasab and Moeini (2010)	444	School	Perceived side effects of VGs (B)	Not significant	1
Coyne et al. (2011)	287	Children and their families*	Co-Playing (B)	Lower aggression reported in females who co-played with parents	1
Ferguson and Olson (2014)	377	School	Parental Involvement (B)	Not significant	2
Ferguson et al., (2014)	1254	School	Parental Involvement (B)	Not significant	3
Holtz and Appel (2011)	205	School	Parental Involvement (B)	Parental involvement associated with lower aggression	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=Previously validated measure

2.3.3.2.2. Motivations for playing VGs were not associated with aggression in one study (Nije Bijvank, Konijn, & Bushman, 2012), but in another which used a previously validated measure of motivations for playing (Videogame Questionnaire, Barnett et al., 1997), some forms were significantly associated with increased aggression for male participants (Moyer, 2008), highlighting the importance of gender differences. Where a significant effect was found, parental involvement in VG play was considered to be associated with lower levels of aggression in two studies, with co-playing being associated with lower aggression in females (Coyne et al., 2011), and parental knowledge being associated with lower levels of rule-breaking and aggression. The other three studies did not find a significant relationship with externalising behaviour. Taken together, these results highlight the importance of motivations for VG play in understanding possible links with aggression, as well as emphasising the mediating effect of parental involvements.

2.3.3.3. **Other Pastimes**

2.3.3.3.1. Four studies (6%) included measures relating to participants other pastimes, which included internet use (Holtz & Appel, 2011), exposure to TV violence (Ferguson et al., 2008), involvement in extracurricular activities (Ferguson et al., 2014), and other activities generally (Müller et al., 2015). The quality of the studies was good, with two studies having a low risk of bias (score of 2) and the other two having a medium risk (score of 3). A summary of the studies is presented in Table 4.

Table 4: Studies That Included Additional Measures Related to Other Pastimes

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Holtz and Appel (2011)	205	School	Internet Use (B)	Positive association for amount of internet use and playing action or fantasy games, and positive association with amount and using it for communication and online games. No relationship with first-person shooters	Higher aggression scores reported for those who used the internet more and who used it for communication. No association with using it for information purposes.	3
Ferguson et al. (2008)	355	Student	TV Violence Exposure (B)	Positive association for increased exposure to TV violence and VGs	Not significant	3
Ferguson et al., (2014)	1254	School	Involvement extracurricular activities (V)	Not significant	Not significant	3
Müller et al. (2015)	12938	School	Involvement in other activities (V)	Involvement in other activities negatively associated with VG exposure	Not reported	2

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.3.2. Internet use was found to be positively associated with the amount VGs were played, and a preference for both fantasy and online VGs. Amount and content of internet use were positively associated with increased aggression and rule-breaking behaviour. For TV violence, a positive association was found with VG use, but no link with increased aggression. One study found that engagement in other activities was unrelated to VGs or externalising behaviour (Ferguson et al., 2014). However, a different study using a subscale from the CBCL found that involvement in other activities was negatively related to involvement in (Müller et al., 2015). Overall these findings suggest that other media use is often found in individuals who play VGs and is perhaps more likely than other more traditional activities or hobbies.

2.3.3.4. **Family**

2.3.3.4.1. Ten studies (16%) included measures relating to family, which included relationships with family (Ferguson, 2011b; Ferguson et al., 2008; Ferguson, Garza, Jerabeck, Ramos, & Galindo, 2013; Ferguson, San Miguel, Garza, & Jerabeck, 2012; Ferguson, San Miguel, & Hartley, 2009), family environment (Ferguson, 2011b; Ferguson, San Miguel, & Hartley, 2009), parental depression (Ferguson et al., 2013), parental involvement (DeCamp, 2015; Glascock, 2014) (Ferguson et al., 2013), and family affluence (Janssen, Boyce, & Pickett, 2012). Only seven studies included reported outcomes relevant for this review. The studies were mixed in terms of quality, with three having a low risk of bias (score of 1-

2), three with a medium risk of bias (score of 3-4), and one having a high risk of bias (score of 5). A summary of the studies is presented in Table 5.

Table 5: Studies That Included Additional Measures Related to Family

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Ferguson (2011b)	302	Child	Family attachment (V)	Not reported	Negatively associated with violent crime	1
Ferguson et al. (2013)	333	Child / Adolescent	Family attachment (V)	Not reported	Negatively associated with aggression and bullying	2
Ferguson et al. (2012)	165	Child	Family attachment (V)	Not reported	Not significant	2
Ferguson et al. (2008)	355	Student	Parental affection (B)	Not significant	Not significant	3
Ferguson, San Miguel and Hartley (2009)	603	Child	Negative Relationships with adults (V)	Positive	Positively associated with aggression, bullying and delinquency	3
Ferguson (2011b)	302	Child	Negative Relationships with adults (V)	Not reported	Not significant	1
Ferguson (2011b)	302	Child	Family environment (V)	Not reported	Not significant	1
Ferguson, San Miguel and Hartley (2009)	603	Child	Family environment (V)	Not significantly related	Negative relationship with aggression	3
Ferguson et al. (2013)	333	Child / Adolescent	Parental Supervision (B)	Not reported	Parental supervision negatively associated with delinquency	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Ferguson et al. (2013)	333	Child / Adolescent	Parental Depression (V)	Not reported	Positively associated with rule-breaking behaviour	2
DeCamp (2015)	6122	School	Parental Influence (B)	Not reported	Males with higher parental influence less likely to carry a weapon. Females with higher parental influence less likely to hit others or carry a weapon	5
Glascock (2014)	400	Student	Parental Influence (M)	Not reported	Greater negative parental influence associated with higher aggression	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.4.2. Family relationship was measured in four studies (Ferguson, 2011b; Ferguson et al., 2013; Ferguson et al., 2012; Ferguson, San Miguel, & Hartley, 2009) as measured by the Family Attachment subscale of the Negative Life Events questionnaire (Paternoster & Mazerolle, 1994). However, none of them reported the relationship with VGs. One study that did explore family relationships and VG exposure was Ferguson et al. (2008), where they measured levels of parental affection and found there was no significant relationship. In all but one case, each of the studies reported results for aggression measures. Two studies found family attachment to be negatively associated with aggression, with one finding lower levels of self-report involvement in violent crime (Ferguson, 2011b), and the other finding lower levels of aggression and bullying behaviour (Ferguson et al., 2013). However, Ferguson et al. (2012) found no relationship between family attachment and aggression. Only one study reported results looking at negative family relationships and VG exposure. In their study, Ferguson, San Miguel & Hartley (2009) found that those who reported having negative relationships with their parents (as measured by the Negative Relationships with Adults subscale of the Negative Life Events questionnaire) reported greater VG use.

2.3.3.4.3. Two studies explored children's views of their family environment generally (as measured by the Family Environment Scale, Moos & Moos, 2002), however only one study reported relevant findings, showing it to be unrelated to VG exposure and linked to lower levels

of aggression (Ferguson, San Miguel, & Hartley, 2009). One study explored the impact of parental experiences of depression (as measured by the Beck Depression Inventory, Beck, Steer, & Brown, 1996) and while they did not report results for VG exposure, they did find that it was linked to increased levels of rule-breaking behaviour in children. Linked to this, studies that explored parental supervision, while they did not report findings associated with VG use, it was found to be associated with aggression, with positive parental influence found to reduce self-reported violent behaviour, particularly for girls (DeCamp, 2015), and negative influence being associated with higher levels of verbal aggression (Glascock, 2014).

2.3.3.4.4. Based on the earlier findings relating to family involvement in media use and lower levels of aggression, it could be hypothesised that positive family experiences (including attachment, family environment, supervision, and influence may also be associated with lower reported ill-effects from VG exposure. However, the lack of reporting of results related to this makes it difficult to explore in more detail.

2.3.3.5. **Peers**

2.3.3.5.1. Fifteen studies (24%) included measures relating to peer delinquency (Exelmans, Custers, & Van den Bulck, 2015; Ferguson, 2011b; Ferguson et al., 2012; Ferguson et al., 2013; Ferguson, San Miguel, & Hartley, 2009; Glascock, 2014), social competency (Choo et al., 2010; Moyer, 2008; Müller et al., 2015), social problems

(Exelmans, Custers, & Van den Bulck, 2015; Leiner et al., 2014; Müller et al., 2015), and social support (Breuer, Festl, & Quandt, 2014; Ferguson & Olson, 2014; Ferguson et al., 2014). Only thirteen studies included reported outcomes relevant for this review. The quality of studies was mixed, with eight studies having a low risk of bias, and five studies having a medium risk of bias. A summary of the studies is presented in Table 6.

Table 6: Studies That Included Additional Measures Related to Peers

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Exelmans, Custers and Van den Bulck (2015)	3372	Adolescent	Delinquent Peers (B)	Associated with increased exposure generally and for violent games	Increased levels of aggression	4
Ferguson (2011b)	302	Child	Delinquent Peers (V)	Not reported	Not significant	1
Ferguson et al. (2012)	165	Child	Delinquent Peers (V)	Not reported	Not significant	2
Ferguson et al. (2013)	333	Child / Adolescent	Delinquent Peers (V)	Not reported	Increased reported bullying	2
Ferguson, San Miguel and Hartley (2009)	603	Child	Delinquent Peers (V)	Increased exposure to VGs	Increased levels of aggression, delinquency, and bullying	3
Glascock (2014)	400	Undergraduate	Delinquent Peers (V)	Not reported	Increased levels of aggression	3
Choo et al. (2010)	2998	School	Social competency (V)	Not significant	Not reported	3
Moyer (2008)	195	School	Social Competency (V)	Lower levels of VG play associated with higher levels of social competency in females only No significant difference for preference for VVGs	Not significant	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Müller et al. (2015)	12938	School	Social Competency (V)	Lower levels of exposure	Not reported	2
Moyer (2008)	195	School	Positive Social Adjustment (V)	Lower levels of playing for males only Increased level of VVGs played for females, lower for males	Not significant	2
Exelmans, Custers and Van den Bulck (2015)	3372	Adolescent	Alienation (P)	Associated with increased exposure generally and violent games	Increased levels of aggression	4
Leiner et al. (2014)	579	Child*	Social Problems (V)	Not significant	Not reported	2
Müller et al. (2015)	12938	School	Social Problems (V)	Higher levels of social problems associated with those who meet the criteria for Internet Gaming Disorder, more than those deemed to be at risk, not at risk or non-gamers	Not reported	2
Moyer (2008)	195	School	Negative Social Adjustment (V)	Not significant	Increased levels of aggression	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Bruer, Festl and Quandt (2014)	4500	Mixed*	Social Support (V)	Lower levels of VG play for adolescent and older adult participants. No significant relationship with young adults	Lower levels of physical aggression for older adults Increased levels of verbal aggression for all ages	2
Ferguson and Olson (2014)	377	School	Social Support (A)	Not reported	Not significant	2
Ferguson et al., (2014)	1254	School	Social Support (A)	Not significant	Lower levels of delinquency and anger	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.5.2. Associating with delinquent peers was found to be associated with increased levels of VG playing generally (Exelmans, Custers, & Van den Bulck, 2015; Ferguson, San Miguel, & Hartley, 2009), and playing VVGs (Exelmans, Custers, & Van den Bulck, 2015). In both instances, these studies referred to child or adolescent samples, and so may not be generalisable to adult players. It was also found to linked to increased levels of aggression in cross-sectional studies (Exelmans, Custers, & Van den Bulck, 2015; Ferguson et al., 2013; Ferguson, San Miguel, & Hartley, 2009; Glascock, 2014) but not all in longitudinal (Ferguson, 2011b; Ferguson et al., 2012) suggesting that delinquent peers may be associated with increased aggression during certain time points of a child and adolescents life.

2.3.3.5.3. Social competency was found to have either a negative (Moyer, 2008; Müller et al., 2015) or no relationship (Choo et al., 2010) with VGs, suggesting that children (all studies were conducted using school samples) which higher levels of social competency were less likely to play VGs than peers with lower levels of social competency. In Moyer's (2008) study it was found that lower levels of social competency in female players was associated with increased VG play and that difficulties associated with social adjustment were associated with increased VG play in males (Moyer, 2008). Similar findings were also reported by Exelmans, Custer and Van den Bulck (2015), whereby reported feelings of alienation were associated with increased VG play. The results of these studies highlight that levels of social competency were

associated with VG play, in that individuals with lower social skills were more likely to play VGs. However, Müller et al. (2015) found that difficulties with social problems were found in participant's who met the criteria for Internet Gaming Disorder, highlighting that problematic use may be more relevant than excessive use when exploring the relationship between playing VGs and social problems. It is also of note that in those studies that reported it, measures relating to social competency were also linked to aggressive behaviour, in that lower levels of social skills were found to be associated with increased aggression (Exelmans, Custers, & Van den Bulck, 2015; Moyer, 2008).

2.3.3.5.4. Three studies explored the role of social support, with one study finding no significant relationship (Ferguson et al., 2014), and another finding mixed results depending on participant age (Breuer, Festl, & Quandt, 2014). Bruer, Festl and Quandt (2014) in their large-scale study focusing on participants who reported playing VGs found that lower levels of social support were associated with increase VG playing in both adolescent and older adult participants. Externalising behaviour and social support were found to have a negative correlation for physical aggression (older adults only), and increased verbal aggression (Breuer, Festl, & Quandt, 2014). However, this finding was not supported by the other studies that found no relationship (Ferguson & Olson, 2014), or decreased levels of externalising behaviour (delinquency and anger, Ferguson et al., 2014).

2.3.3.5.5. In summary, the studies highlight evidence for poor social skills and support being linked to increased levels of both VG play and subsequent aggressive behaviour. However, there is evidence to suggest that this is dependent on gender, age, and problematic levels of VG play.

2.3.3.6. **Education and Intelligence**

2.3.3.6.1. Ten studies (16%) included measures relating to education and intelligence which cognitive ability (Choo et al., 2010; Ferguson et al., 2013; Valadez & Ferguson, 2012), academic achievement (Breuer, Festl, & Quandt, 2014; Breuer, Vogelgesang, Quandt, & Festl, 2015; Nije Bijvank, Konijn, & Bushman, 2012), reading and spelling ability (Ferguson et al., 2013), education ability (Boxer, Huesmann, Bushman, O'Brien, & Moceri, 2009; Hastings et al., 2009; Müller et al., 2015), and value of education (Ferguson et al., 2008). The quality of studies was mixed, with four having a low risk of bias, three rated as a medium risk, and three rated as a high risk of bias. A summary of the studies is presented in Table 7.

Table 7: Studies That Included Additional Measures Related to Education and Intelligence

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Choo et al. (2010)	2998	School	General Ability (V)	Not significant	Not reported	3
Ferguson et al. (2013)	333	Child/ Adolescent	Cognitive Ability (V)	Not significant	Not reported	2
Valadez and Ferguson (2012)	100	Student	Cognitive Ability (V)	Not significant	Not reported	4
Breuer, Vogelgesang, Quandt and Festl (2015)	276	Mixed*	Level of Education (B)	Not significant	Lower education level associated with increased aggression	5
Breuer, Festl and Quandt (2014)	4500	Mixed*	Level of Education (B)	Lower education related to increased levels of VG play	Lower education associated with increased physical aggression for all ages Increased anger in young adults only Increased verbal aggression in young and older adults	6

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Nije Bijvank, Konijn and Bushman (2012)	830	Child*	Level of Education (B)	Not significant	Lower education related to increased aggression	1
Boxer et al. (2009)	820	Adolescent	Academic Skills (V)	Not significant	Lower ability associated with higher aggression	5
Ferguson et al. (2013)	333	Child/ Adolescent	Academic Skills (V)	Not significant	Not reported	2
Hastings et al. (2009)	70	Children and Parents	Academic Performance (V)	Lower performance associated with increased playing (boys only) Exposure to VVGs associated with lower school competence	Not reported	2
Müller et al. (2015)	12938	School	Academic Performance (V)	Lower performance associated with higher VG use	Not reported	2
Hastings et al. (2009)	70	Children and Parents	School Performance (B)	Lower school performance associated with increased VVG exposure	Not reported	2
Ferguson et al. (2008)	355	Student	Education Value (B)	Not significant	Not significant	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.6.2. Intelligence was measured by either cognitive (Ferguson et al., 2013; Valadez & Ferguson, 2012) or general ability (Choo et al., 2010). All the measures were previously validated measures, with the cognitive measures being the Kaufman Brief Intelligence Task (Kaufman & Kaufman, 2004), and the general ability measure being Raven's Standard Progressive Matrices (Raven, Styles, & Raven, 1998). All of the studies reported no significant findings in relation to VG play, either following short-term exposure as part of the study (Valadez & Ferguson, 2012) or when measured as a self-report exposure (Choo et al., 2010; Ferguson et al., 2013).

2.3.3.6.3. Participant's level of education (e.g. what their education status was, or their highest level of qualification) was found to be not significantly related to VG use in two studies (Breuer, Festl, & Quandt, 2014; Nije Bijvank, Konijn, & Bushman, 2012). However, a third found that lower education was related to increased levels of VG use (Breuer, Festl, & Quandt, 2014). In all studies, lower education level was related to increased aggression, although this varied depending on participant age in one study (Breuer, Festl, & Quandt, 2014).

2.3.3.6.4. In relation to current academic skills, measured by the Wide Range Achievement Test (Wilkinson 1993) which explores reading, writing and mathematical ability, both studies that explored this found no significant relationship with VG play (Boxer et al., 2009; Ferguson et al., 2013). Measured more generally, lower school performance

(as measured by the Childhood Behaviour Checklist) was found in three studies to be associated with increased VG use (Hastings et al., 2009; Müller et al., 2015). Although, Hastings et al. (2009) found that using a validated measure (the CBCL) this was only for boys, as well as observing a link between lower school performance and a preference for VVGs.

2.3.3.6.5. The results suggest that VG play may be related to lower academic performance in children and adolescents, which could be hypothesised to be related to a preference to playing games over completing homework / engaging in school work. However, studies that used adult samples found mixed evidence for VG use and education level, suggesting that it may not be a long-term effect on a person's ability to achieve academically, which is also in line with studies that looked at intelligence level which found no evidence for a difference in intelligence and VG exposure.

2.3.3.7. **Mental Health**

2.3.3.7.1. 21 studies (34%) included measures relating to mental health, which included depression (Ferguson, 2011a; Ferguson, Colwell, Mlačić, Milas, & Mikloušić, 2011; Ferguson et al., 2013; Ferguson & Olson, 2014; Ferguson & Rueda, 2010; Ferguson et al., 2012; Valadez & Ferguson, 2012), internalising problems (Coyne et al., 2011; Holtz & Appel, 2011; Leiner et al., 2014; Müller et al., 2015; Valadez & Ferguson, 2012), psychoticism (Boxer et al., 2009), thought problems (Leiner et al., 2014; Müller et al., 2015), affect

(Breuer, Scharkow, & Quandt, 2015; Mahood & Hanus, 2017), catharsis seeking (Ferguson et al., 2014), attention problems, (Ferguson & Olson, 2014; Hastings et al., 2009; Leiner et al., 2014; Müller et al., 2015) self-control (You, Kim, & No, 2015), stress (Ferguson & Olson, 2014; Ferguson et al., 2014; Mihan, Anisimowicz, & Nicki, 2015), general mental health (Allahverdipour, Bazargan, Farhadinasab, & Moeini, 2010), damages in functioning (Choo et al., 2010) and life satisfaction (Montag et al., 2011). Only 20 studies included reported outcomes relevant for this review. The quality of the studies was mixed, with 11 studies rated as a low risk of bias, eight as a medium risk of bias, and one as a high risk of bias. A summary of the studies is presented in Table 8.

Table 8: Studies That Included Additional Measures Related to Mental Health

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Ferguson and Rueda (2010)	103	Undergraduate	Depression (V)	Not significant	Higher depression scores linked to higher trait aggression	5
Valadez and Ferguson (2012)	100	Undergraduate	Depression (V)	Not significant	Not reported	4
Ferguson (2011b)	302	Child	Depression (V)	Not reported	Higher depression scores linked to increased aggression, rule-breaking, and bullying	1
Ferguson et al. (2013)	333	Child/Adolescent	Depression (V)	Not significant	Higher depression linked to increased aggression and rule breaking	2
Ferguson et al. (2012)	165	Child	Depression (V)	Not reported	Higher depression scores associated with higher self-report aggression	2
Ferguson et al. (2011)	837	Undergraduate	Depression (V)	Not significant	Not Reported	3
Ferguson, San Miguel and Hartley (2009)	603	Child	Depression (V)	Not significant	Higher depression scores associated with increased aggression, delinquency, and bullying	3
Coyne et al. (2011)	287	Children and their families*	Internalising Behaviour (P)	Higher levels of internalising behaviour	Higher internalising behaviour associated with	1

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
				associated with playing age-inappropriate games for females Higher levels of internalising behaviour associated with higher VG exposure for males Co-playing associated with lower levels of internalising behaviours in females	higher self-report of aggression in children	
Holtz and Appel (2011)	205	School	Internalising Problems (V)	Increased internalising problems associated with preference for fantasy and online VGs	Increased internalising problems associated with increased aggression	3
Leiner et al. (2014)	579	Child*	Internalising Problems (V)	Higher internalising problems associated with more aggressive games compared to non	Not reported	2
Müller et al. (2015)	12938	School	Internalising Problems (V)	Internet Gaming Disorder linked to higher internalising problems	Not reported	2
Leiner et al.	579	Child*	Thought	Increased thought	Not reported	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
(2014)			Problems (V)	problems higher in those who played aggressive games vs non-aggressive		
Müller et al. (2015)	12938	School	Thought Problems (V)	Higher thought problems associated with internet gaming disorder, with higher levels reported	Not reported	2
Mahood and Hanus (2017)	184	Undergraduate	Affect (V)	Negative affect higher if given instruction to act immorally in game vs no instruction.	Not reported	3
Breuer, Scharkow and Quandt (2015)	76	Undergraduate	Affect (P)	Higher experience of anger if lost compared to winning Higher experience of shame if lost compared to winning	Higher levels of aggression linked to higher anger and frustration scores	2
Ferguson et al. (2014)	1254	School	Catharsis seeking (B)	Higher catharsis seeking associated with increased preference for VVG	Not significant	3
Ferguson and Olson (2014)	377	School	ADD (V)	Not reported	ADD diagnosis linked to bullying behaviour	2
Hastings et al. (2009)	70	Children and Parents	Attention Problems (V)	Higher levels of attention problems associated with	Not reported	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
				higher number of violent games played and exposure to violent games		
Leiner et al. (2014)	579	Child*	Attention Problems (V)	Not significant	Not reported	2
Müller et al. (2015)	12938	School	Attention Problems (V)	Internet Gaming Disorder linked to higher attention problems	Not reported	2
You, Kim and No (2015)	1242	School	Self-Control (P)	Lower self-control associated with higher levels of VG play	Lower self-control associated with increased aggression	3
Ferguson and Olson (2014)	377	School	Stress (V)	Not reported	Increased stress related to bullying in depressed sample Increased stress related to delinquency for both ADD and depressed sample	2
Ferguson et al. (2014)	1254	School	Stress (V)	Not significant	Higher reported stress associated with increased aggression	3

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Allahverdipour et al. (2010)	444	School	Mental Health Status (V)	Young initiation age associated with increased mental health complaints Years played associated with lower mental health complaints	Higher levels of mental health complaints associated with increased aggression	1
Choo et al. (2010)	2998	School	Damage in Functioning (P)	Not significant	Not reported	3
Montag et al. (2011)	610	Mixed*	Life Satisfaction (P)	Lower satisfaction with life associated with increased VG play	Lower satisfaction with life associated with increased aggression	1

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.7.2. Five of the included studies explored the relationship between VG use and depression (as measured by the Beck Depression Inventory (Beck, Steer, & Brown, 1996), or as part of the Childhood Behaviour Checklist (Achenbach, 1991), or the Zung Depression Inventory (Zung, 1965)), and all found no significant relationship. Studies which explored low mood and stress more generally (termed "internalising problems"), did find a link, with higher levels of difficulties associated with increased VG use. Similarly, studies which looked at experiences of thought difficulties (as measured by the CBCL) also found links with VGs, with one finding greater experiences of thought problems associated with pathological game playing (Müller et al., 2015), and another finding an association with an increased preference for violent content (Leiner et al., 2014). The difference between the studies that involved clinical measures and more general measures suggests that increased VG use may be associated with subclinical difficulties, or that the inclusion of items related to stress and worry may be more associated with VG use. In all the studies that reported findings, each found a significant relationship with both increased depression and internalising problems associated with increased aggression.

2.3.3.7.3. In addition to this, three studies explored the impact of VG playing on mood. Breuer, Sharkow and Quandt (2015) focused on exploring the effects of gameplay on negative mood states, including anger, irritation, feelings of shame, and frustration. They found that both anger and feelings of shame were associated with losing a

competitive VG and argued that negative affect may be associated with negative outcomes of gameplay rather than due to the content of what had been played. Similarly, Mahood and Hanus (2017) found that negative affect was associated with how players had been told to act in a free choice VG, with players who had been told to play in an immoral, compared to those who had been given no instructions as to how to play the particular level of the game. While these two studies may highlight the role VGs can have on mood states, Ferguson and colleagues (2014) explored whether players who wished to alter their mood state were more inclined to prefer specific types of games. They found that those who reported higher levels of catharsis seeking preferred more VVGs, however, they note that there was no association with higher levels of aggression. This suggests that while VGs may be associated with altered mood states, with negative moods associated with more negative content in the games (e.g. losing, having to do things we may not otherwise choose to do), and violent content may help to improve our mood in a more acceptable manner than acting aggressively.

2.3.3.7.4. Difficulties associated with attention and impulse control have also been explored in VG players. Two studies found links between increased attention problems and an increased preference for VVGs (Hastings et al., 2009), and potentially problematic VG use (Müller et al., 2015). While another study looked at a diagnosis of Attention Deficit Disorder (Ferguson & Olson, 2014), it did not include a

measure of VG playing as the aim of the study was to look at the impact of VG playing on vulnerable populations (those with a diagnosis of ADD or depression). Self-control was also explored in another study, which found no relationship with VG playing but did observe increased reporting of aggression in those who also reported lower levels of self-control. Similarly, Ferguson and Olson (2014) found that a diagnosis of ADD was related to higher self-report of bullying others, suggesting that difficulties associated with attention and impulse control are associated with increased aggression, but not necessarily involved in higher VG use.

2.3.3.7.5. In relation to general mental health and wellbeing, Allahverdipour, Bazargan, Farhadinasab and Moeini (2010) found that increased levels of difficulties reported were associated with VG play, but interestingly it was related to being new to the medium, suggesting that a background in VG playing is not necessarily associated with poor mental health. Similarly, reported difficulties in functioning was not associated with VG play (Choo et al., 2010). However, lower levels of satisfaction with life were associated with increased VG playing (Montag et al., 2011), suggesting that VGs may be used as a coping strategy, which links to the earlier reported findings in relation to mood.

2.3.3.8. **Personality**

2.3.3.8.1. 11 studies (18%) included measures relating to personality, which included general (Boxer et al., 2009; Ferguson et al., 2011;

Ferguson et al., 2008; Greitemeyer, 2015; Montag et al., 2011; Sigurdsson, Gudjonsson, Bragason, Kristjansdottir, & Sigfusdottir, 2006) and negative personality styles (Boxer et al., 2009; Ferguson, 2011b; Ferguson et al., 2013; Ferguson et al., 2012; Ferguson, San Miguel, & Hartley, 2009; Greitemeyer, 2015). The quality of studies was mixed, with five studies rated as a low risk of bias, four rated as medium, and two rated as high. A summary of the studies is presented in Table 9.

Table 9: Studies That Included Additional Measures Related to Personality

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Boxer et al. (2009)	820	Adolescent	Personality (V)	Not significant	Higher levels of psychoticism associated with increased aggression	5
Ferguson et al. (2011)	837	Undergraduate	Personality (V)	Not reported	Low agreeableness associated with increased aggression in English participants Low neuroticism associated with increased aggression in Croatian participants	3
Ferguson et al. (2008)	355	Undergraduate	Personality (V)	Not significant	High neuroticism associated with increased aggression	3
Greitemeyer (2015) – study 1	225	Mixed	Personality (V)	Low agreeableness and conscientiousness associated with increased VVG play	Low agreeableness and conscientiousness associated with increased aggression	4
Greitemeyer (2015) – study 2	340	Mixed	Personality (V)	Low conscientiousness associated with increased preference for VVGs	High neuroticism associated with increased aggression Low agreeableness and conscientiousness associated with increased aggression	4

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
				High openness associated with increased preference for VVGs	High neuroticism associated with increased aggression	
Montag et al. (2011)	610	Mixed*	Personality (V)	Low extraversion, agreeableness, and conscientiousness associated with increased VG play	Low openness, agreeableness and conscientiousness associated with increased aggression	1
Sigurdsson et al. (2006)	433	Mixed	Personality (V)	Higher levels of psychoticism associated with increased levels of VVG play – higher than in non-violent or non-gaming participants	High neuroticism associated with increased aggression Not reported	2
Ferguson (2011b)	302	Child	Antisocial personality (V)	Not reported	Higher antisocial personality scores associated with higher bullying behaviour reported	1
Ferguson et al. (2013)	333	Child/ Adolescent	Antisocial Personality (V)	Not reported	Higher antisocial personality scores associated with higher rule breaking and	2

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
					bully behaviour reported	
Ferguson et al. (2012)	165	Child	Antisocial Personality (V)	Not reported	Not significant	2
Ferguson, San Miguel and Hartley (2009)	603	Child	Antisocial Personality	Higher levels of antisocial personality associated with increased VG exposure	Higher levels of antisocial personality associated with increased aggression, bullying and delinquency	3
Boxer et al. (2009)	820	Adolescent	Callous-unemotional traits (V)	Preference for VVGs as a child and as an adult associated with increased levels of callous-unemotional traits	Higher callous-unemotional traits associated with increased aggression	5
Greitemeyer (2015) – study 1	225	Mixed	Sadism (V)	High sadism (physical and verbal) associated with increased VG play	High sadism (physical and verbal) associated with both verbal and physical aggression	4
Greitemeyer (2015) – study 2	340	Mixed	Sadism (V)	High physical sadism associated with increased preference for VVGs	High sadism (physical and verbal) associated with both verbal and physical aggression	4
Greitemeyer (2015) – study 2	340	Mixed	Dark Triad (V)	High Machiavellianism and Psychopathy associated	Higher levels of narcissism, Machiavellianism, and	4

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
				with increased preference for VVGs	psychopathy associated with increased aggression	

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.8.2. General personality traits found to be associated with increased VG use included low agreeableness (Greitemeyer, 2015; Montag et al., 2011), low conscientiousness (Greitemeyer, 2015; Montag et al., 2011), and low extraversion (Montag et al., 2011). Of note, these traits (apart from extraversion) were also found to be associated with increased aggression (Ferguson et al., 2011; Greitemeyer, 2015; Montag et al., 2011), highlighting an overlap between personality styles that are associated with increased aggression, and preference for playing VGs. This suggests that those interested in playing VGs may also be aggressive because of their personality style, rather than the influence of the VG itself.

2.3.3.8.3. Antisocial personality was found to be associated with increased levels of VG use (Ferguson, San Miguel, & Hartley, 2009). Measures related to psychopathy were used in three studies (Boxer et al., 2009; DeLisi, Vaughn, Gentile, Anderson, & Shook, 2013; Greitemeyer, 2015) two of which found positive associations with use of VGs (Greitemeyer, 2015) and preference for VVGs (Boxer et al., 2009), while one found no relationship (DeLisi et al, 2013). Machiavellianism and neuroticism were also measured as part of the dark triad of personality in one study (Greitemeyer, 2015), with only Machiavellianism being positively associated with VGs use. Physical and verbal sadism was found to be associated with increased levels of VG use (Greitemeyer, 2015), with only verbal sadism was significant being linked to a preference for VVGs. Almost all the studies found these traits to be associated with

increased aggression. Taken together, the results suggest again that personality traits associated with increased aggression are also associated with increased VG use both generally and a preference for violent content, again highlighting that preference for VGs and aggression may co-occur rather than being linked to one another.

2.3.3.9. **Interpersonal Characteristics**

2.3.3.9.1. 19 studies (31%) included measures relating to interpersonal characteristics, which included empathy (Arriaga et al., 2015; Bartholow, Sestir, & Davis, 2005; Gentile, Li, Khoo, Prot, & Anderson, 2014; Jerabeck & Ferguson, 2013; Lemmens, Bushman, & Konijn, 2006; Sigurdsson et al., 2006; You, Kim, & No, 2015; Zhen, Xie, Zhang, Wang, & Li, 2011), impulsivity and self-control (Brady, 2007; Choo et al., 2010; DeCamp, 2015; Exelmans, Custers, & Van den Bulck, 2015; Montag et al., 2011; Nije Bijvank, Konijn, & Bushman, 2012), self-worth (Breuer, Festl, & Quandt, 2014; Colwell & Kato, 2005; Moyer, 2008), risk taking (Krcmar et al., 2015; Montag et al., 2011), and moral disengagement (Richmond & Wilson, 2008). Only 18 studies included reported outcomes relevant for this review. The quality of studies was mixed, with seven rated as low risk of bias, ten rated as a medium risk of bias, and one rated as a high risk of bias. A summary of the studies is presented in Table 10.

Table 10: Studies That Included Additional Measures Related to Interpersonal Characteristics

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Arriaga et al. (2015)	134	Undergraduate	Empathy (V)	Greater pupil dilatory response found in those who played violent vs non-violent games when viewing images of victims of violence.	those with lower PDR when viewing images of victims of crime were more aggressive	3
Bartholow, Bushman and Sestir (2006)	34	Undergraduate	Empathy (V)	Those who played a violent game had lower PDR when viewing violent images	Those who had lower PDR when viewing images of victims of crime were more likely to be aggressive	2
Gentile et al. (2014)	3034	School	Empathy (V)	Lower levels of empathy associated with increased VG play	Lower empathy associated with increased aggressive behaviour	2
Jerabeck and Ferguson (2013)	100	Undergraduate	Empathy (V)	Not significant	Not reported	4
Sigurdsson et al. (2006)	433	Mixed	Impulsivity, Venturesome, and Empathy (V)	Not significant	Not reported	2
You, Kim and No (2015)	1242	School	Empathy (P)	Higher empathy associated with increased VG playing	Not significant	3
Zhen et al. (2011)	795	School	Empathy (V)	Lower levels of empathy associated with increased VG play in all participants in	Lower empathy associated with increased physical aggression for	3

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
				Grade 5, and for female participants in Grade 8	males in Grade 11 Lower empathy associated with higher beliefs about aggression in Grade 5 and 8 females, and grade 11 males	
Richmond and Wilson (2008)	86	Student	Moral Disengagement (V)	Frequency and exposure to violent media associated with higher levels of moral disengagement	Not reported	3
You, Kim and No (2015)	1242	School	Emotion Regulation (P)	Not significant	Lower emotion regulation associated with increased aggression	3
Choo et al. (2010)	2998	School	Impulse Control Problems (V)	Not significant	Not reported	3
DeCamp (2015)	6122	School	Impulsivity / Self-Control (V)	Not reported	Increased impulsivity associated with increased self-report of hitting, and gun carrying in males Increased impulsivity associated with increased hitting, weapon carrying, and gun carrying in	5

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
					females	
Montag et al. (2011)	610	Mixed*	Impulsivity (V)	Not reported	Not Reported	1
Brady (2007)	319	Adult	Constrained Options for Solving Problems (P)	Lower problem solving associated with increased preference for sports VGs	Not reported	3
Exelmans, Custers and Van den Bulck (2015)	3372	Adolescent	Sensation Seeking (V)	Increased sensation seeking associated with higher levels of general VG play and increased VVG play Lower sensation seeking associated with higher levels of non-VVG play	Higher levels of sensation seeking associated with increased aggression	4
Krcmar et al. (2015)	200	Undergraduate	Risk Taking (V)	Not reported	Before and after gameplay those deemed risk avoiders were lower in aggression	2
Montag et al. (2011)	610	Mixed*	Self-Directedness (V)	Lower self-directedness associated with VG play	Lower self-directedness associated with increased aggression	1

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Breuer, Festl and Quandt (2014)	4500	Mixed*	Self-Efficacy (P)	Not significant	Lower levels of self-efficacy associated with increased anger in young and older adults Lower levels of self-efficacy associated with verbal aggression in all age groups	2
Colwell and Kato (2005)	509	School	Self-Esteem (V)	Lower self-esteem associated with higher frequency of VG play in UK participants only	Not reported	3
Moyer (2008)	195	School	Self-Esteem (V)	Lower self-esteem associated with increased VG play for males only	Lower self-esteem associated with increased aggression in males only	2

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.9.2. The association between empathy and VG playing varied depending on the method used to measure it. Two studies that used pupil dilatory responses found mixed results, with one showing lower responses to upsetting images following VG play (suggestive of desensitisation) (Bartholow, Bushman, & Sestir, 2006), while the other found higher (Arriaga et al., 2015). Similarly, self-report measures of empathy also had mixed findings, with full measures finding lower levels of empathy associated with increased VG playing (Gentile et al., 2014; Zhen, Xie, Zhang, Wang, & Li, 2011), and one study that used a partial measure found higher levels associated with VG play (Lemmens, Bushman, & Konijn, 2006), and two finding no relationship (Jerabeck & Ferguson, 2013; Sigurdsson et al., 2006). This suggests that the method of measuring empathy can alter the observed effect, highlighting the complexity of understanding empathy. Studies that reported links with aggression were more consistent, with lower levels of empathy associated with increased aggression (Arriaga et al., 2015; Bartholow, Bushman, & Sestir, 2006; Gentile et al., 2014; Zhen, Xie, Zhang, Wang, & Li, 2011).

2.3.3.9.3. Difficulties relating to lower problem-solving abilities and sensation seeking was found to be associated with increased VG use. Brady (2007) examined different preferences for VGs alongside problem-solving ability and only found difficulties associated with sports-themed games, rather than those associated with the more violent content. Sensation seeking was explored in two studies, however

only one reported its links to VGs finding increased sensation seeking associated with both general and VVG use, whereas low sensation seeking was associated with non-VVG use. In all the studies that reported it, higher impulsivity, low problem solving, and increased sensation seeking were all associated with increased aggression. However, the results of Krcmar et al. (2015) suggests that an individual's risk-taking potential may mediate their aggressive responses following VVG exposure, with those deemed "risk avoiders" being lower in aggression after playing a VVG.

2.3.3.9.4. Self-efficacy was found to be unrelated to VG use and negatively associated with externalising behaviour (Breuer, Festl, & Quandt, 2014). Lower levels of self-esteem were associated with frequency of VG use (Colwell & Kato, 2005; Moyer, 2008). However, the result was only present for part of the sample in both studies (UK (rather than Japanese or the full sample) for Colwell and Kato (2005), and only male participants in Moyer (2008)). This suggests that those who feel less positive about themselves may be more inclined to play VGs, which is in line with the result found in relation to mental health, particularly internalising behaviours related to low mood.

2.3.3.10. **Physiology**

2.3.3.10.1. Three studies (5%) included measures relating to physiology, which included measures of arousal (Adachi & Willoughby, 2011; Arriaga et al., 2015) and somatic complaints (Choo et al., 2010). Only two studies included reported outcomes relevant for this review, one of

which was rated as a low risk of bias, and the other as medium. A summary of the studies is presented in Table 11.

Table 11: Studies That Included Additional Measures Related to Physiology

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Adachi and Willoughby (2011) – Study 2	60	Undergraduate	Arousal	Increased heart rate associated with playing competitive vs non-competitive games	Not reported	1
Choo et al. (2010)	2998	School	Somatic Complaints (V)	Not significant	Not reported	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.10.2. For measures of arousal hear rate (Adachi & Willoughby, 2011) and skin conductance (Arriaga et al., 2015) were both used as biological measures of the effects of VGs on players. Only one study reported the relationship between VG play (Adachi & Willoughby, 2011) and found that differences in the level of competition were responsible for changes in heart rate rather than violent content. Somatic complaints were not associated with VG use (Choo et al., 2010) and were included as part of measures exploring the effects of pathological VG playing.

2.3.3.11. **Addiction**

2.3.3.11.1. Four studies (6%) included measures relating to addiction, which internet (Mihan, Anisimowicz, & Nicki, 2015; Montag et al., 2011) and gaming (Choo et al., 2010; Lemmens, Valkenburg, & Peter, 2011). Only two studies included reported outcomes relevant for this review, both of which were rated as a low risk of bias. A summary of the studies is presented in Table 12.

Table 12: Studies That Included Additional Measures Related to Addiction

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Montag et al. (2011)	610	Mixed*	Internet Addiction (V)	Higher internet addiction scores associated with increased levels of VG paly	Higher internet addiction scores associated with increased aggression	1
Lemmens, Valkenburg and Peter (2011)	530	Child/ Adolescent*	Pathological gaming (V)	n/a	Increased pathological gaming associated with increased aggression and T1 and T2	1

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.11.2. Internet addiction was measured in two studies (Mihan, Anisimowicz, & Nicki, 2015; Montag et al., 2011), however only one reported relevant results, finding that higher internet addiction scores were associated with both increased VG play and aggression. Increased aggression was also found in studies looking at pathological gaming (Choo et al., 2010; Lemmens, Valkenburg, & Peter, 2011), suggesting that problematic VG use and aggression may be associated.

2.3.3.12. **Substance Misuse**

2.3.3.12.1. Two studies (3%) included measures relating to substance misuse, both of which looked at both alcohol and drug use. Both studies were rated as a medium risk of bias. A summary of the studies is presented in Table 13.

Table 13: Studies That Included Additional Measures Related to Substance Misuse

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Ferguson et al. (2008)	355	Undergraduate	Alcohol and drug use (B)	Not significant	Not significant	3
Gunter and Daly (2012)	6567	School	Alcohol and drug use (B)	Higher levels of substance misuse reported in those who reported playing M rated games Marijuana use higher in boys who played M rated games compared to those who did not.	Not reported	4

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.12.2. Only one study found significant results relating to VGs, with higher substance misuse reported in those who played M rated games, with marijuana use higher for boys who played M rated games than those who did not, highlighting the importance of gender differences in both VG use and substance misuse.

2.3.3.13. **Exposure to Violence**

2.3.3.13.1. Eleven studies (18%) included measures relating to exposure to violence, which included general violence exposure (Boxer et al., 2009; DeCamp, 2015) , neighbourhood problems (Boxer et al., 2009; Brady, 2007; Ferguson, 2011a; Ferguson et al., 2012; Ferguson, San Miguel, & Hartley, 2009), family violence (Ferguson, 2011b; Ferguson et al., 2008; Ferguson et al., 2013; Ferguson et al., 2012; Ferguson, San Miguel, & Hartley, 2009), and experience of bullying (Exelmans, Custers, & Van den Bulck, 2015; Yang, 2012). Only ten studies included reported outcomes relevant for this review. The quality of the studies included was mixed, with four studies rated as low risk, four rated as medium risk, and two rated as high risk of bias. A summary of the studies is presented in Table 14.

Table 14: Studies That Included Additional Measures Related to Exposure to Violence

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Boxer et al. (2009)	820	Adolescent	Exposure to low-level aggression (V)	Exposure associated with preference for violent media both as a child and at present	Exposure associated with increased aggression as a child and at present	5
DeCamp (2015)	6122	School	Exposure to violence (B)	Not reported	Previous exposure to violence associated with increased reporting of hitting and gun carrying in males, and hitting, weapon carrying, and gun carrying in females	5
Boxer et al. (2009)	820	Adolescent	Neighbourhood problems (V)	Exposure associated with preference for violent media both as a child and at present	Exposure associated with increased aggression as a child and at present	5
Brady (2007)	319	Adult	Violence exposure in the home and community (V)	Exposure associated with preference for sports themed VGs	Not reported	3
Ferguson (2011b)	302	Child	Neighbourhood Problems (V)	Not reported	Not significant	1
Ferguson, San Miguel and	603	Child	Neighbourhood problems (V)	Not significant	Exposure associated with increased aggression,	3

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Hartley (2009)					bullying, and delinquency	
Ferguson (2011b)	302	Child	Family violence (V)	Not reported	Higher reported family violence associated with increased aggression and rule-breaking behaviour	1
Ferguson et al. (2008)	355	Undergraduate	Family violence (V)	Not significant	Higher reported physical abuse, domestic violence, and verbal abuse associated with increased aggression	3
Ferguson et al. (2013)	333	Child/Adolescent	Family violence (V)	Not reported	Not significant	2
Ferguson et al. (2012)	165	Child	Family violence (V)	Not reported	Experience of physical abuse between parents associated with increased child reported aggression, and dating violence	2
Ferguson, San Miguel and Hartley (2009)	603	Child	Family violence (V)	Not significant	Higher reported family violence associated with increased aggression and bullying behaviour	3

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score**
Exelmans, Custers and Van den Bulck (2015)	3372	Adolescent	Victimisation (B)	Experience of prior victimisation associated with increased levels of general VG exposure, and both violent and non-violent gameplay	Prior victimisation associated with increased aggression	4
Yang (2012)	1069	Child*	Cyber victimisation (B)	Not significant	Higher reporting of experience of cyber victimisation associated with increased hostility, aggressive behaviour and perpetration of cyberbullying	1

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.13.2. Exposure to violence was found to be related to an increased preference for VVGs, both when participants were children and as adults, suggesting that an experience of violence in the real world may have affected their preferences for virtual content. In looking at more specific forms of violence exposure, exposure to community or home violence was not reported to be significantly related to VGs (Ferguson et al., 2008; Ferguson, San Miguel, & Hartley, 2009), apart from one study which looked at preferences for violent content (Boxer et al., 2009), and one which found exposure to violence related to a preference for sports themed VGs (Brady, 2007). Experience of having been bullied however was related to VG use, with those who reported higher levels of bullying reporting more VG use (both violent and non-violent games) (Exelmans, Custers, & Van den Bulck, 2015).

2.3.3.14. **Pro-Social Behaviour**

2.3.3.14.1. Seven studies (11%) included measures relating to prosocial behaviour, which included pro-social behaviour (Whitaker & Bushman, 2012; You, Kim, & No, 2015), civic behaviour (Ferguson et al., 2013) cooperative behaviour (Jerabeck & Ferguson, 2013; Montag et al., 2011), self-focus (Espinosa & Clemente, 2013), and trust (Montag et al., 2011). Only six studies included reported outcomes relevant for this review. The quality of the studies was mixed, with two rated as a low risk of bias, and four rated as a medium risk of bias. A summary of the studies is presented in Table 15.

Table 15: Studies That Included Additional Measures Related to Prosocial Behaviour

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score
Whitaker and Bushman (2012)	150	Undergraduate	Pro-social behaviour (B)	Lower levels of pro-social behaviour in participants who played a VVG compared to those who played a neutral or relaxing game	Not reported	3
You, Kim and No (2015)	1242	School	Pro-social Behaviour (V)	Lower levels of pro-social behaviour towards friends and family associated with increased VG exposure	Lower levels of pro-social behaviour towards both friends and family and strangers associated with increased aggression	3
Ferguson et al. (2012)	165	Child	Civic behaviour (V)	Not significant	Not reported	2
Jerabeck and Ferguson (2013)	100	Undergraduate	Co-operative behaviour (V)	Not significant	Not reported	4
Montag et al. (2011)	610	Mixed*	Cooperativeness (V)	Lower cooperativeness associated with increased VG play	Lower cooperativeness associated with increased aggression	1
Espinosa and Clemente (2013)	659	School	Self-Oriented Perspective (V)	Higher levels of SOP associated with increased VG exposure	High levels of SOP associated with increased aggression	3

Researchers	n	Sample	Measure	Relationship with Video Game Exposure	Relationship with Aggression	Risk of Bias Score
Espinosa and Clemente (2013)	659	School	Self-transcendence (V)	Lower self-transcendence associated with increased VG paly	Lower self-transcendence associated with increased aggression	3

*Gaming specific sample
**Low score equals lower risk of bias
B=Bespoke measure
V=previously validated measure

2.3.3.14.2. Prosocial behaviour was measured in two studies, one which used a behavioural measure (whereby prosocial behaviour was scored based on helping behaviour shown towards a confederate, Whitaker & Bushman, 2012)), whereas the other used a self-report measure (You, Kim, & No, 2015). In both instances, VG exposure was related to lower levels of prosocial behaviour, with the experimental study finding that participants who played a VVG were less likely to help a confederate than those who played a neutral or relaxing game, and the cross-sectional study reporting lower levels of self-reported prosocial behaviour in those who played more VGs. Similarly, low levels of cooperativeness were found to be associated with increased VG exposure (Montag et al., 2011), although two other studies found no significant difference based on VG use (Ferguson et al., 2012; Jerabeck & Ferguson, 2013). However, measures related to self-focus (self-oriented perspective and self-transcendence) found that those who played more VGs focused more on themselves (Espinosa & Clemente, 2013). Taken together, the results suggest that those who play VGs may be more focused on themselves, however, this may not mean that they are uncooperative or less prosocial than others.

2.4 DISCUSSION

2.4.1 Summary of Findings

2.4.1.1 The effect of VGs has been examined for decades, and unfortunately continues to generate confusion and criticism, in part due to the narrow focus of research. Fortunately, this is something which has been addressed more recently in the literature, with more studies including additional variables than simply violence/aggression. While there have been numerous reviews (both narrative and meta-analytical) in the area, it was felt that these failed to account for the more recent research. As such, the aim of this review was to explore the relationship between VGs and externalising behaviour, focusing on the more modern research.

2.4.1.2 A starting time point of 2005 onwards was chosen, as this was when the first of the previous generation of VG consoles (Xbox 360, PS3, Nintendo Wii) was released. The reported experimental research was required to have used one of these consoles, and non-experimental research to have been conducted and published past this date to be included. Sixty-two studies were reviewed, 17 experimental, 8 longitudinal and 37 non-experimental studies. Of note, 101 experimental studies were rejected as they either used old consoles / VGs or used computers rather than consoles (which introduces additional problems in relation to the quality of the computers being used to run the VGs). This has been a criticism of

previous VG research, with researchers highlighting that past studies (and new ones using outdated methods) are still being referred to as providing supporting evidence, despite the advancement in technology and the popularity of VGs increasing.

2.4.1.3 Overall, more studies than not indicated that there was some form of relationship between playing VGs and increases in aggression, with 25 finding a clear link and a further 30 finding some link, albeit only under some circumstances. This highlights that the association between VG play and aggression is not simplistic, and therefore it is important to consider the role of additional factors in helping to understand this relationship.

2.4.1.4 Regarding other measures included, 11 areas of interest were identified across the studies, which included areas related to VGs, other pastimes, family, peers, education and intelligence, mental health, personality, interpersonal style, physiology, addiction, substance misuse, exposure to violence, and prosocial behaviour. Significant variation in measures was noted throughout the review process, with a mixture of both validated measures (part or subscales only) and new measures, which makes generalisability and synthesis difficult. It was noted in the non-experimental literature that while some different variables were measured, many of them were only reported regarding their relationship with aggression, rather than video gaming itself. While this may be beneficial for understanding what is involved in externalising

behaviour as an outcome, it would be advantageous to know the relationship between video gaming and these variables, rather than simply focusing on externalising behaviour.

2.4.1.5 Many studies (regardless of design) relied on opportunistic or exploratory samples, with only a minority of studies seeking gaming specific samples. Given the skills required in mastering VG playing, coupled with concerns about the lasting effects of long-term exposure to VVGs, it is concerning that studies have continued to rely on convenience samples. This is even though the internet allows for easy access to gamers (such as recruitment through websites or forums) and the increase in popularity of video gaming making recruiting gamers easier for experimental studies.

2.4.1.6 Linked with the participants used is the number required to comment on potential effect sizes. Very few studies reported the results of power calculations used to generate sample size. Previous meta-analyses have estimated that there is a small effect size for VGs leading to increases in aggression. This means that a large sample is required to be confident that an effect (or lack of) is not reported in error. However, a lack of evidence for how sample size was determined makes it difficult to have confidence in some of the findings reported, particularly those which are direct in their conclusions.

2.4.2. Limitations and Future Directions

2.4.2.1. While the aim of this review was to provide a general overview of the more recent research, and what other factors are involved, the broad search terms meant that many studies were included which makes it difficult to explore specific effects or review studies in detail. This is something that would be beneficial to explore in future reviews, focusing on the specific study types or the use of validated measures to draw firmer conclusions.

4.1.1. Related to this, the variance in studies reviewed made conducting a meta-analysis difficult, as only very few studies used the same or similar measures, and a wide variety of variables were explored. While it was possible to categorise some of these (e.g. mental health, personality), the number of different variables and measures used meant it would not have been appropriate to conduct a meta-analysis. If future reviews were more focused or only validated measures were used, this would make this task easier. This approach was utilised in the Anderson et al. (2010) review, which focused on empathy as an additional outcome. Future reviews could build on this by including additional important factors when understanding violence risk.

CHAPTER THREE: CRITIQUE OF METHODS

Critique of Methods Used in Non-Experimental Violent Video Game Research

Abstract:

The aim of this critique was to explore the methods used in non-experimental research into the effects of violent video games (VVGs) on aggression. Non-experimental methods were reviewed based on the populations and methods used for measuring variables of interest, to highlight strengths and weakness in the literature. The critique highlighted areas of positive research, focusing on targeted populations and the use of validated measures, but also highlighted an over-reliance on opportunistic samples and a lack of standardisation in measures used making it difficult to draw firm conclusions about the evidence base. Comments were made about the possibilities provided by Internet research to increase access to targeted samples, as well as the importance of including comparisons between normative data with a view to supporting interpretations of findings. Finally, areas of relevance for the empirical and case study research were highlighted.

3.1. INTRODUCTION

3.1.1. As with most research, research into the effects of VVGs on players has focused on two primary methods: experimental and non-experimental. Experimental research typically compares the impact of playing different aspects of video games (VGs) (e.g. violent vs. non-violent, or competitive vs. co-operative) on players by asking them to play a VG and explore the difference in aggression scores. This may be measured through direct methods such as the Competitive Reaction Time Task (Taylor, 1967), or the Hot Sauce Paradigm[1] (Lieberman, Solomon, Greenberg, & McGregor, 1999), and/or through self-report or indirect measures such as the Aggression Questionnaire (Buss & Perry, 1992). Non-experimental research, however, focuses on general exposure to VGs over time, whether that is over the course of their lifetime or a set period such as a week or the past month. While this method relies on self-report, it presents a clearer picture of an individual's overall exposure and allows for comparison between different levels of exposure. Often, experimental research includes a self-report measure as well, which helps to provide a clearer picture of potential long-term effects rather than just a snapshot.

3.1.2. Coulson and Ferguson (2016) highlight that research into the impact of VGs have different strengths and weakness based on the

[1] These measures both rely on participants believing that they have an opportunity to aggress against another, by either blasting them with a loud noise (Competitive Reaction Time Task), or administering an extremely spicy sauce for another to consume (Hot Sauce Paradigm).

approach taken. For example, cross-sectional studies allow for comparison between pre-existing groups and tend to be relatively easy to conduct, however, they are often correlational in nature and therefore are not able to establish causality. In other words, regardless of the patterns observed, it is not possible to attribute the result to the participant's use of VGs. Longitudinal studies allow for similar exploration, but conducted over a series of time points, allowing for exploration of longer exposure. However, given their nature, it is often more complicated to conduct and ultimately is often correlational in nature. Finally, experimental research allows for a clearer examination of causality, especially if the experiment is well matched regarding the participants used, the VGs employed in the experiment, and how the research is carried out. Unfortunately, there are many variations in the way researchers conduct their experiments. This makes it difficult to interpret the results of the research, as some methods are more robust than others used (see the systematic review chapter of this thesis for an overview).

3.1.3. The focus of this critique was to explore the methods employed in non-experimental research (both cross-sectional and longitudinal) regarding the populations examined, and the different measures used in the research. As highlighted in the first chapter (systematic review), there are many various measures (e.g. family background, mental health) that measure the effects of VVGs, with non-experimental research typically having more independent measures than experimental studies. Within these different areas, there are

numerous different ways that they can be measured, such as various psychometric tests, the sources of information (self or other report), and quality of the assessment method used, making generalisability difficult. Likewise, different types of populations have been investigated, including school, adult and specific gaming samples, each of which have their benefits but also raises questions about the generalisability of the research. The aim of this critique was to evaluate the different methods used within non-experimental research into the effect of VVGs, based on the participants and the methods of assessments used.

3.2. Population

3.2.1. *Gender split*

3.2.1.1. Research into the popularity of VGs between genders suggests that the commonly held belief that gamers (individuals who play VGs) are typically male is incorrect. Data from the UK suggests that 52% of gamers are female (Internet Advertising Bureau UK, 2014), and data from America suggests that 44% of gamers are female (Entertainment Software Association, 2015). While this may reflect the popularity of VGs generally, and the rise of mobile and tablet gaming (and therefore not reflect gender differences in relation to the rate of play, frequency, and preferences), it highlights the importance of ensuring a somewhat accurate representation of gamers is included in the research. Unfortunately, this divide is not always reflected in the literature where opportunistic sampling of

female psychology undergraduates often results in a high female participant number (e.g. Anderson & Dill, 2000; Eyal, Metzger, Lingsweiler, Mahood, & Yao, 2006). While it is positive that female gamers are not excluded, research into video gaming habits highlights that there is a need for a more even gender ratio.

3.2.1.2. Some studies have ignored female gamers entirely, focusing solely on male participants in the belief that they would be more likely to be VG players. For example, Lemmens, Bushman, and Konijn (2006) and Mazurek and Engelhardt (2013) justified their exclusion of female participants due to previous research suggesting that playing VGs was a male pastime. This practice ignores half of the population of gamers, and risks misinterpreting results relating VGs to aggression when the effect may be an artefact of known gender differences in aggression (Ferguson & Garza, 2011). Other studies have ignored the issue entirely and not reported gender information. This also risks misinterpreting positive findings as relating to VGs when they may be due to sample bias. It may also risk ignoring known gender differences in self-efficacy relating to video gaming (Terlecki et al., 2011), preferences for types of VGs (Phan, Jardina, Hoyle, & Chaparro, 2012), and motivations for playing (Olson, 2010).

3.2.2. ***Age range***

3.2.2.1. VGs have increased in popularity regarding age range, with individuals who grew up with VGs continuing to play them as

adults. Developments such as the use of motion control consoles (e.g. Nintendo Wii, Xbox Connect, and PlayStation Move) have increased the appeal of VGs beyond that of traditional consoles (despite an increase in playing-related injuries, Sparks, Chase, & Coughlin, 2009), along with the increasing popularity of tablet and mobile gaming (Internet Advertising Bureau UK, 2014). However, the research into the effects of VGs tends to rely on child, adolescent and young adult samples. As with gender, when different age ranges have been included, age is not always examined separately, which again introduces possible bias given known differences in aggression in younger age groups, as well as VG specific differences such as preferences and motivations for playing (Breuer, Festl, & Quandt, 2014).

3.2.3. ***Sample selection***

3.2.3.1. In comparison to experimental research, non-experimental research offers researchers the opportunity to study different sample groups rather than a reliance on opportunity samples (usually university students), particularly as they can be completed online allowing a potentially global participant set. Examples of this have included sampling methods such as recruitment adverts on relevant websites (Grüsser, Thalemann, & Griffiths, 2007) and VG homepages (Herodotou, Kambouri, & Winters, 2011; Kim, Namkoong, Ku, & Kim, 2008), internet forums (Triberti, Villani, & Riva, 2015), social media (Rothmund, Bender, Nauroth, & Gollwitzer, 2015), and internet cafes (Wei, 2007), or only including participants that

reported playing VGs (e.g. Gunter & Daly, 2012; Mazurek & Engelhardt, 2013; Ybarra & Boyd, 2015). The use of the Internet as a research platform offers opportunities for reaching targeted populations across a range of ages, gender and locations. This helps to provide more detailed information about the populations that are important to this research area.

3.2.3.2. The nature of non-experimental research means that researchers are observing behaviour that has already occurred, as opposed to exposing participants to the potential harmful material. This has meant that the non-experimental research has been able to include vulnerable samples including child and adolescent (e.g. Carson, Pickett, & Janssen, 2011; Coker et al., 2015; You, Kim, & No, 2015), forensic (e.g. Boxer et al., 2009; DeLis et al., 2013), and mental health samples (e.g. Ferguson & Olson, 2014) which could otherwise be seen as unethical to include in a laboratory setting due to exposing vulnerable populations to potentially inappropriate content. Unfortunately, most of these studies rely on exploratory methods (such as prevalence rates), rather than seeking out specific gaming samples.

3.3. Measures

3.3.1. *Exposure to violent video games*

3.3.1.1. There is a lack of standardised approach to the measurement of VVG exposure, with some relying on self-report, others using

experimenter ratings, and some studies choosing either not to record or report it at all.

3.3.1.2. Self-report measures often rely on a method first used by Anderson and Dill (2000), whereby participants report their favourite VGs (usually three) and gave a self-assessment of violence. The score is then multiplied by the amount of gameplay reported to create a total score. Another method of self-report involved looking at the participant's weekly amount of VVG play (Sigurdsson et al., 2006), which may provide a more accurate account, given that a person's favourite VG may not be the one they play most often. Self-reporting whether a VG contains violence or experience of violent content whilst playing may allow participants to give a wider view of exposure generally, rather than relying on an overall rating for particular VGs. However, this approach is open to criticism given the importance of the perception of violence, which may vary between participants (i.e., what one person deems violent, another may not). Asking participants about their preference for certain VG genres (Hastings et al., 2009), or types of VGs (Adachi & Willoughby, 2013; Breuer, Festl, & Quandt, 2014; Funk, Baldacci, Pasold, & Baumgardner, 2004; Richmond & Wilson, 2008) may allow for a clearer understanding of which types of content are appealing to players, which again may not be reflected in what they have most recently played. Finally, measures relating to the enjoyment of violence in VGs (Yang, 2012), or whether VGs needed to be violent to be enjoyable (Espinosa & Clemente, 2013) may

offer an insight into players' motivations for engaging with violent content.

3.3.1.3. A difficulty with self-report measures is the reliance on participant view of what constitutes violent content or the use of arbitrary definitions or categories of what may be violent content. Gabbiadini, Andrighetto and Volpato (2012) employed an alternative method, which focused on exploring the effects of a VVG on players. In their study, participants were asked whether they had played the game (Grand Theft Auto IV), and if they had, often they played it and when was the last time they had played it. While this may be a limited measure of violence exposure (given that it does not account for what other VGs participants may have played), it could be argued to be a more standardised self-report for all participants given that it is a simple yes/no measure.

3.3.1.4. A way to improve this is the use of experimenter/expert ratings of violent content. Building on the measure employed by Anderson and Dill (2000), rather than asking participants to rate the violent content, experimenters instead decide on the violence level of a VG by comparing it to official VG ratings. Such rating systems include the American Entertainment Software Rating Board (e.g. Brady, 2007), the European Pan European Game Information (e.g. Lemmens, Valkenburg, & Peter, 2011), or region-specific rating systems (e.g. You, Kim, & No, 2015). Other methods of expert ratings of violent content include categorising named VGs based on

their "M" or "Mature" rating (e.g. Whitaker, Melzer, Steffgen, & Bushman, 2013), or content analysis of VG play for chosen VGs (e.g. Allahaverdipour, Bazargan, Farhadinasab, & Moeini, 2010), both of which reduce the need for participants to evaluate what is deemed as violent content.

3.3.1.5. A different measure relies on the ratings of genres rather than VGs. This follows a similar method but relying on descriptions of VG genres (e.g. Hartmann, Möller, & Krause, 2014), or participants rating whether they played a pre-defined list of chosen VGs by the experimenter that had been rated for their violent content (e.g. Wei, 2007). The use of experts may allow for more individual exploration of content or appropriateness for the sample. However, the risk of bias is increased as it still ultimately relies on homogeneity in a genre. Methods that rely on rating systems allow for greater reliability between studies, as well as using a predefined rating that reduces the risk of bias from researchers.

3.3.1.6. Not all non-experimental research directly measures exposure to VVGs, as their research may not focus on exploring the effects. For example, Nije Bijvank et al. (2009) and Lemmens, Bushman and Konijn (2006) concentrated on the appeal of VVGs for children, regardless of their VG playing habits. Other studies focus on the effects of general gaming rather than violent exposure specifically (Carson & Janssen, 2012; Coyne et al., 2012; Worth & Book, 2015), or exploring "pathological" or "addictive" VG playing (e.g.

Choo et al., 2010; Gentile, 2009; Müller et al., 2015). Both are examples of non-experimental research focusing on the harmful effects of quantity over the content of VG playing. While it is difficult to comment on the effects of VVGs without a direct measure, this method avoids the difficulties of how to rate what counts as violent content and allows for an exploration of the effects of VGs.

3.3.2. *Other variables*

3.3.2.1. Non-experimental methods can allow researchers to explore additional areas they feel are important, without the time pressure of testing participants individually (or in small groups) as they would in experimental research. Instead, questionnaire packs can be distributed to participants for them to fill in, either in their own time and return to experimenters, complete online if the measures are hosted on survey sites or allow for large numbers to complete the measures in one go such as in classroom settings. However, a difficulty of this is the large number of different measures that are used in this field, with different researchers favouring different types, some using subscales or partial measures, and others developing their own specific to the needs of their study. This creates a large number of variabilities in the results obtained and makes it difficult to standardise what is being measured to draw comparisons with other studies, or the creation or normative data which can be used to inform future work.

3.3.2.2. By using validated measures, researchers can draw comparisons between their research and research that have been completed previously. In the VG literature, typical examples of validated measures include the Aggression Questionnaire (Buss & Perry, 1992), the Childhood Behaviour Checklist (Achenbach, 1991), the Olweus Bully/Victim Questionnaire (Olweus, 1996), and the Interpersonal Reactivity Index (Davis, 1980). While a criticism of these measures may be the length of them, they allow researchers to be confident that what they want to observe is being accurately measured (if they are reliable and valid measures), as well as measure the variable in detail. For example, the Aggression Questionnaire is made of four subscales of different forms of aggression. When researchers explore their findings based on subscales, it allows for a richer interpretation of the information. A difficulty with some non-experimental research is that this is not always carried out; some researchers choose to sum full scales when the measure was initially designed to be interpreted individually. While this may make analysis easier and could be argued as appropriate due to the inter-correlation between items, if it is not something that was proposed by the original authors then it would be an inappropriate use of the measure which would compromise its validity. A method of addressing concerns about the length of validated measures is the use of only subscales that are deemed to be relevant to the study. This can allow researchers to maintain the validity they require by using existing measures, while also limiting the length of their questionnaire pack. However, it

relies on the careful interpretation of only what the subscale measures, rather than if the result applies to the focus of the whole measure.

3.3.2.3. Some researchers opt for using new measures that they may try to validate themselves, such as modifying existing scales to meet their needs or creating new measures to explore areas they feel have not been addressed in the literature. Examples of modifying measures can be found in the addiction literature. As VG addiction is not a recognised addiction (although it is now referenced in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V – American Psychiatric Association, 2013) as an area warranting further research) there is a lack of validated measures available. As such, new scales are developed based on pre-existing measures of addiction that may be similar in construct, such as gambling (e.g. Choo et al., 2010; Lemmens et al., 2006) or Internet use (Kim et al., 2008). This method can allow researchers to make informed decisions based on the evidence to tailor measures to their requirements. However, it does also open the potential for measures to be generated that may include unnecessary items or not measure what they are designed to, thus the inclusion of reliability statistics is necessary to evidence that the measure is appropriate to use.

3.3.2.4. An alternative way to measure variables is to create new measures entirely, such as using specific items from existing measures or

generating new items. In their large-scale phone survey, Breuer, Vogelgesang, Quandt and Festl (2015) chose to use only three items from the German translation of the Aggression Questionnaire. They justified doing so due to the number of participants taking part, and the desire to keep the measure brief so that other variables could be included. While this may have led to fewer dropouts, they recognised that because of this their measure is limited and they highlight that their observations may not account for the nuances in aggression, given that they have only captured one aspect of aggression. New measures may also be used to capture the presence of something, such as a diagnosis of a mental or physical health condition, or experience of something happening to participants. An example of this was used by Dittrick, Beran, Mishna, Hetherington, and Shariff (2013), whereby they provided participants with a definition of bullying and examples of behaviour and asked participants yes/no questions as to whether they had carried out that behaviour. The use of discrete variables in this manner allows for a simplified exploration of whether something has occurred for a participant. While the use of non-validated measures may allow for new areas to be explored, it does raise questions about the interpretation of the results and how much confidence can be placed in the findings. This was commented on by Ferguson and Kilburn (2009) who found in their meta-analysis that studies that used unstandardised or tests with poor validity had the highest effect sizes.

3.4. CONCLUSIONS

3.4.1. Summary of Findings

3.4.1.1. While non-experimental research is often criticised for being correlational in nature, it also offers benefits over experimental research into the effects of VVGs, as it allows for more opportunities for diverse samples, as well as the inclusion of other variables to move the debate forward from focusing solely on whether VVGs cause aggression. However, this critique has highlighted that while there are opportunities for positive steps forward in the literature, there are difficulties around the overuse of opportunity samples and the variance in measures used making it difficult to reach firm conclusions.

3.4.1.2. The overreliance of opportunity samples is a problem with non-experimental research. This is a criticism of some aspects of the literature, whereby the availability of such participants makes it easier to conduct more studies; however, there is often a lack of research that has been used with targeted populations making generalisability difficult. With VGs increasing in popularity, it is understandable why researchers justify their use of exploratory samples, given that they are likely to contain participants who play VGs. However, research that uses targeted populations would allow for a clearer comparison between population groups, as well as the opportunity to explore the nuances of these individuals regarding

their personality and interpersonal skills, as well as explore their motivations for playing VGs and understanding what VGs mean to them. It would also help when thinking about how the effects found in VG players specifically may apply to clinical settings, such as within prisons or forensic mental health settings.

3.4.1.3. When conducting research in any field, standardisation and repeated findings are important when generating an understanding of what is being explored. The use of multiple measures, with mixtures of standardised and unstandardised tests, means that it is hard to interpret the findings of the VG literature given the variability of results. It is important that researchers begin to establish agreed measures of variables of interest to generate normal data for that population group, which can then be compared to other populations. This will help to determine how different VG players are from non-VG players or VVG players from non-VVG players for example.

3.4.2. Impact of Findings on Empirical Research and Case Study

3.4.2.1. The results of this critique highlight the importance of ensuring that a targeted sample is used to ensure that the information gained is generalisable to VG players and informative for decision makers (including parents, professionals and researchers). In the case of the empirical research, it was important that a targeted VG playing population is used and that VG playing exposure is recorded. For

the case study, the research was conducted in a clinical setting to explore the role of VVGs in different contexts.

3.4.2.2. Regarding measures used, the empirical research relied on validated measures to reduce possible bias in using modified or partial measures. The results were also be compared to the normative data provided by the authors to draw comparisons between VG populations and the normative data used to develop the measure.

CHAPTER FOUR: PRIMARY EMPIRICAL RESEARCH PROJECT

Exploring the Characteristics of Violent Video Game Players Based on Moral Choices in the Video Game *Call of Duty: Modern Warfare 2*

Abstract:

This study examined the difference in personality traits of video game (VG) players and their choices made while playing a popular 18 rated violent video game (VVG). Nine hundred and six VG players were recruited for this study, which used an online questionnaire that measured motivations for playing, aggression, empathy and personality. Participants were asked about their choice in an optional level of the VG, which contained disturbing content. Players were also asked what influenced their decisions and their justification for their choice to skip, watch, or actively take part in the level. Differences in aggression scores were predictive of whether participant chose to skip or play the content, and motivation, empathy, and personality scores were predictive of whether participants chose to watch or fire their weapon during the campaign. The results of the study highlight the importance of understanding the differences between players' motivations for engaging in VGs generally, as well as violent content. It also emphasises the need to explore protective factors involved in preventing increased aggression despite repeated exposure to violent content.

4.1. INTRODUCTION

4.1.1. Violent video games (VVG) have been linked to increases in aggression (Anderson et al., 2010), decrease in empathy (Funk, Buchman, Jenks, & Bechtoldt, 2003), and decrease in moral choices (Gabbiadini, Andrighetto, & Volpato, 2012). With moral choices being included in VGs, this allows for an exploration of players' choices and their characteristics to see if there is any link between types of players, their choices in the game, and real-world aggression. This would help to propel the media violence debate away from arguing the existence of any effects towards exploring the condition for any such effects and thus how to safeguard people from them. The video game (VG) to be used in this study is Call of Duty: Modern Warfare 2 (MW2) (Activision, 2009) with the optional campaign "No Russian" (NR) being used to divide participants based on whether they actively took part, observed, or skipped the campaign.

4.1.2. The NR campaign is a campaign that has been voted the most controversial moment in the Call of Duty series (Mirror Online, 2013). It places the player in an undercover mission working with Russian terrorists who attack a Russian airport. The player is unable to prevent the attack and must walk through the scene with the gunman, choosing to either passively watch or actively take part by killing civilians. The consequences of the campaign are the

same no matter what the player chooses and there is no record of the players' actions allowing for a unique insight into players' free choice and behaviour in a VG.

4.1.3. The aim of the current study was to examine whether the decision to engage in optional violent content is related to VVG players being more aggressive in their day-to-day lives or not. It is an important area to investigate as there continues to be a divide in research between those who believe VVGs cause harmful effects and those who argue that they do not. While both research fields produce more insight into the field, it often does more to polarise opinion rather than contribute towards a greater understanding of the effects of violent media consumption.

4.1.4. The most commonly cited theory for explaining the effects of VG violence is the General Aggression Model. Proposed by Anderson and Bushman (Anderson & Bushman, 2002), it aimed to tie various theories of aggression into a working model. Applied to VGs, the model suggests that repeated exposure to VVGs will lead to an increasingly aggressive personality through priming aggressive cognitions, increasing arousal and creating aggressive states (Anderson & Bushman, 2002). However, this theory does not explain the effects of other variables known to be linked to aggression, and causes polarisation in views, with some claiming it proves that VVGs cause real-world violence and aggression (Huesmann, 2007), and others highlighting that many people play

violent games but are not violent (Kutner & Olson, 2008). To address this, Gentile and Bushman (2012) have proposed the application of the risk and resilience theory of aggression. They argue that aggression is a complicated process and no one factor causes or prevents it, therefore VGs should be one of many risk factors. This, they highlight, helps to explain why not all people who play VGs become aggressive, as they are likely to have few other risk factors and more protective factors.

4.1.5. **Motivations**

4.1.5.1. Research into VG motivations has predominantly focused on massively multiplayer online role-playing VGs such as World of Warcraft (Beard & Wickham, 2016; Billieux et al., 2013; Herodotou, Kambouri, & Winters, 2011; Yee, 2006; Yee, 2007). Research into motivations has helped to highlight that there is a range of reasons for playing and engaging in VG content (Yee, 2007). Motivations generally focus on areas such as identification with characters in the game, curiosity about the VG and/or how the VG is made, progressing in the game or achieving in-game goals, enjoyment, and socialising (Banyte & Gabeikiene, 2015; Billieux et al., 2013; Yee, 2007). Koo (2009) found that intention to play was predicted by players' desires for escapism, their perceived enjoyment of the VG, and their reported social affiliation to the VG. Social and achievement motivations have also been linked to experiences of addictive/pathological use. However, these were related to

comorbid negative self-views (self-esteem and self-worth), suggesting that these motivations may be more related to excessive use rather than addictive behaviour (i.e. playing for long periods rather than VG play causing problems in everyday functioning) (Beard & Wickham, 2016). Herodotou et al. (2011) found that achievement motivations were related to more frequent gaming and longer play times.

4.1.5.2. Regarding gaming experience, concepts such as being immersed within the VG world (Yee, 2007), which can be further defined by the terms presence (feeling present in the VG world (or spatial immersion)), and flow (feeling immersed within the activity of the VG) (Weibel & Wissmath, 2011) have been linked to motivations. Individuals who experience immersion are more likely to experience intrinsic motivations, and experientially motivated gamers more likely to experience presence and flow (Banyte & Gabeikiene, 2015). Billieux et al. (2013) found that a player's behaviours within a VG were related to the player's motivation for playing. They highlighted that some VGs allow freedom of choice, so players' motivations will influence how the player engages with the content. This underlines the importance of reviewing players' motivations when making inferences about both their gaming behaviour and the effect (if any) it may have on them in real life.

4.1.6. **Empathy**

4.1.6.1. Björkqvist, Österman and Kaukiainen (2000) concluded in their review that empathy has been demonstrated to mediate the effects of aggression. Similarly, Jolliffe and Farrington (2004) found in their systematic review that lower levels of empathy are found in offenders than controls. Therefore, this could be a possible useful mediator to explore in the media violence debate. Funk et al. (2003) found that in that children who had been playing VGs for a longer period had a decreased level of empathy and morality compared to those who had not. This was also linked to their aggression and attitudes towards violence. Similarly, Bartholow, Sestir and Davis (2005) found that empathy worked as a mediator between the effects of exposure to VG violence and aggressive behaviour. In their recent meta-analysis, Anderson and colleagues (2010) explored the effects of empathy and desensitisation and found a significant effect of exposure to VVGs reducing empathy across all types of study designs.

4.1.6.2. In their review of the literature, Miller and Eisenberg (1988) found empathy was negatively associated with both aggression and antisocial behaviours. However, they highlighted that their finding was heavily dependent on the method used to measure empathy. Anderson et al. (2010) also found this in their meta-analysis, whereby they found a small effect for empathy and aggression in VVGs studies, with the largest effect demonstrated in cross-

sectional and non-experimental designs. In their non-experimental study, Bartholow, Sestir and Davis (2005) found that while VVG exposure was linked to lower levels of empathy, higher levels of empathy in players mediated the risk of physical aggression. However, when they explored this using experimental measures, they found that empathy was no longer related. This suggests that the role of empathy may be more related to mediating long-term exposure. Alternatively, it may indicate the role of empathy in different forms of aggression, which was observed by Wei (2007), who found that while violent attitudes were related to lower levels of empathy, no relationship was found with actually aggressive behaviour.

4.1.6.3. Playing VVGs has also been linked to decreased prosocial behaviour towards others, with greater empathy helping to mediate the influence of the VVG exposure (Fraser, Padilla-Walker, Coyne, Nelson, & Stockdale, 2012). However, this result was only significant for females, highlighting the importance of player/participant characteristics. Gender differences in empathy were found in a study exploring the appeal of VVGs in men and women. This suggested that the lower empathy scores in men may explain the appeal of VVGs for them as they anticipate fewer feelings of guilt and greater enjoyment as a result of playing (Hartmann, Möller, & Krause, 2014). The role of empathy and prosocial VGs has also been shown to increase a participant's likelihood of engaging in prosocial behaviour (Prot et al., 2012),

with empathy acting as a mediator between the effects of prosocial VGs and prosocial behaviour (Prot et al., 2014).

4.1.7. **Personality**

4.1.7.1. In a large questionnaire study of VG players, Braun, Stopfer, Müller, Beutel, and Egloff (2016) found that playing frequency and preference linked to different personality traits. They found that individuals with higher levels of extroversion were more interested in action VGs, which they highlight tend to have more violent content and include a multiplayer component, which they argued may link to the sensation seeking and desire for more interaction with others found in those with higher levels of extraversion. Regarding adverse effects, Markey and Markey (2010) presented in their review of personality research in relation to VGs that higher levels of neuroticism and lower levels of agreeableness and conscientiousness were linked to increased aggression experienced following VG play. They argue that individuals who are easily upset and have difficulties regulating their emotions (high neuroticism) or have lower concern for others (low agreeableness) or are more prone to acting without thinking (low conscientiousness) are more at risk of experiencing increased aggression following VG play. This highlights the importance of understanding individual personality traits when considering the potential adverse effects of VG play.

4.1.7.2. Bartholow et al. (2005) found that individuals with higher levels of VVG exposure were more likely to have higher traits related to trait psychoticism and novelty seeking. These factors were also observed as being linked to increased levels of physical and verbal aggression, and anger. They found that "basic personality" (a term they used to refer to the sum scores of the personality factors that they measured) was more predictive than empathy for physical aggression but less predictive than VVG exposure or hostility. Psychoticism and neuroticism personality traits have been suggested as a mediator between VVG exposure and aggressive behaviour (Unsworth, Devilly, & Ward, 2007). Combined with other factors related to experiences of anger and anxiety, they found that an aggressive/labile temperament was important in understanding who was or was not affected by exposure to violent content. These findings were also found by Markey and Scherer (2009), who found that psychoticism was able to mediate the role of post-VG aggression, whereby individuals with higher levels of psychoticism were more likely to be aggressive than participants with lower levels of psychoticism post-VG play.

4.1.8. **Moral Disengagement**

4.1.8.1. Gabbiadini, Andrighetto and Volpato (2012) explored the levels of moral disengagement in people who have played the VG Grand Theft Auto and those who have not and found higher levels of moral disengagement in these gamers than in controls. Gabbiadini, Riva,

Andrighetto, Volpato and Bushman (2014) found similar results, but also examined alongside real-world acts of immoral behaviour, such as self-control, cheating, and aggression and found that those who played a violent game were more likely to engage in all of these behaviours. Based on this, one could assume that those who act immorally in the game, are more likely to be aggressive than their moral counterparts.

4.1.9. **The Current Study**

4.1.9.1. While many VGs offer free choices, they are often tied to an outcome, so the consequences are clear and the player is either rewarded or punished for their actions (Whitty, Young, & Goodings, 2011). In the NR campaign of the popular violent game MW2, players are faced with a decision of whether to observe or engage in a terrorist act (a summary of the campaign is presented in Appendix 14). Players are warned about potentially disturbing content before they play and told that their actions will not affect the game or their playing statistics, which allows players to make a choice knowing they will not be penalised. If they chose to play, they are then presented with another choice, whether to observe or take part in the campaign. Again, there are no consequences for the player whatever they choose – unless they try to shoot the perpetrators in which case the mission counts as failed and must be re-played. This allows for an exploration of the differences between those who chose to take part, as well as an opportunity to compare

three types of gamers: those who avoid, observed, or took part and to examine if there are any differences between them regarding empathy, personality, motivations for playing games and their aggressive cognitions.

4.1.9.2. ***Aims and research questions***

4.1.9.2.1. This study proposes to explore the difference in motivations, personality, aggression, and empathy between VVG players based on their choice within a VVG. It was anticipated that those who chose to engage in the terrorist attack will be more aggressive and have lower empathy. It was anticipated that this study will hope to explore the differences in motivations for playing and personality traits between the VG players to develop knowledge on the protective and risk factors for aggression related to engagement in VVG play. The hypotheses for this research were:

1. Will players who chose to engage in the scene differ in terms of aggression compared to those who chose not to play or observe?
2. Will players who opted to participate in the scene vary regarding empathy compared to those who chose not to play or watch?
3. Will the players differ regarding personality traits?
4. Will the players differ regarding motivations for playing VGs?

4.1.9.2.2. In their meta-analysis, Anderson et al. (2010) reported the effect size (r) of aggression, split into three categories: behaviour,

cognition, and affect. These effect sizes were converted to f^2 values using G*Power 3.1.7 (Faul, Erdfelder, Lang, & Buchner, 2007) and used to compute the population sizes, based on using five predictors (choice, motivations, empathy, aggression, and personality), and an error probability of 0.05. Based on this, the following sample sizes were produced:

- Aggressive behaviour - $f^2 = 0.037$, sample size = 536
- Aggressive cognition - $f^2 = 0.027$, sample size = 741
- Aggressive affect - $f^2 = 0.021$, sample size = 928

To obtain the most power, the largest sample size was aimed for.

4.2. METHOD

4.2.1. Participants

4.2.1.1. Participants were recruited from online adverts on internet forums (see Appendix 15 for a list of forums used), social media, and websites hosting online research (https://www.callforparticipants.com/; http://psych.hanover.edu/research/exponnet.html). Originally, 1204 participants started the questionnaire, however, only 906 provided their consent to take part and met the requirements of the study (disqualified n=298). Participants were disqualified for not providing consent (if over 16) or having parental consent (if under 16) to take part in the study (n=47, 15.8%), if they had not played MW2 (n=50, 16.8%), if they did not remember their choice in the

NR campaign (82, 27.5%), if they did not complete the questions relating to their reasons for their choice in the NR campaign (n=103, 34.6%), or if they did not complete the questions relating to their VG playing history (n=16, 5.4%). A summary of the participant demographics for both those who took part and those who were disqualified is presented in Table 16.

Table 16: Frequency and Percentages of Participant Demographics

	Disqualified		**Included**		**Chi-Squared**
	N	**%**	**N**	**%**	X^2 **(1, N=1204)**
Gender					58.68 *
Male	247	82.9	871	96.1	
Female	51	17.1	35	3.9	
Age					
Under 16	12	4	28	3.1	
Under 7	*0*	*0*	*1*	*3.5*	
7-11	*1*	*8.3*	*1*	*3.5*	
12	*0*	*0*	*0*	*0*	
13-15	*10*	*83.3*	*26*	*92.9*	
16-17	31	10.4	69	7.6	
18-20	58	19.5	141	15.6	
21-30	98	32.9	355	39.2	
31-40	59	19.8	235	25.9	
41-50	27	9.1	60	6.6	
51-60	7	2.3	12	1.3	
61-70	2	.7	2	.2	
71-80	2	.7	0	0	
80+	2	.7	4	.4	
Age when first played MW2					.55
Under 18	75	37.9	313	35.1	
Over 18	123	62.1	579	64.9	
Employment Status					
Unemployed	19	6.4	64	7.1	
In School / College	66	22.1	157	17.3	
Student	35	11.7	99	10.9	
Part-Time	33	11.1	82	9.1	
Full-Time	125	41.9	454	50.1	
Self-Employed	7	2.3	43	4.7	
Retired	13	4.4	7	.8	

*P=<.001

4.2.1.2. Chi-squared analysis was conducted on both gender and age when participants played MW2 in order to explore whether there were any differences between those who were included in the study and those who were excluded. The percentage of participants who were disqualified from the analysis differed by gender (X^2 (1, N=1204) = 59.36, p > .001), with a higher number of females recorded in the disqualified group (n=51, 17.1%) in comparison to the included group (n=35, 3.9%). No difference was found between the two groups in relation to the age when participants first played MW2 (X^2 (1, N=1204) = .55, p > .46).

4.2.1.3. Of the 906 participants who were included in the main analysis, 53 participants skipped the campaign ("skip"), 141 chose to play but watched the events rather than actively engaging ("watch"), and 712 who chose to play and actively engage in the disturbing content ("shoot").

4.2.2. Measures

4.2.2.1. All measures (apart from those developed specifically for this study) were scored in line with their original scoring structure and used for the analysis (i.e. using the results of the various categories and totals as appropriate, rather than analysis of individual items). An error was observed with the empathy measure, whereby two questions (19 and 20) had been merged, and only one result was

available. As such, the scores for the affected subscales (empathic concern and perspective taking) were dealt with using pro-rata techniques to include the measures in the analysis.

4.2.2.2. *Demographic information*

Socio-demographic information (including gender, age, employment status, and country of origin) was recorded before the start of the study. A copy of the questionnaire can be found in Appendix 16.

4.2.2.3. *"No Russian" questionnaire*

Participants were asked questions initially confirming that they have played the VG and what their choice was in No Russian (NR). Participants were then asked about factors that may have influenced their choice ("the game's storyline") and whether this influenced them. Depending on their choice, participants were asked yes/no questions about the reasons for their choice, along with a free text option in case their reason was not covered. A copy of the questionnaire can be found in Appendix 17.

4.2.2.4. *Video game playing history*

Participants were asked two questions about their VG playing experience; how long they had been playing (in years), and how often they spent playing a week (in hours). A copy of the questionnaire can be found in Appendix 18.

4.2.2.5. *Motivations*

The VG Motivations Questionnaire (Nije Bijvank, Konijn, & Bushman, 2012) is a 22-item measure assessing players' motivations across 7 different domains. These include: social interaction ("to meet new people"), competition ("because I often win"), fantasy – escape ("I like to do things I cannot do in real life"), fantasy – arousal ("it is exciting to be somewhere else), unwind ("to vent anger"), challenge ("to get to the next level"), and diversion ("because I have nothing better to do"). Each question is answered on a seven-point Likert scale. Reliability statistics for each of the scales are presented in Table 17.

Table 17: Means, Standard Deviations, and Reliability Statistics for Motivation Measure

	No Items	Mean	Standard Deviation	Alpha
Social	5	13.44	5.91	.91
Competition	4	10.63	4.21	.83
Fantasy – Escape	2	5.24	2.45	.70
Fantasy – Arousal	4	12.75	3.84	.75
Unwind	3	8.85	2.84	.66
Challenge	2	6.66	2.31	.80
Distraction	2	4.85	1.84	.18

All subscales reached the cut off for reliability (Cronbach's α ≥ .70), except the Unwind and Distraction subscales. Further examination of the reliability analysis for the Unwind scale highlights that if one of the items is removed ("to relax") the Alpha would increase to .91. As such, this item was removed and the subscale renamed to "unwind – catharsis' to better describe what was measured. No

changes for the Alpha of Diversion was possible, and as such, it was not used in the analysis.

4.2.2.6. *Empathy*

The Interpersonal Reactivity Index (Davis, 1980) is a 28-item measure of empathy. It is split into four categories: perspective taking ("I try to look at everybody's side of a disagreement before I make a decision"), fantasy ("when I watch a good movie, I can very easily put myself in the place of a leading character"), empathic concern ("I am often quite touched by things I see happen") and personal distress ("I sometimes feel helpless when I am in the misled of a very emotional situation"). Each question is answered on a 5-point Likert scale. Reliability statistics for each of the scales are presented in Table 18.

Table 18: Means, Standard Deviations, and Reliability Statistics for Empathy Measure

	No Items	Mean	Standard Deviation	Alpha
Fantasy	7	15.32	5.12	.74
Empathic Concern	6	15.88	3.96	.75
Perspective Taking	7	17.45	4.28	.74
Personal Distress	6	8.93	4.49	.80

All subscales reached the cut off for reliability (Cronbach's $\alpha \leq .70$).

4.2.2.7. *Aggression*

The Aggression Questionnaire (Buss & Perry, 1992)is a 29-item measure of trait aggression. It is split into four categories: physical aggression ("once in a while I can't control the urge to strike

another person"), verbal aggression ("my friends say that I'm somewhat argumentative"), anger ("I flare up quickly but get over it quickly"), and hostility ("I am sometimes eaten up with jealousy"). Each question is answered on a 5-point Likert scale. Reliability statistics for each of the scales are presented in Table 19.

Table 19: Means, Standard Deviations, and Reliability Statistics for Aggression Measure

	No Items	Mean	Standard Deviation	Alpha
Physical Aggression	9	23.44	7.35	.81
Verbal Aggression	5	17.96	4.24	.77
Anger	7	14.82	5.64	.83
Hostility	8	18.85	7.21	.85

All subscales reached the cut off for reliability (Cronbach's $\alpha \leq .70$)

4.2.2.8. ***Personality***

Big Five Inventory (John, Donahue, & Kentle, 1991) is a 44-item inventory that measures the Five Factors of Personality (Goldberg, 1993): extraversion, agreeableness, conscientiousness, neuroticism, openness. Each question is answered on a 5-point Likert scale. Reliability statistics for each of the scales are presented in Table 20.

Table 20: Means, Standard Deviations, and Reliability Statistics for Personality Measure

	No Items	Mean	Standard Deviation	Alpha
Extraversion	8	25.51	6.23	.82
Agreeableness	9	32.86	5.55	.76
Conscientiousness	9	31.19	5.76	.77
Neuroticism	8	21.11	6.10	.81
Openness	9	32.62	5.75	.75

All subscales reached the cut off for reliability (Cronbach's α ≤ .70).

4.2.3. Procedure

4.2.3.1. The study was carried out online using predominantly internet forums related to VGs. Ethical approval was granted for the study by the University of Nottingham ethics committee on the 11.07.14 (see Appendix 19 for the proposal, Appendix 20 for the application, and Appendix 21 for confirmation). The application was subsequently amended on the 22.12.14 to extend the data collection period and methods of recruitment due to small numbers (see Appendix 22 for amendments and Appendix 23 for confirmation).

4.2.3.2. Relevant forums were identified, and permission was sought from either the forum admin or a moderator (see Appendix 24 for a copy of the letter). Once granted, adverts were placed on the forum (see Appendix 25 for the forum advert) which directed participants to the study page.

4.2.3.3. Participants initially completed a brief demographics form before being directed to the study information page that was appropriate for their age (over or under 16) (see Appendix 26) which opened in a separate window. After reading the information, participants were prompted to either provide their consent or decline from the study (see Appendix 27) before being able to proceed. In the case of

under 16's, they were also required to provide parental consent to take part. While this relied on self-reported parental consent, it was deemed appropriate given that participants were not being asked to engage in age-inappropriate VG content as the questionnaire related to the choice they had already made. Once consent had been obtained, participants were taken through the measures.

4.2.3.4. After completing the measures, participants were shown a debrief and a "sources of information" sheet that was appropriate for their age (see Appendix 28). The "sources of information" page was also available throughout the study if required (via a link at the end of the page).

4.2.3.5. Participants were split based on their choices in the NR campaign of the VG. They were then compared to their scores of motivations for playing VGs, aggression, empathy, and personality. By making comparisons between groups of players, it allows for an examination of the differences in players' choice and aggression scores.

4.3. RESULTS

The data obtained from the online questionnaire was compiled for analysis using SPSS (see enclosed disc for the original raw data file, along with copies of the output files for each of the tests).

4.3.1. Choice Made in *No Russian*

4.3.1.1. Most participants were over the age of 18 when they first played MW2 (n=576, 63.9%). Most participants (n=712, 78.6%) chose to shoot their weapon in the NR campaign, followed by watching (n=141, 15.6%), with a minority choosing to skip the campaign entirely (n=53, 5.8%). A summary of participant choice based on age and gender is presented in Table 21.

Table 21: Frequencies and Percentages for Participant Choice

	Male				Female					
	Under 17		Over 18		Under 17		Over 18		Total	
	N	%	N	%	N	%	N	%	N	%
Skip	15	4.9	30	5.3	4	22.2	4	23.5	53	15.6
Watch	29	9.4	106	18.9	2	11.1	4	23.5	141	15.6
Shoot	265	85	426	75.8	12	66.7	9	52.9	712	78.6

4.3.1.2. Table 22 presents the influences for participant choice.

Table 22: Frequency and Percentages of Influence on Players' Choice

	Story		Content Warning		Media Coverage		Parents/ Guardians		Friends	
	N	%	N	%	N	%	N	%	N	%
Skip										
More	3	5.7	3	5.7	2	3.8	2	3.8	6	11.3
Less	10	18.9	11	20.8	9	17.0	5	9.4	7	13.2
No Influence	42	79.2	40	75.5	43	81.1	48	90.6	41	77.4
Watch										
More	105	74.5	23	16.3	17	12.1	2	1.4	14	9.9
Less	19	13.5	6	4.3	2	1.4	0	0	3	2.1
No Influence	14	9.9	107	75.9	137	97.2	133	94.3	118	83.7
Shoot										
More	555	77.9	185	26.0	142	19.9	17	2.4	118	16.6
Less	46	6.5	17	2.4	20	2.8	3	.4	127	17.8
No Influence	99	13.9	509	71.5	550	77.2	695	97.6	587	82.4

4.3.1.3. For those who chose to skip the campaign, none of the possible influences influenced participants choice to engage with the campaign. For those who chose to watch the campaign, the

majority (n=105, 74.5%) stated the game's storyline made them want to play the campaign more, this was also the same for those who choose to shoot their weapon during the campaign (n=555, 77.9%). Participants reasons for their choice is presented in table 23, 24, and 25.

Table 23: Frequency and Percentages of Players' Reasons for Skipping the Content (n=53)

	Yes		No	
	N	%	N	%
I did not want to play it due to the disturbing content	13	24.5	40	75.5
I did not have time to play it	6	11.3	47	88.6
I wanted to play it a later date	9	17.0	44	83.0
Other	28	52.8	25	47.2

Table 24: Frequency and Percentages of Players' Reasons for Watching the Campaign (n=141)

	Yes		No	
	N	%	N	%
Did not want to kill civilians	86	57.3	64	42.7
It made me feel uncomfortable	37	24.7	113	75.3
Did not have to do it	61	40.7	89	59.3
Did not want to waste ammo	16	10.6	134	89.3
Wanted to watch the action	13	8.7	137	91.3
Other	13	8.7	137	91.3

Table 25: Frequency and Percentages of Players' Reasons for Firing Their Gun in the Campaign (n=712)

	Yes		No	
	N	%	N	%
It was part of the story	447	62.8	265	37.2
To see what would happen	219	30.8	493	69.2
To kill civilians that had been badly injured	58	8.1	654	91.9
To take part in the undercover operation	281	39.5	431	60.5
To practice shooting	54	7.6	658	92.4
To kill civilians	90	12.6	622	87.4
Other	107	15.0	605	85.0

4.3.1.4. The most popular reason for participants choosing to skip the campaign was the "other" option, with reasons given included only

playing the multiplayer content, and not agreeing with the content. For watching the campaign, the most popular reason was that it was not a forced option, and players had the ability to choose not to fire their weapon. Other reasons given beyond the options included were not wanting to shoot unarmed characters and feeling that the content was morally wrong. Those who choose to shoot their weapon during the campaign indicated that the storyline was the main reason for their choice. Of the other choices given, participants noted that desire to maintain their undercover status, or only wanting to see what would happen was influential in their choosing. A full list of the other reasons provided by participants for each of the conditions can be found in Appendix 29.

4.3.2. Main Analysis

4.3.3. *Data Screening*

4.3.3.1. Prior to analysis, the data was items from each measure was scored according to the original instructions. Where data were missing, no scale score was produced, and the entry was treated as missing. Missing Values Analysis (MVA) was conducted for each of the measures so that the fullest sample could be used. In each case, the data file was split based on participant choice in the NR campaign, and missing data was dealt with using Expectation Maximisation.

4.3.3.2. Initial inspection highlighted that 89 cases (skip=6, watch=13, and shoot=69) had no useable data and were removed. The results of the initial MVA indicated there was no significant pattern in the missing entries for both the skip (n=52; $X^2(251) = 238.97$, p=.68) and watch conditions (n=141; $X^2(580) = 633.38$, p=.06), however, a significant pattern was found for the shoot condition. As such, further cases with large numbers of missing data were removed until a non-significant result was found (n=458, $X^2(1351) = 925.69$, p=.08). The final analysis was based on 652 participants (Skip=52, Watch=141, Shoot=652).

4.3.4. *Means, Standard Deviations, and ANOVA Analysis*

4.3.4.1. Table 26 presents the means and standard deviations for each of the measures based on participant choice. To examine any difference in results, one-way ANOVAs were produced for each of the measures. In each instance, a high score indicated greater presence of the measured factor. To reduce the risk of Type I error, Bonferroni correction procedures were used (Field, 2009), generating a significance value of p<.003.

Table 26: Means and Standard Deviations for the Psychometric Measures Across the Three Conditions

	Skip N=53		Watch N=141		Shoot N=458		ANOVA	
	M	**SD**	**M**	**SD**	**M**	**SD**	**F= (2, 649)**	
Motivation								
Social	12.76	5.66	13.09	6.36	13.80	5.67	1.36	
Competition	11.24	4.00	9.68	4.03	10.96	4.07	5.88	*
Fantasy - Escape	4.94	2.67	5.23	2.51	5.34	2.42	.66	
Fantasy - Arousal	11.93	4.78	12.93	3.56	12.97	3.69	1.83	
Unwind - Catharsis	5.06	2.76	4.60	2.53	4.67	2.53	.66	
Challenge	6.37	2.37	6.84	2.51	6.84	2.28	1.30	
Empathy								
Fantasy	16.39	6.46	15.33	4.36	15.33	4.56	1.30	
Empathic Concern	17.08	3.32	17.56	4.31	16.83	4.82	1.35	
Perspective Taking	16.53	4.18	18.96	3.04	17.61	3.79	10.78	**
Personal Distress	11.75	6.03	10.72	4.31	10.13	5.13	2.82	
Aggression								
Physical Aggression	23.39	7.14	21.74	5.55	22.83	7.46	1.60	
Verbal Aggression	14.69	3.55	13.77	3.55	14.17	4.25	1.08	
Anger	18.07	5.26	13.79	4.15	14.85	5.65	12.47	**
Hostility	22.63	5.98	17.50	6.03	18.90	7.16	10.83	**
Personality								
Extraversion	2.92	.66	2.87	.66	2.79	.78	1.06	
Agreeableness	3.50	.53	3.80	.47	3.63	.62	6.20	**
Conscientiousness	3.35	.58	3.64	.50	3.43	.64	7.46	**
Neuroticism	2.97	.73	2.66	.73	2.62	.73	5.51	
Openness	3.48	.62	3.66	.53	3.60	.64	1.65	

*p<.003
**p<.001

4.3.4.2. The results of the ANOVAs highlight significant differences in the motivations for playing VGs and empathy, aggression, and personality scores based on players' choice in the NR campaign.

4.3.4.3. For motivations, there was a statistically significant difference between groups for the competition subscale as determined by one-way ANOVA (F (2, 639) = 5.88, p<.003. A Tukey post hoc test revealed that competition scores were significantly higher in participants who chose to skip the campaign (M=11.24, SD=4.00) in comparison to those who watched (M=9.68, SD=4.03, p<.05), and between those who fired their weapon in the campaign (M=10.96, SD=4.07) and those who watched (p<.05).

4.3.4.4. For empathy, there was a significant difference between groups for the perspective taking subscale as determined by one-way ANOVA ($F(2,639) = 10.78$, $p<.001$). A Tukey post hoc test revealed that perspective taking scores were significantly higher in participants who chose to watch the campaign ($M=18.96$, $SD=3.04$) than those who skipped the campaign ($M=16.53$, $SD=4.18$, $p<.003$) or fired their weapon the campaign ($M=16.53$, $SD=4.18$, $p<.003$).

4.3.4.5. For aggression, there was a significant difference between groups for the anger and hostility subscales as determined by one-way ANOVAs ($F(2,638 = 12.47$, $p<.001$; and $F(2,638) = 10.83$, $p<.001$ respectively). Tukey post hoc testing revealed that anger scores were significantly higher in participants who skipped the campaign ($M=18.07$, $SD=5.26$) compared to those who chose to watch ($M=13.79$, $SD=4.15$, $p<.003$) or fire their weapon ($M=14.85$, $SD=5.65$, $p<.003$). Additionally, post hoc testing revealed that hostility scores were significantly higher in participants who skipped the campaign ($M=22.63$, $SD=5.98$) compared to those who chose to watch ($M=17.50$, $SD=6.03$, $p<.003$) or fire their weapon ($M=18.90$, $SD=7.16$, $p\leq.003$).

4.3.4.6. For personality, there was a significant difference between groups for the agreeableness and conscientiousness subscales as determined by one-way ANOVAs ($F(2,639) = 6.20$, $p <.003$; and $F(2,639) = 7.46$, $p\leq.001$ respectively). Tukey post hoc testing revealed that levels of agreeableness were significantly higher in

participants who chose to watch the campaign (M=3.80, SD=.47) than those who chose to skip (M=3.50, SD=.53, p≤.05), or fire their weapon in the campaign (M=3.63, SD=.62, p<.05). Post hoc testing also revealed that levels of conscientiousness were significantly higher in participants who chose to watch the campaign (M=3.64, SD=.50) compared to those who skipped (M=3.35, SD=.58, p<.05) or fired their weapon (M=3.43, SD=.64, p≤.003).

4.3.4.7. **The link between Playing Violent Video Games and Increased Aggression**

4.3.4.7.1. Significant results were found for differences in aggression scores based on participants choice to engage in optional violent content. To explore this finding further, the results of the aggression measures are presented in Table 27 along with the original normative data provided by Buss and Perry (Buss & Perry, 1992) based on male college students. The use of the original normative data was felt to be appropriate given that it is comparing it to a predominately male participant group from the general population rather than a special sample (e.g. prison, mental health).

Table 27: Comparison of Observed Results for Trait Aggression with Normative Data

	Skip		Watch		Shoot		Buss and Perry Sample	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Physical Aggression	23.39	7.14	21.74	5.55	22.83	7.46	24.3	7.7
Verbal Aggression	14.69	3.55	13.77	3.55	14.17	4.25	15.2	3.9
Anger	18.07	5.26	13.79	4.15	14.85	5.65	17.0	5.6
Hostility	22.63	5.98	17.50	6.03	18.90	7.16	21.3	5.5

4.3.4.7.2. In comparison to the normative data provided by Buss and Perry, the results obtained in this study are within the ranges originally observed by Buss and Perry, suggesting that the levels of trait aggression in VG players was within the norm group average.

4.3.5. ***Multiple Regression Analysis***

4.3.5.1. Finally, a stepwise multiple regression multiple regression was carried out with participant's choice as the predictor, and motivation (competition) entered in the first step, empathy (perspective taking) in the second, trait aggression (hostility and anger) in the third, and personality (agreeableness and conscientiousness) entered as predictors. To compare participants choice, new variables were dummy coded to produce variables based on whether participants chose to skip or play the content, (n=652) and whether they chose to watch or fire their weapon in the campaign (n=599). To reduce the risk of Type I error, Bonferroni correction procedures were used (Field, 2009), generating a significance value of $p<.007$. The results of the regression can be found in Tables 28 and 29

Table 28: Regression Analysis Predicting Participant Choice to Play NR (Skip=0, Play=1) (n=652)

	B	SE B	β	
Step 1				
Constant	1.05	.03		
Anger	-.01	.00	-.18	*
Step 2				
Constant	1.08	.03		
Anger	-.01	.00	-.13	*
Hostility	-.00	.00	-.09	

Step 1: R^2=.03, Adj R^2=.03
Step 2: R^2=.04, Adj R^2=.03
*p<.007 (Bonferroni adjusted)

Table 29: Regression Analysis Predicting Participant Choice to Fire Their Weapon in NR (Watch=0, Shoot=1) (n=599)

	B	SE B	β	
Step 1				
Constant	1.01	.09		
Perspective Taking	-.02	.01	-.16	*
Step 2				
Constant	.94	.10		
Perspective Taking	-.02	.01	-.15	*
Competition	.01	.00	.13	*
Step 3				
Constant	1.19	.13		
Perspective Taking	-.02	.01	-.13	*
Competition	.01	.00	.12	*
Conscientiousness	-.08	.03	-.12	*
Step 4				
Constant	1.39	.16		
Perspective Taking	-.02	.00	-.13	*
Competition	.01	.00	.13	*
Conscientiousness	-.11	.03	-.15	*

Step 1: R^2= .02, adj R^2= .02
Step 2: R^2= .04, adj R^2= .04
Step 3: R^2= .06, adj R^2= .05
Step 4: R^2= .06, adj R^2= .06
*p<.007 (Bonferroni adjusted)

4.3.5.2. A stepwise multiple regression was conducted to evaluate whether motivations for playing, empathy, aggression, or personality were necessary to predict whether participants chose to skip or play NR. At step 1 of the analysis, the anger scores entered the regression

equation was significantly related to participant choice (F (1,650) =20.59, p<.001). The multiple correlation coefficient was -.18, indicating approximately 3% of the variance of participants choice could be accounted for by participants anger score (F (1,650) =20.59, p<.001), whereby higher scores were associated with participants choosing to skip rather than play the content. At step 2 of the analysis hostility scores were also added however it was not found to be significantly related to participant choice when using the Bonferroni adjusted p value (F (1,649)=4.04, p=.05).

4.3.5.3. Secondly, a stepwise multiple regression was conducted to evaluate whether motivations for playing, empathy, aggression, or personality were necessary to predict whether participants chose to watch or fire their weapon during NR. At Step 1 of the analysis, the perspective taking scores entered into the regression equation was significantly related to participants actions in the campaign (F (1,597) =14.95, MSE=2.63, p<.001). The multiple correlation coefficient was -.16, indicating approximately 2% of the variance (F (1,597) =14.95, p=.000), with participants with higher perspective taking scores being more likely to watch NR. At Step 2 of the analysis, competition scores were also entered and found to be significantly related to participants actions (F (2, 596) =12.57, MSE = 2.18, p<.001). The multiple correlation coefficient was .13, indicating approximately 1% of additional variance (F (1,596) =9.96, p<.007) was explained by competition scores, with participants higher perspective taking scores and lower competition

scores being more likely to watch the campaign. At Step 3 of the analysis, Conscientiousness scores were added and were again found to be significantly related to participants actions ($F(3, 595) = 11.47$, $P < .001$). The multiple correlation coefficient was -.14, indicating approximately 2% of additional variance ($F(1,595) = 8.94$, $p = .003$) was explained by conscientiousness scores, with participants with higher perspective taking score, lower competition scores, and lower conscientiousness scores being more likely to watch NR.

4.4. DISCUSSION

4.4.1. Research into the effects of violent VGs on aggression has moved forward from looking at simple effects to considering the influence of other known variables related to aggression. This study adds to the literature by using a targeted VG playing population and comparing players based on their choice to engage with optional violent and controversial content within a popular VVG. The aim of this research was to compare VVG players based on their choice to see if there were differences in motivations for playing, empathy, trait aggression, and personality traits.

4.4.2. Summary of Results

4.4.2.1. *Aggression*

Higher levels of anger and hostility were observed in participants who chose to skip NR compared to those who chose to observe the level or actively take part in it. In comparison to the normative data provided by Buss and Perry in their original validation of the Aggression Questionnaire, the scores observed in this study were within the normal range, so while they were higher in the those who skip, they were not significantly higher than what was found in male college students. Both anger and hostility were found to be the only significant predictors of participant choice to skip or play the campaign, with higher scores associated with participants choice to skip the campaign compared to watching or actively taking part in it. Neither anger or hostility was found to be predictive in participant choice to watch or fire their weapon during the campaign.

4.4.2.2. *Empathy*

Perspective taking was the only significantly different measure of empathy. Participants who chose to watch had higher scores for perspective taking, compared to those who chose to skip or fire their weapon. Empathy was not a significant predictor of whether participants chose to skip or play the campaign, however, it was predictive of whether participants chose to watch or fire their

weapon, with higher scores predictive of participants choosing to watch rather than fire their weapon.

4.4.2.3. ***Personality***

Agreeableness and conscientiousness were found to be significantly different based on participants choice in the NR campaign. Higher scores of agreeableness and conscientiousness were found in participants who chose to watch rather skip or fire their weapon. None of the personality scales were found to be predictive of whether participants chose to skip or play the campaign, however, conscientiousness was predictive of whether participants watched or fired their weapon in the campaign, with lower scores associated with participants choosing to fire their weapon rather than watch the campaign

4.4.2.4. ***Motivations***

Levels of competition were the only significantly differing motivation observed amongst participants. Individuals who chose to skip the campaign were observed to have higher levels of competition motivations than those who chose to watch or fire their weapon. However, this was not significant in determining whether participants chose to skip or play the campaign, but was predictive of whether participants chose to watch or fire their weapon, with higher levels of competition associated with firing weapons.

4.4.3. Links to the Literature

4.4.3.1. The results of this study suggest that individuals who chose to engage in more violent content within an optional level of a VG were lower in aggression and more agreeable and conscientious than those who chose to skip the content entirely. This was a somewhat counterintuitive finding, and while it evidences that there are differences to be observed in players based on their choice within a game, it was not in the expected direction. It was assumed at the start of the study that players who chose to skip *NR* would have done so due to not wanting to engage with the "disturbing content." However, it appeared that the choice to skip was motivated by players not wanting to play the story mode of the VG, instead focusing on playing the competitive multiplayer mode. These players were found to have the highest scores for the aggression measures, as well as being more motivated to play for competitive reasons (based on their higher scores). This finding replicates the results of previous studies that highlight the role of competition in relation to increased aggressive behaviour, regardless of the presence of violent content within the VG (Adachi & Willoughby, 2011; Breuer, Scharkow, & Quandt, 2015). This supports the notion of competition being important in understanding aggressive behaviour, as well as understanding players' motivations for engaging with content when considering the effects of VGs.

4.4.3.2. Levels of empathy were also hypothesised to have been different based on players' choices within the game. This was found, but only for perspective taking, which was found to be higher in those who chose to watch rather than skip or fire their weapon. While it was initially thought that higher empathy would have been observed in those who skipped the campaign (originally conceptualised as a non-violent choice), the narrative information gained about participants choice to skip was more in line with the literature in relation to lower empathy rates in those who engage in more VVG play, in this instance those who skipped (to play the competitive multiplayer) and those who chose to fire their weapon during the campaign, with higher levels of empathy found in those who chose to watch.

4.4.3.3. Higher levels of aggression (in the form of anger and hostility) were found in those who chose to skip or fire their weapon during NR. It was also found to be predictive of participants choice to skip rather than play the campaign, suggesting that those who chose to skip (to play the competitive multiplayer) had higher levels of aggression, compared to those who chose to play NR, and the story mode of the game itself. In line with the results found in relation to competition, the results observed in this study highlight the role of competitiveness in understanding differences in aggression because of playing VGs.

4.4.3.4. A similar finding to that observed by Markey and Markey (2010) was found in this study, with lower levels of both agreeableness and conscientiousness found in those who chose to skip or fire their weapon in NR. This highlights the potential role that personality plays in understanding not only the impact of VGs on players but also possible personality differences in players which may be linked to their VG preferences. Further exploration of personality styles in players may help to further explain the potential ill-effects of violent content on players.

4.4.4. Limitations, and Future Directions

4.4.4.1. A limitation of this study relates to data collection error, whereby two items were combined, which lead to two of the subscales of the empathy measure being estimated based on the scores available. While this was done using pro-ratering techniques, it does question the validity in the empathy subscales involved and means that the information relating to them should be interpreted with caution.

4.4.4.2. An additional limitation was the sample size that was obtained. There was a high number of drop-outs recorded during this study, with many participants having to be removed due to missing data. While participants were informed how long the study would take to complete, it is possible that they may not have been prepared to give up their time for that long or may have become disinterested in the study. Future research may wish to focus on the use of

validated shorter scales, or the use of subscales which may increase sample size but may lead to additional difficulties related to the level of detail in the results obtained.

4.4.4.3. While this study included measurements of years and weekly time spent playing VGs, exposure to VVG was not included. The measure used for violence exposure was similar to that used by Gabbiadini, Andrightetto, and Volpato (2012), in that it focused on whether participants had played a particular (violent) VG or not. However, a more detailed measure of exposure may have provided more information about the role of VG playing and the variables explored in this study. If this study was repeated, it would be beneficial to include an additional measure relating to VG preferences to investigate any effects in more detail.

4.4.4.4. The initial conceptualisation of players' choice to skip the campaign meant that questions around understanding the motivation and justification for that decision were misguided and may not have been an accurate reflection of their choice. It was not considered that players may have skipped the content (and the entire narrative) to only play the competitive multiplayer. If this had been taken into account, it could have allowed for richer data about those who are attracted to violent VGs due to the narrative, compared to those who are focused on the competitive element. Future studies would be advised to consider the different types of gameplay available within VGs (e.g. story mode vs. competitive

mode) to account for different gaming preferences within the same VG.

CHAPTER FIVE: RESEARCH CASE STUDY

An Evaluation of the Current Monitoring and Restrictions of Violent Video Games in a High Secure Hospital

Abstract:

There is a lack of research relating to the effects of violent video games (VVGs) that uses clinically relevant samples, such as offenders or forensic mental health patients. The aim of this evaluation was to explore the current management and monitoring of VVGs within a high secure psychiatric hospital. The evaluation used a combination of interviews and staff surveys to establish the current procedure, and how it is implemented on the ward. The results of the evaluation indicated that despite a clear policy and that the process was well communicated between the clinical team, there were concerns raised by some staff about their role and responsibility in deciding whether a video game (VG) was appropriate for patients. Recommendations are provided for the communication of the process to staff, as well as the use of the rating systems of VGs to educate staff about their content.

5.1. INTRODUCTION

5.1.1. While much of the VG literature focuses on the ill-effects of playing VVG on children, there may also be reasons to consider the impact that VVG may have on adult samples that may be more susceptible to the effects of VVG on increasing aggression. Individuals who are (or have been) involved in forensic services (such as mental health or criminal justice services, or both) may be one such group.

5.1.2. Violent Video Games and Offending

5.1.2.1. The links between playing VVG and aggression in players have been explored in different contexts, including laboratory and questionnaire studies, both at specific time points and across longer periods of time. What is not clear is what impact VGs may have regarding real-world aggressive and violent behaviour. While certain groups of researchers have been vocal in stressing that the evidence of increased aggression in the laboratory is indicative of increased levels of youth violence, and may also be linked to high profile mass murders (e.g. Anderson, 2013), others have found no such link (Markey, Markey, & French, 2015). Data comparing the popularity of VGs generally and youth violence highlight that instances of violence have declined since the rise in popularity of VGs (Cunningham, Engelstätter, & Ward, 2011; Ferguson, 2015; Olson, 2004). Research into mass shooting events has found that a preference for VVGs is not a common factor amongst perpetrators,

and any influence it may have is secondary to more well-established risks factors for violence (Gamache, Platania, & Zaitchik, 2015; Olson, 2004). However, there appears to be some mixed evidence relating to increased levels of other forms of self-reported offending and delinquency amongst VVG players.

5.1.2.2. Research using tools such as the Child Behaviour Checklist (Achenbach, 1991), Negative Life Events (Paternoster & Mazerolle, 1994)or the National Youth Survey (Elliot, Huizinga, & Ageton, 1985) have been used in the VVG literature to measure self-reported delinquency in children. There is mixed evidence for self-reported delinquency, with some finding clear links (DeLisi et al., 2013; Exelmans, Custers, & Van den Bulck, 2015), others finding links for certain population groups, such as children and adolescents (Ferguson, 2011a), and others finding no link (Boxer et al., 2009; Ferguson & Olson, 2014; Ferguson et al., 2014; Hastings et al., 2009). The majority of research relies on using opportunity samples of school children or university students, making it difficult to interpret how these results may relate to, or differ from samples consisting of offenders, or even general adult populations.

5.1.2.3. Some studies have explored the effects of VVG in young offenders. DeLisi et al. (2013) conducted a survey of 227 young offenders, investigating both their offending behaviour and their interest in different forms of VGs. They found that serious violent behaviour and delinquency was linked to higher levels of VVG playing.

Unfortunately, there was a lack of a control group (or references to other studies using non-offending samples, which makes it difficult to compare the results or understand the influence of (or on) offending behaviour. Boxer et al. (2009) included a comparison group, surveying 430 high school students and 390 juvenile offenders and found that an increased preference for VVG was associated with participants who were young offenders. However, there was no comparison between their measured outcome (violent behaviour and delinquency) for the two samples, which again makes it difficult to explore the relationship. Both studies relied on child, adolescent, or a young adult sample, which makes it difficult to infer the risks playing VVGs may, or may not, have for adult offending populations.

5.1.3. Violent Video Games and Mental Health

5.1.3.1. Some VVG researchers have included measures of mental health, namely the internalising difficulties subscale of the Childhood Behaviour Checklist (Achenbach, 1991), or the Beck Depression Index (Beck, Steer, & Brown, 1996) or the Beck Anxiety Index (Beck & Steer, 1993). As with the research into aggression and delinquency, the results are mixed. Often mental health has been linked to potentially addictive or problematic levels of VG use (Müller et al., 2015). Individuals who report playing to "addictive" levels have been found to report higher levels of emotional difficulties, more so than those who play for extended periods of

time (Baer, Bogusz, & Green, 2011). This highlights the need to differentiate between problematic behaviour and higher frequencies of gameplay. Interestingly, Allahverdipour et al. (2010) found that in a sample of children, while problematic use was linked to increased mental health difficulties, they also found that children who did not play had higher levels of mental health difficulties than those who played for extended periods of time. This highlights how VGs may be a positive pastime for well-being if it is not to excessive levels where it is impacting a person's life (for a review of the literature, see Jones, Scholes, Johnson, Katsikitis, & Carras, 2014).

5.1.3.2. A body of research relating to VGs and mental health services has focused on how VGs can be used as a therapeutic tool. For example, VGs being developed with the specific aim of aiding therapy (Pater, Shattell, & Kagan, 2015), or how physical activity VGs can increase engagement and motivation in patients (Gamberini, Barresi, Majer, & Scarpetta, 2008). Research focusing on the impact of VGs on general mental health highlight the positives of the past time, such as engaging clients (Horne-Moyer, Moyer, Messer, & Messer, 2014), and improving well-being, as opposed to the potential adverse effects. Regarding applicability to a forensic mental health setting, Gooch and Living (2004) highlight that VGs are a positive on ward pastime for patients to engage in actively that is often a typical healthy leisure activity for individuals of their age. However, the limited literature base means that is it

difficult to know whether this research is also applicable to a forensic mental health sample (Gooch & Living, 2004).

5.1.4. The Current Service Evaluation

5.1.4.1. *Video games and high secure psychiatric services*

5.1.4.1.1. Three high secure psychiatric services in England focus on treating individuals who pose a grave and immediate risk of harm either to themselves or the public. Because of high-profile incidents, there has been an enquiry into the management of sexual and violent material within these services (Fallon Enquiry, 1999). Because of this enquiry, the hospitals introduced (amongst other things) measures to manage the access patients had to the Internet, as well as increased security measures designed to prevent patient access to harmful material. This has predominantly affected the management of pornography (Mercer, 2012), but has also impacted on the management of playing VGs through restrictions on internet-enabled consoles in the hospitals.

5.1.4.1.2. In a discourse analysis study focusing on sexually violent material (including VGs) in one of the hospitals, Mercer and Parkinson (2014) highlight the difficulty in managing VVG within the service. In interviews with staff and patients, they identified problems with conflicting policy information (with stricter controls around access to sexual material than violent content), coupled with issues relating to challenging the appropriateness of legal and socially

accepted content. The focus of the current research was to explore the current policies around the management of VGs specifically within a high secure service, with references made to the current policies and procedures in the service, along with a survey of information from staff working in the security department and staff who were based on the ward.

5.1.4.1.3. *Current practice*

To standardise practice and ensure that the hospital maintains its required level of security, there are numerous policies designed to inform all staff how the hospital should run. These policies cover a range of scenarios from bringing visitors to the site, to how the ward should run, and what the staff dress code is. Access to various forms of audiovisual media (including CDs, audio cassettes, DVDs, Blu-ray DVDs, game disks, videotapes, and vinyl records) in patient possession is carefully monitored and restricted as necessary. There are currently two policies which inform this, which relates to Patients Personal Possessions (P6b) and Patients Access to Sexually Explicit & Sexually Violent Material (S20). Unfortunately, both policies contain caveats that they do not cover the management of VGs and instead refer readers to each other. Relevant extracts from these policies can be found in Appendix 30.

5.1.4.1.4. *Aim and research questions for current evaluation*

The objective of the current evaluation was to explore how access to VVGs was monitored within the hospital, in the absence of a

clear policy outlining current practice. The objective of the evaluation was to identify current procedures around the monitoring of access to VVG; make recommendations on current working practice, based on the current evidence on the effects of VVG; and to publish the results to highlight the relationship between the research literature and current clinical practice. The evaluation was approved by the hospital audit group (see Appendix 31 for the audit application form, and Appendix 32 for confirmation of the audit approval).

5.2. METHOD

5.2.1. Sample

5.2.1.1. For the first part of the evaluation, the participants were members of the security department, with representation from each of the key areas: head of security, postal monitoring, and security liaison nurses. The second part of the evaluation involved members of ward-based staff across each of the wards of the hospital, apart from the intensive care unit which was excluded due to the nature of the unit.

5.2.1.2. An email was sent to all of the staff involved in the named security departments (one head of security, two postal monitoring staff, and five security liaison nurses) requesting if a member of the department would like to take part. Thus n=3 for the first part of

the evaluation (one head of security, one postal monitoring, and one security liaison nurse). Each ward was visited individually, and an opportunity sample was taken based on staff availability at the time. The only exclusion criteria were that staff needed to be permanent staff for the ward and to have worked in the hospital for over one month, to ensure they were familiar with the environment and would have (more than likely) had the opportunity to facilitate access to VGs on the ward. Except for one ward, only one member of staff was available at the given time, thus n=13 (six qualified staff (one team leader, one acting team leader, and four staff nurses) and seven non-qualified staff (one activity coordinator and six healthcare assistants)). A breakdown of the second sample of staff based on their location can be found in Table 30.

Table 30: Breakdown of Participants Used in Second Part of the Evaluation (Ward Based Staff) (n=13).

	Mental Illness Pathway			**Personality Disorder Pathway**				**Mixed**		
	A	**HDU**	**AR**	**A**	**MDU**	**HDU**	**AR**	**AR**	**Male**	**Female**
Qualified Staff	1	1			1	1	1	1	4	2
Non-Qualified Staff			2		1		1		4	3
			2	1						
Total	1	1	4	1	2	1	2	1		

Qualified Staff **=** *Team Leader (1); Acting Team Leader (1); Staff Nurse (4); Non-Qualified Staff = Health Care Assistant (6), Activity Co-Ordinator (1)*
A=Admission; MDU = Medium Dependency Unit; HDU = High Dependency Unit; AR = Assertive Rehabilitation

5.2.2. Procedure

5.2.2.1. *Establishing the project team*

The project team consisted of the primary researcher who conducted the interviews and staff surveys. The project was supervised by both the University of Nottingham academic supervisor (who provided support regarding the scope of the project and reviewing materials used) and was overseen by the placement supervisor as part of the researcher's placement within the hospital. The advice of a psychologist who was part of the hospital audit group was sought regarding the application process for the evaluation, who reviewed the application and contributed to the development of the measures.

5.2.2.2. *Developing data collection tools*

The lead researcher produced the interview schedule, with contributions from the academic supervisor and research psychologist, and was included in the initial evaluation application (See Appendix 33 for the semi-structured interview schedule). The semi-structured survey for ward staff was developed based on the information gained from the interviews, with input received from both the academic supervisor and research psychologist. (See Appendix 34 for the ward questionnaire)

5.2.2.3. ***Data collection***

5.2.2.3.1. Following approval of the evaluation, contact was made with each of the identified security department staff to inform them of the research project and provide them with a participant information sheet (see Appendix 35 for the participant information sheet). Consent was obtained through written response to the email, and verbally before the start of the interview. Participants were provided with additional participant information sheet (one had been included in the email) to review before giving their consent. Each member of staff was then interviewed separately, and responses were recorded with pen and paper and then typed up by the interviewer. Copies of the transcript were then sent to the relevant participant for confirmation of accuracy. The results of the interview material were then analysed for information relating to practice to develop a semi-structured questionnaire for administering to the nursing staff on the ward.

5.2.2.3.2. I visited each ward to either collect data or arrange a convenient time to visit if it was not possible at the time. On arrival, research staff requested to speak to the nurse in charge and explained the purpose of the evaluation briefly and asked which staff would be most appropriate to approach to take part (based on who was currently working). Where possible, participants were chosen based on where they were currently working on the ward (for example, preference was given to staff who were at the nurses' station at the time rather than staff who were engaged in an activity with

patients) to minimise disruption to the ward. The staff were informed of the project aims and objectives and provided with a copy of the participant information sheet before giving their verbal consent to take part. Staff were then read out the questions from the survey, and where necessary responses were expanded on to gain additional information about staff views. Responses were recorded on the forms by the researcher, and participants were given an opportunity to review what had been written. This method was chosen due to concerns about response rates if questionnaires were distributed and collected later, rather than if they were completed with the researcher present. The researcher completed the forms with participants presents, recording their responses verbatim.

5.3. RESULTS

5.3.1. Interviews with Security Staff (n=3)

Presented below is a summary of the interviews with staff. Transcripts of the interviews can be found in Appendices 36-38.

5.3.1.1. *The current procedure for managing video games in the hospital and how it was decided*

Staff referred to the impact of the Fallon Enquiry (Fallon, Bluglass, Edwards, & Daniels, 1999) and the High-Security Directions (Department of Health, 2013) as precursors to the current

management process for VGs in the hospital. The current process has different management plans/policies for patient's own VGs (which needed to be classified as suitable for under 18), and hospital-owned VGs (which could include 18 rated VGs). Staff described the reason for allowing 18 rated VGs on the ward meant that individual wards could decide whether the content was appropriate for their patient group based on team clinical decisions rather than blanket rules for the entire hospital. Overall this was described as working well (despite the contradiction with other media content where 18 content was not allowed in the communal areas). However, there had been some examples of patients requesting 18 rated VGs that they had an individual interest in via the ward, which required monitoring by the ward.

5.3.1.2. *Persons involved in the decision-making process*

The process for new VGs arriving in the hospital was different depending on who was ordering the VG. However, both required the involvement of the nursing team, wider clinical team, and security department in deciding if a VG was appropriate.

5.3.1.3. *How decisions are made about video games*

Regarding checks made to the VG, the postal monitoring service was responsible for checking that a VG was a genuine copy and ensuring that the rating was appropriate for who it was ordered by (patient or ward). Both the British Board of Film Classification (BBFC) and the Pan European Gaming Information (PEGI) rating

systems were used in the hospital to inform decision making, which is why VGs under an 18 classification could reflect the differences in the two systems (The BBFC system used 12, 15, and 18 ratings, whereas PEGI uses 12, 16, and 18). There were no examples of VGs that had been banned from the hospital. However, *Grand Theft Auto IV* was raised as an example of a VG that was unlikely to be approved due to the realism and content of the VG, and the impact of the media portrayal of the VG, and the appropriateness of it being played in the hospital.

5.3.1.4. ***Staff opinions of the research literature and its impact on practice***

Staff spoke about the lack of clarity around the literature, and how it relates to a hospital environment. While some staff talked about relying on clinical judgement and experience, there was some reference to being aware of the evidence base, and a desire for more research related to forensic mental health to help with decision making. Staff also referred to the difference in personal and clinical judgment, and how a lack of clear evidence from the research literature made it difficult to know which to follow.

5.3.2. **Ward Staff Survey (n=13)**

Presented below is a narrative summary of the findings. An overview of the results from the staff surveys can be found in

Appendix 39, and a list of the 18 rated VGs available on the wards interviewed is presented in Appendix 40.

5.3.2.1. ***Current/previous concerns about patient access to video games***

5.3.2.1.1. Figure 11 provides a summary of the concerns relating to patient access to VGs.

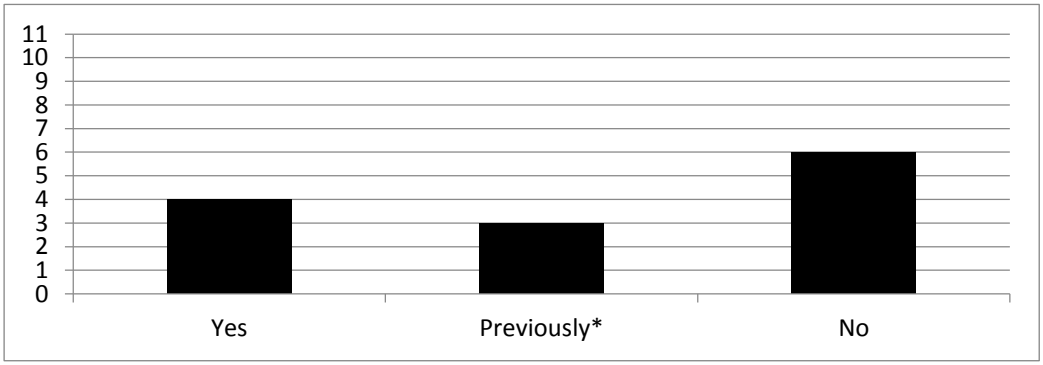


Figure 11: Staff Concerns about Access to Video Games

5.3.2.1.2. Seven out of thirteen participants stated that they had concerns about the appropriateness of patients playing VGs on the ward. Of these, four related to current patients, two related to previous concerns, and one referred to a general concern about the risk management of the physical VG disks rather than the VG content (G6). Concerns focused around the appropriateness of the VGs regarding patients engaging in the violent behaviour, being able to repeat acts linked to their index offence, or noticing that patients were becoming fixated on playing, raising the concern that it was impacting on their mental state.

5.3.2.1.3. Regarding management, staff spoke about recording concerns in the patient notes, or the use of individual care plans to help monitor usage. Other management strategies focused on the current restrictions in place to manage access to 18 rated VGs, or an ongoing technical problem with the console meaning that access was restricted. One participant raised concerns about not feeling able to challenge whether patients could play the VGs that were currently on the ward and stated their desire to have an individualised agreement about the appropriateness of VG content for individual patients.

5.3.2.2. ***How video games are managed on the ward***

5.3.2.2.1. Figure 12 provides a summary of the management strategies described by staff

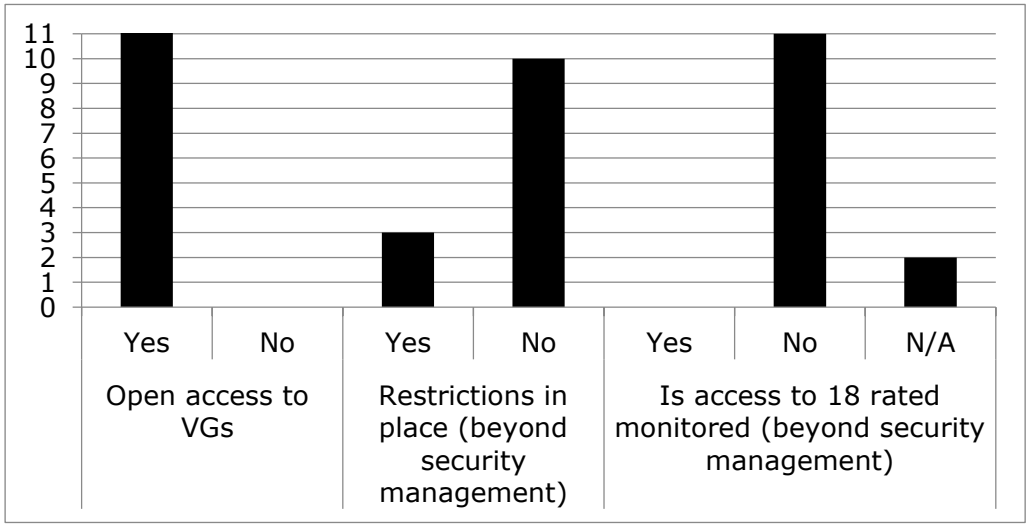


Figure 12: Current Management Strategies Relating to Video Games

5.3.2.2.2. All participants stated that the VGs on the ward were available for any patient to play, although two made references to certain VGs being restricted on an individual basis. Participants referred to how VGs are kept securely on the ward and are managed with a "one in, one out" policy for wards generally to manage the risks associated with the VG disk, rather than the content. Two participants referred to the role of the wider team in deciding whether VGs were appropriate for the ward. Some participants were unsure of the policy around 18 VGs with some stating that they thought that 18 rated VGs were not allowed and one highlighted the conflict between other policies for 18 rated content. One participant stated that some patients had access to a VGs console in their room making monitoring difficult, and one referred to the role of the position of the console to the nursing station meant that patients could be observed while playing.

5.3.2.3. ***Staff confidence in decision making around video games***

5.3.2.3.1. Figure 13 provides a summary of staff confidence in decision making and what aides they currently use.

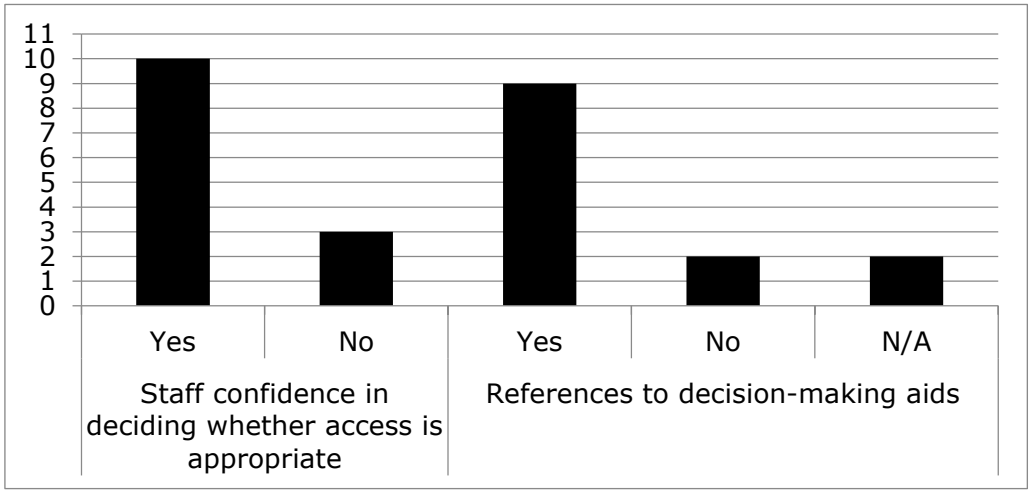


Figure 13: Staff Confidence in Decision Making and Aides Used

5.3.2.3.2. Some staff spoke about feeling confident in their own ability to decide whether a VG was appropriate for a patient or talked about the role of team decision making in supporting them. Others felt unable to overrule this decision if they had additional concerns. Reasons for feeling unable to challenge included not wanting to go against a team decision, that it would be going against the current policy, or that it would risk upsetting the patients.

5.3.2.3.3. Three participants stated that they did not have any aids for their decision making, indicating that any request was decided on an individual patient basis, that VGs would be given unless a concern had been previously raised, or that most had a history of violent offences making individual decision problematic. Current policy (mainly the ward operational policy) was cited as the primary decision-making aid, along with being familiar with patients on the ward. One member of staff highlighted that as a result of the policy they felt unable to challenge whether a patient should have access to certain VGs. Other aids for decision making included discussing it

with other team members, having a personal interest in playing VGs, and awareness of the risk associated with the disc itself rather than the content.

5.3.2.4. ***Areas for additional support or changes to the current procedure***

5.3.2.4.1. Figure 14 provides a summary of what staff felt would be helpful in the management of VGs of the ward

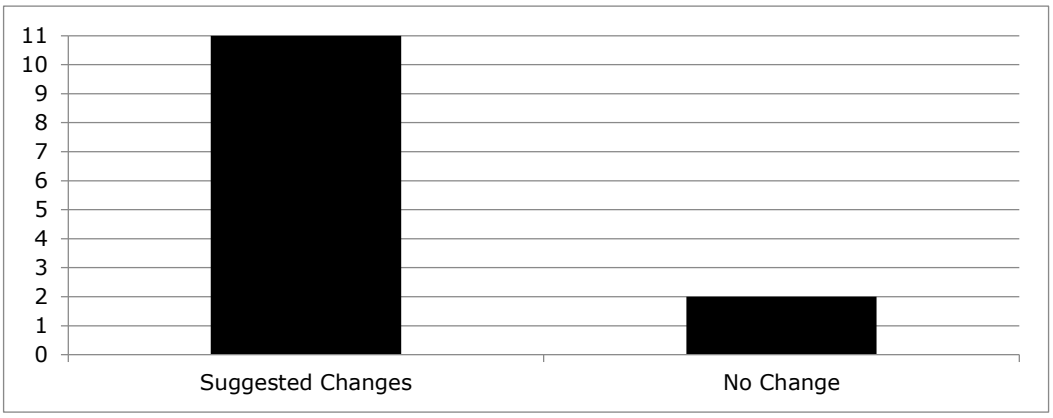


Figure 14: Staff Opinions of What Would Be Helpful in the Management of Video Games

5.3.2.4.2. Two participants stated that they were happy with the current procedure and policies, one of which said they felt this because VGs were not played on that ward.

5.3.2.4.3. Some participants reported that they were unaware of specific policies relating to the management of VGs and indicated that it would be helpful for there to be clearer guidelines about the content. One participant felt it would be useful for a centralised list of approved VGs to help wards in deciding what is appropriate to

order/allow, or that wards should be provided with information about the content of the VG to help inform their decision. The role of the wider team in decision making was also raised, with suggestions that it would be helpful for a regular space to discuss the VGs on the ward, or for more input from the wider team. Some participants stated that security staff should have more involvement, or that decisions should be made on a ward by ward basis rather than throughout the hospital.

5.3.2.4.4. Some participants also stated that they felt that age restriction should be lowered to prevent 18 and 15/16 rated VGs being played on the ward or coming into the hospital, or that VVG should not be allowed in the hospital at all no matter the age rating. Reasons for an increase in restriction included links to index offences or risk-related behaviour or concerns that it may interfere with therapy. Concerns about the appropriateness of VGs being played in the communal areas were raised by two participants, with one highlighting that while one person can be approved to play, that doesn't stop others watching. Another participant highlighted that the consoles on their ward were located away from the nursing station, making it difficult to observe who was playing or watching.

5.4. DISCUSSION

5.4.1. Much of the research into the effects of VVG has focused on either child, adolescent, or young adult samples, with very few including

clinical samples such as offenders, those diagnosed with serious mental health conditions, or forensic mental health patients. However, it is important that the research can support clinicians to make informed choices about the appropriateness of VVG for their patients. The aim of this evaluation was to explore the current procedures for managing VGs in a high secure psychiatric hospital, and how this translates to day to day management for ward staff.

5.4.2. Despite a lack of clear policy, ward staff were all aware of the monitoring process and how decisions were made about VGs entering the ward. However, some were under the impression that 18 rated VGs were not allowed on the ward at all, which disagreed with the current practice (and on all but one ward there was at least one 18 rated VG in the ward collection). The security staff acknowledged the current lack of clarity and made references to the fact that policies that cover electronic media were due to be reviewed. Staff on the ward stated that they took most of their guidance from individual ward operational policies, as well as relying on the support from the wider clinical team (including the security department) regarding understanding how best to manage the VGs.

5.4.3. Throughout the evaluation, there appeared to be an interest amongst staff to take part in the research to learn more about the management of VGs. It appeared that this was an area of interest for a lot of staff, which likely reflects the popularity of VG playing as

a past time for patients, but also an awareness of the research into the effects of VGs, and a lack of certainty around how this may relate to patients. This was especially evident when talking to staff who identified themselves as gamers, where interest and knowledge of the subject meant that they were more aware of the need to manage access appropriately. This either gave them the confidence to challenge access or indicated that they felt more concerned about the lack of clear policy to support them in doing so.

5.4.4. Some staff felt the responsibility of deciding whether a VG was appropriate or not was related to the decisions made by the security team or the wider clinical team and felt that they were unable to go against this. This was not the view expressed by the security team, who highlighted the importance of every member of staff being involved in the decision-making process, and the importance of individualised assessment. Other staff felt that wider members of the team did not participate (particularly the security department), which potentially indicates that not all staff are aware of the process for managing VGs.

5.4.5. Staff highlighted that they felt they would benefit from clearer guidelines to follow, with a clear policy about how to handle access to VGs on the ward. Suggestions were made for additional information about the content of VGs, such as a brief synopsis or indicators about content that might link to offending behaviour.

Such information is usually available on the back of VG boxes or can be found online (such as www.imdb.co.uk) if it is not clear. Likewise, the PEGI rating system uses content descriptors in addition to rating systems which staff could use to inform their decision.

5.4.6. Difficulties in observing what patients were playing, or understanding the content of the VG, were raised by some participants. One participant stated that the location of the console meant it was difficult to monitor what was being played and who else was watching. It appeared that the site of the console and TV was different on each ward, and the fixed position meant that it was not possible to relocate the consoles straightforwardly to better observe what was happening. A possible way to combat this may be to encourage staff to actively engage with patients in playing (such as co-playing or watching them play and discussing what was happening). This has been found in the literature to reduce possible adverse effects of VGs (Coyne et al., 2011; Jerabeck & Ferguson, 2013).

5.4.7. **Learning Points**

5.4.7.1. Reliance on note taking rather than recorded interviews meant some nuances and details of the conversation may have been lost. While this was mitigated through staff signing off the transcripts as accurate reflections of what was discussed, it was hard to analyse

the information further than linking themes. Related to this, the use of open response surveys allowed for greater information from ward staff than tick boxes, however, the lead researcher completed this. As a result, there is a risk of bias of what was recorded as it may not have been an accurate reflection of what was said. If this research was repeated in the future, it would be beneficial to consider the use of recording materials to ensure all information is obtained. However, given the nature of the service, this raises security concerns about the use of recording equipment.

5.4.7.2. A further limitation was the number of staff and wards that took part. It was originally planned that two members of staff from each ward would take part; however, the availability of staff at the time meant that this was only possible on one ward, with the other wards relying on responses from one member of staff, and one admission ward not taking part at all. While this meant that there was representation across the different wards of the hospital (bar the intensive care units which were deemed too acute to include), it would have been beneficial to have had additional responses to safeguard against missing information or differences in practice. This further limited the sample size, which may have meant that additional information, or difference in practice, was not considered.

5.4.7.3. Some staff highlighted concerns about the appropriateness of the current VGs in the hospital and referred to the differences in management of other forms of electronic media. Research

comparing the difference between film and VG content on aggression has suggested that VGs may have a stronger effect (Lin, 2013). Similarly, concerns about the effects of sexual material were described by some staff as being more clearly evidenced in the research literature, which is not reflected in the literature (Mercer, 2012). However, in comparison to the VG literature, there are a greater number of clinically relevant studies which can inform decision making, which may explain why staff feel that the research is clearer cut. This highlights the need for researchers looking into the effects of VVG to use clinical samples to understand whether the currently known effects are relevant (Gooch & Living, 2004; Mercer & Parkinson, 2014).

5.4.8. **Recommendations**

5.4.8.1. ***Video game policy***

As was highlighted by the security team, there was a lack of clear policy in place that focused specifically on VGs. While the current practice on the ward emphasises that the procedure is being communicated to ward staff, it would be beneficial to have the process clearly documented so that all staff are aware of their own role and responsibility, as well as that of others. Given that all wards kept their VGs in a secure cupboard, it would be beneficial for there to be a reference to the policy (either a paper copy or the details of where to find the policy) is kept in this location as an aide memoir for staff. This could also include reference to the PEGI

rating system (see section 4.8.2.) to help staff feel more confident in understanding the content of VGs allowed on the wards.

5.4.8.2. *Use of the PEGI rating system*

Staff highlighted that they would find it helpful to have clearer information that could support them in being able to make individual decisions about VGs, as well as being more informed about their content. The PEGI rating system provides content descriptors on the back of the VG box which may help staff to feel confident in deciding whether it is appropriate for patients. Information on the PEGI rating system can be found on their website (www.PEGI.info) and is also presented in Appendix 41. This information could be kept alongside the VGs stored on the ward to help staff feel confident in what is being accessed by patients

5.4.8.3. *Staff involvement in video game play*

Where there are concerns about what patients are playing, it may be beneficial for staff to join in, either watching them play and discussing what is going on, or playing the VG with them, which is a practice that occurs naturally on some wards and should be encouraged. Where possible, consoles should be accessible for staff to observe, whether that be directly (as described above), or from other parts of the communal area or nursing station. This would allow staff to be able to feel more confident about what content is being played, and perhaps help inform future decisions about whether a VG is suitable for the ward. It is recommended that, as

with other activities, patients use of VGs is closely monitored, with staff either directly observing or being involved in the VG play. Where it is not possible for the activity to be observed, it should not be allowed, and staff should be aware that the decision to allow access to VGs should be made on an individual basis and subject to risk assessment both in relation to access to a security item and content that may or not be appropriate. This will help mitigate concerns both relating to access to security items (i.e. the disc itself) as well as access to content that is not deemed appropriate.

5.4.8.4. ***Communicating concerns about what patients are playing***

Staff should be encouraged to record anything they are concerned about so that it is shared with the wider clinical team and can be discussed in patient reviews or in therapy sessions. While it is important not to overstate the role of VGs in aggressive behaviour, given the lack of research involving forensic patients, it is important that attitudes that condone violence or preoccupation with violent behaviour are appropriately documented and monitored to ensure that any potential risks can be managed. Discussions about the appropriateness of VGs should be held on a regular basis with the entire multidisciplinary team, and access to ward games should be reviewed for each patient, as well as the patient group as a whole. Where it is felt that a game's content is not appropriate, access should be restricted for the entire ward given that the games are played in a communal area. Discussions about the appropriateness of VGs and request for new ones can be held both with the wider

patient group during ward meetings such as Community Meetings and CIG meetings, as well as during patient specific meetings such as ward rounds and CPA meetings.

CHAPTER SIX: CONCLUSION

6.1. Summary of Main Findings

6.1.1. The aim of this thesis was to explore the current state of the literature, concerning the most recent research and the implication that it has with regards to understanding the links between engaging in violent content and real-world aggression. This was carried out through a systematic review of the recent literature, a critique of the non-experimental methods used, an empirical research project focusing on the role of player choice and interpersonal style, and a service evaluation of the management of video games (VGs) within a forensic mental health setting.

6.1.2. The systematic review highlighted that while much of research has found a relationship between playing VGs and increased aggression, it is rarely a simple one. Many additional variables were identified relating to VG use, other pastimes, family, peers, education and intelligence, mental health, personality, interpersonal style, physiology, addiction, substance misuse, exposure to violence, and prosocial behaviour. Some studies included results related to both video gaming and aggression, which helped to further explore this complex area. However, the lack of consistency in both the measures used and the reporting of findings in relation to both video gaming and aggression make it difficult to draw firm

conclusions about the influence of the wide range of additional variables explored.

6.1.3. The critique of the non-experimental research built on this observation, highlighting the lack of consistency in measures used, as well as also identifying the over-reliance on opportunity samples rather than targeted gaming or clinically relevant samples.

6.1.4. The results of the empirical research highlighted that differences in aggression scores of players were predictive of participants' choice to play or skip an optional violent level of a popular VG, and that motivation for playing, empathy, and personality styles were predictive of whether participants chose to actively engage in the violent content or watch it instead. However, this difference was not in the predicted direction, with those who were more aggressive, disagreeable and less conscientious opting to skip the content rather than playing. Furthermore, the research also indicated that those who chose to participate in the violent content demonstrated similar personality styles to individuals who are aggressive, and those who observed the content had similar personality styles to people who are less aggressive, despite showing no significant difference in aggression scores.

6.1.5. Finally, the results of the service evaluation highlighted the implications of the lack of clarity in the research, with clinicians

calling for more clinically relevant research to inform their decision-making and practice.

6.1.6. Links to the Literature

6.1.6.1. The results of this thesis contribute to the literature in three ways. Firstly, it has provided an up to date review of the literature considering the changes in technology and the role that may have had on any effects found. This serves as an update to a debate that has spanned over thirty years and highlights the importance of research keeping up to date with the changes in technology to ensure that any effects are being studied appropriately. The systematic review and critique highlighted the importance of using validated measures with a view to helping build firm conclusions about the effects being observed. The importance of this was demonstrated in the empirical research which found that when compared to college students, the aggression scores observed were within the expected ranges found by the original authors of the measure. Thus, while groups of players were found to be more aggressive than others, they were not more aggressive than college students. Finally, the research has presented the clinical implications of the literature base. If the research were as clear-cut as some academics say, VVGs would not be permitted within a high secure forensic mental health service. However, a lack of robust and clinically relevant research has meant that staff are reliant on their own decision making, based on their clinical judgement. This

research emphasises the need for more research with forensic populations to support the development of the needed evidence base.

6.1.6.2. *Implication of Research in Relation to Models for Explaining the Effects of Violent Media on Users*

6.1.6.2.1. The introductory chapters of this thesis introduced three models used to explain the effects of violent media on users: the general aggression model (Anderson & Bushman, 2002), the Browne Pennell model for the development of preferences for violent films (Pennell & Browne, 1999), and the catalyst model (Ferguson et al., 2008).

6.1.6.2.2. While the research presented does not demonstrate the specific effects of playing VVGs on a person's behaviour, it has helped to highlight the differences in players' characteristics and how that can be predictive of a person's choice to engage in optional violent content within a VG. The general aggression model highlights that repeated VVG playing may lead to differences in aggressive beliefs and attitudes, schema, expectations, behaviour scripts, and desensitisation, all of which may lead to an increase in aggressive personality. This was found in the empirical research, with differences in trait aggression and personality styles.

6.1.6.2.3. Similarly, the Browne and Pennell model highlights the role aggressive temperament and lower empathy being related to both

offending behaviour and a preference for violent media. This was found in the empirical research, with increased aggressive traits (anger and hostility) being predictive of participants choice to skip the NR campaign (which narrative review found to relate to the desire to play the competitive multiplayer rather than due to wanting to avoid the content). Lower levels of perspective taking were also associated with participants choosing to watch rather than actively engage in the violent content, confirming the role of lower empathy in preference for more violent content.

6.1.6.2.4. Finally, the Catalyst Model highlights the role of media violence in providing a stylistic catalyst for violence rather than necessarily predicting violence, which was supported by the findings that the aggression scores in participants were within the expected range based on the normative data presented by the original author, rather than being significantly higher, as would be suspected if playing VVGs was linked directly to increased aggression.

6.1.7. Reflections on the Research Process

6.1.7.1. Having explored the relationship between violent media and aggression since A-Level psychology, I was pleased to be able to continue exploring this as part of my academic requirements of my professional doctorate in forensic psychology. When MW2 was released, I was completing my dissertation as part of my undergraduate degree and found myself observing the media

concern and interest in the NR campaign through fresh eyes – not only as a VG enthusiast, but as a psychology student, linking the literature I was emerging myself in to what was happening in response to the game being released. When I played the game myself I found myself questioning the role of the disturbing content notice, thinking what influence it may have on players' decisions, and whether anyone would, in fact, skip the level, or whether curiosity would dissuade anyone from doing so, as well as wondering what other players chose to do, and what others felt going through the airport (I chose to watch the level). It was something I knew I wanted to explore, and I was glad to be able to do so when the opportunity arose.

6.1.7.2. Being able to discuss the management of VGs within a high secure environment was something else I was very pleased to be able to do. It allowed me to see the real-world implications of a research area I have a longstanding interest in, to discuss the practical ramifications of a confusing literature basis and media rhetoric with those who needed to know what the evidence base was to support vulnerable adults in their recovery. It has helped to highlight for me the importance of research being conducted with clinically relevant populations, to help aid such decision making.

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Appendix 1: Rejected Review Studies

Study	Reason for Exclusion
Anderson (2004)	Unclear research question Unclear study selection
Bartlett, Anderson, and Swing (2009)	Not a systematic review
Carnagey and Anderson (2004)	Not a systematic review
Dill and Dill (1998)	Not a systematic review
Griffiths (1998)	Not a systematic review
Kirsh (2003)	Not a systematic review
Markey and Markey (2010)	Not a systematic review
McGinley and Carlo (2007)	Not a systematic review
Stratsburger, Jordan, and Donnerstein (2010)	Unclear research question Unclear study selection

Appendix 2: Email to Experts

Dear _____
My name is Rhia Phillips, I am studying for a Professional Doctorate in Forensic Psychology at the University of Nottingham (UK). As part of my Thesis, I am conducting a systematic review, under the supervision of Dr Shihning Chou, entitled:
Exploring What Additional Factors are Explored to Explain the Effects of Video Game Violence in the Modern Day Media Violence Debate: A Review Following the Systematic Approach
I would like to request any research or information you have on the topic of the effects of violent video games that I can include in my review.

In order to preserve the integrity of the research and prevent the "file draw effect" I cannot go into the specifics about my inclusion/exclusion criteria, other than to request the following:

- **The study must have been conducted from 2005 onwards**
- **It must be a primary research study**
- **The primary outcome of the study was to examine the effect of playing violent video games on aggression / and or violence**

I am aware this may result in a large number of studies, however if you are willing to forward them on to me this will allow me to apply my inclusion/exclusion criteria from a neutral stand point.

If you are willing to do so, please can you send me any relevant studies by the **_____.** Due to assignment deadlines, any articles sent after this date will not be included. If after I have received your response, you would be interested in seeing my protocol, I would be happy to forward you a copy.

Thank you very much for your help,

Rhia Phillips

Under the supervision of
Dr Shihning Chou

University of Nottingham

Appendix 3: Search Syntax

All searches initially restricted to 2005 onwards. Updates restricted from month/year of previous onwards (i.e. (August) 2014 – current, (April) 2015 – current)

Applied Social Science

	29.08.14	**20.04.15**	**16.12.15**
ti((computer* OR (computer adj game) OR (electronic ADJ game) OR nintendo OR playstation OR video* OR (video ADJ game) OR xbox) AND (aberrant OR aggress* OR anger* OR antisocial OR attack* OR belligerent* OR brutal* OR corrupt* OR crime OR criminal* OR cruel OR delinquent* OR felon* OR ferocious OR fierce OR furious OR hostile* OR injury* OR (law ADJ breaking) OR misconduct OR misdeed OR misdemeanour OR offense* OR offence* OR sadistic OR sin OR transgression OR vehement OR violent* OR wrong*)) AND ab((computer* OR (computer adj game) OR (electronic ADJ game) OR nintendo OR playstation OR video* OR (video ADJ game) OR xbox) AND (aberrant OR aggress* OR anger* OR antisocial OR attack* OR belligerent* OR brutal* OR corrupt* OR crime OR criminal* OR cruel OR delinquent* OR felon* OR ferocious OR fierce OR furious OR hostile* OR injury* OR (law ADJ breaking) OR misconduct OR misdeed OR misdemeanour OR offense* OR offence* OR sadistic OR sin OR transgression OR vehement OR violent* OR wrong*))	274	5	2

BIOSS

	29.08.14	**20.04.15**	**16.12.15**
TI=(((((((computer* OR computer game) OR electronic game) OR nintendo) OR playstation) OR video*) OR video game) OR xbox) AND ((((((((((((((((((((((((((aberrant OR aggress*) OR anger*) OR antisocial) OR attack*) OR belligerent*) OR brutal*) OR corrupt*) OR crime) OR criminal*) OR cruel) OR delinquent*) OR felon*) OR ferocious) OR fierce) OR furious) OR hostile*) OR injury*) OR law breaking) OR misconduct) OR misdeeds) OR misdemeanor) OR	**123**	8	8

		29.08.14	20.04.15	16.12.15
offense*) OR offence*) OR sadistic) OR sin) OR transgression) OR vehement) OR violent*) OR wrong*))				

Medline

	Searches	29.08.14	20.04.15	16.12.15
1	(computer* adj game).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	361		
2	(console adj game).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	1		
3	(electronic adj game).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	36		
4	"Play and Playthings"/ or Video Games/ or Nintendo.mp.	9254		
5	Video Games/ or User-Computer Interface/ or playstation.mp.	30337		
6	video*.mp. or Video Games/	90332		
7	Video Games/ or xbox.mp.	2287		
8	(computer* adj game).tw.	359		
9	(console adj game).tw.	1		
10	(electronic adj game).tw.	36		
11	nintendo.tw.	212		
12	playstation.tw.	37		
13	video*.tw.	69493		
14	video agj game.tw.	0		
15	xbox.tw.	27		
16	1 or 2 or 3 or 4 or 5 or 6 or 7	123858		

	Searches	29.08.14	20.04.15	16.12.15
17	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	70012		
18	16 and 17	70012		
19	aberrant.mp.	52002		
20	Intellectual Disability/ or aberrant.mp.	99396		
21	Mental Disorders/ or Aggression/ or Violence/ or Antisocial Personality Disorder/ or aggressi*.mp. or Behavior, Animal/	365962		
22	Stress, Psychological/ or Emotions/ or Anger/ or Adaptation, Psychological/	192346		
23	Personality Disorders/ or Conduct Disorder/ or Antisocial Personality Disorder/ or Child Behavior Disorders/ or antisocial.mp.	43877		
24	attack*.mp.	102830		
25	Homicide/ or brutal*.mp.	12023		
26	Crime/ or Social Problems/ or corrupt*.mp.	21621		
27	Crime Victims/ or Crime/ or crime.mp.	22724		
28	Criminal Law/ or criminal*.mp. or Criminal Psychology/	21169		
29	Pain/ or cruel.mp.	110629		
30	Crime/ or Prisoners/ or felon*.mp.	25044		
31	ferocious.mp.	29		
32	Aggression/ or Hostility/ or Interpersonal Relations/ or hostil*.mp.	89903		
33	"Wounds and Injuries"/ or Abdominal Injuries/ or injur*.mp. or Wounds, Gunshot/ or Wounds, Nonpenetrating/	761568		
34	(law adj breaking).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	14		
35	misconduct.mp.	7881		
36	Deception/ or Judgment/ or misdeed.mp. or Forensic Psychiatry/	24710		
37	Crime/ or misdemeanour.mp.	13002		

	Searches	29.08.14	20.04.15	16.12.15
38	Mental Disorders/ or Personality Disorders/ or Sadism/ or sadistic.mp.	134973		
39	sin.mp.	5897		
40	Emotions/ or Morals/ or Motivation/ or transgression.mp. or Cognition/	167119		
41	vehement.mp.	78		
42	Substance-Related Disorders/ or Crime/ or Stress, Psychological/ or Mental Disorders/ or Prisoners/ or Aggression/ or Violence/ or violen*.mp. or "Wounds and Injuries"/	413466		
43	wrong*.mp. or Ethics/	24736		
44	19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43	1877276		
45	aberrant.tw.	51910		
46	aggressi*.tw.	127024		
47	anger*.tw.	9596		
48	antisocial.tw.	6118		
49	attack*.tw.	88197		
50	belligeren*.tw.	88		
51	brutal*.tw.	425		
52	corrupt*.tw.	2099		
53	crime.tw.	7323		
54	criminal*.tw.	13380		
55	cruel.tw.	406		
56	delinquen*.tw.	5239		
57	felon*.tw.	572		
58	ferocious.tw.	29		
59	fierce.tw.	354		
60	furious.tw.	133		
61	hostil*.tw.	8865		
62	injur*.tw.	505042		
63	(law adj breaking).tw.	14		
64	misconduct.tw.	2031		
65	misdeed.tw.	16		
66	misdemeanour.tw.	17		
67	offens*.tw.	3774		
68	sadistic.tw.	235		
69	sin.tw.	3971		
70	transgression.tw.	495		
71	vehement.tw.	78		
72	violen*.tw.	34416		
73	wrong*.tw.	14299		
74	45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or	846147		

	Searches	29.08.14	20.04.15	16.12.15
	63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73			
75	44 and 74	840603		
76	18 and 75	5043		
	Final	**2770**	482	131

PsychINFO

	Searches	29.08.14	20.04.15	16.12.15
1	(computer* adj game).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	790		
2	(console adj game).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	6		
3	(electronic adj game).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	54		
4	"Play and Playthings"/ or Video Games/ or Nintendo.mp.	3645		
5	Video Games/ or User-Computer Interface/ or playstation.mp.	3593		
6	video*.mp. or Video Games/	45205		
7	Video Games/ or xbox.mp.	3594		
8	(computer* adj game).tw.	782		
9	(console adj game).tw.	6		
10	(electronic adj game).tw.	54		
11	nintendo.tw.	151		
12	playstation.tw.	25		
13	video*.tw.	42854		
14	video agj game.tw.	0		
15	xbox.tw.	23		
16	1 or 2 or 3 or 4 or 5 or 6 or 7	45587		
17	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	43665		
18	16 and 17	43665		
19	aberrant.mp.	5018		
20	Intellectual Disability/ or aberrant.mp.	5018		
21	Mental Disorders/ or	154535		

	Searches	29.08.14	20.04.15	16.12.15
	Aggression/ or Violence/ or Antisocial Personality Disorder/ or aggressi*.mp. or Behavior, Animal/			
22	Stress, Psychological/ or Emotions/ or Anger/ or Adaptation, Psychological/	38393		
23	Personality Disorders/ or Conduct Disorder/ or Antisocial Personality Disorder/ or Child Behavior Disorders/ or antisocial.mp.	31026		
24	attack*.mp.	29101		
25	Homicide/ or brutal*.mp.	6411		
26	Crime/ or Social Problems/ or corrupt*.mp.	23966		
27	Crime Victims/ or Crime/ or crime.mp.	34429		
28	Criminal Law/ or criminal*.mp. or Criminal Psychology/	43823		
29	Pain/ or cruel.mp.	19443		
30	Crime/ or Prisoners/ or felon*.mp.	21307		
31	ferocious.mp.	73		
32	Aggression/ or Hostility/ or Interpersonal Relations/ or hostil*.mp.	18989		
33	"Wounds and Injuries"/ or Abdominal Injuries/ or injur*.mp. or Wounds, Gunshot/ or Wounds, Nonpenetrating/	65097		
34	(law adj breaking).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	65		
35	misconduct.mp.	1805		
36	Deception/ or Judgment/ or misdeed.mp. or Forensic Psychiatry/	26169		
37	Crime/ or misdemeanour.mp.	12195		
38	Mental Disorders/ or Personality Disorders/ or Sadism/ or sadistic.mp.	75726		
39	sin.mp.	1714		
40	Emotions/ or Morals/ or Motivation/ or transgression.mp. or	103244		

	Searches	29.08.14	20.04.15	16.12.15
	Cognition/			
41	vehement.mp.	103		
42	Substance-Related Disorders/ or Crime/ or Stress, Psychological/ or Mental Disorders/ or Prisoners/ or Aggression/ or Violence/ or violen*.mp. or "Wounds and Injuries"/	145848		
43	wrong*.mp. or Ethics/	22772		
44	19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43	520817		
45	aberrant.tw.	4658		
46	aggressi*.tw.	64734		
47	anger*.tw.	22773		
48	antisocial.tw.	14027		
49	attack*.tw.	28556		
50	belligeren*.tw.	231		
51	brutal*.tw.	1142		
52	corrupt*.tw.	2198		
53	crime.tw.	27174		
54	criminal*.tw.	34049		
55	cruel.tw.	812		
56	delinquen*.tw.	22623		
57	felon*.tw.	1281		
58	ferocious.tw.	73		
59	fierce.tw.	470		
60	furious.tw.	104		
61	hostil*.tw.	17719		
62	injur*.tw.	62422		
63	(law adj breaking).tw.	65		
64	misconduct.tw.	1794		
65	misdeed.tw.	43		
66	misdemeanour.tw.	13		
67	offens*.tw.	9639		
68	sadistic.tw.	1206		
69	sin.tw.	1504		
70	transgression.tw.	1322		
71	vehement.tw.	103		
72	violen*.tw.	63892		
73	wrong*.tw.	12175		
74	45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73	312981		
75	44 and 74	292441		

	Searches	29.08.14	20.04.15	16.12.15
76	18 and 75	4193		
	TOTAL	**2273**	590	308

PsychARTICLES

	Searches	29.08.14	20.04.15	16.12.15
1	(computer* adj game).mp. [mp=title, abstract, full text, caption text]	301		
2	(console adj game).mp. [mp=title, abstract, full text, caption text]	5		
3	(electronic adj game).mp. [mp=title, abstract, full text, caption text]	11		
4	"Play and Playthings"/ or Video Games/ or Nintendo.mp.	45		
5	Video Games/ or User-Computer Interface/ or playstation.mp.	24		
6	video*.mp. or Video Games/	15386		
7	Video Games/ or xbox.mp.	17		
8	(computer* adj game).tw.	301		
9	(console adj game).tw.	5		
10	(electronic adj game).tw.	11		
11	nintendo.tw.	45		
12	playstation.tw.	24		
13	video*.tw.	15386		
14	video agj game.tw.	0		
15	xbox.tw.	17		
16	1 or 2 or 3 or 4 or 5 or 6 or 7	15559		
17	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	15559		
18	16 and 17	15559		
19	aberrant.mp.	995		
20	Intellectual Disability/ or aberrant.mp.	995		
21	Mental Disorders/ or Aggression/ or Violence/ or Antisocial Personality Disorder/ or aggressi*.mp. or Behavior, Animal/	15106		
22	[Stress, Psychological/ or Emotions/ or Anger/ or Adaptation, Psychological/]	0		
23	Personality Disorders/ or Conduct Disorder/ or Antisocial Personality	4950		

	Searches	29.08.14	20.04.15	16.12.15
	Disorder/ or Child Behavior Disorders/ or antisocial.mp.			
24	attack*.mp.	9028		
25	Homicide/ or brutal*.mp.	743		
26	Crime/ or Social Problems/ or corrupt*.mp.	869		
27	Crime Victims/ or Crime/ or crime.mp.	5025		
28	Criminal Law/ or criminal*.mp. or Criminal Psychology/	6662		
29	Pain/ or cruel.mp.	805		
30	Crime/ or Prisoners/ or felon*.mp.	666		
31	ferocious.mp.	64		
32	Aggression/ or Hostility/ or Interpersonal Relations/ or hostil*.mp.	10057		
33	"Wounds and Injuries"/ or Abdominal Injuries/ or injur*.mp. or Wounds, Gunshot/ or Wounds, Nonpenetrating/	10754		
34	(law adj breaking).mp. [mp=title, abstract, full text, caption text]	32		
35	misconduct.mp.	699		
36	Deception/ or Judgment/ or misdeed.mp. or Forensic Psychiatry/	84		
37	Crime/ or misdemeanour.mp.	1		
38	Mental Disorders/ or Personality Disorders/ or Sadism/ or sadistic.mp.	500		
39	sin.mp.	782		
40	Emotions/ or Morals/ or Motivation/ or transgression.mp. or Cognition/	629		
41	vehement.mp.	113		
42	Substance-Related Disorders/ or Crime/ or Stress, Psychological/ or Mental Disorders/ or Prisoners/ or Aggression/ or Violence/ or violen*.mp. or "Wounds and Injuries"/	10893		
43	wrong*.mp. or Ethics/	12797		
44	19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or	48328		

	Searches	29.08.14	20.04.15	16.12.15
	35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43			
45	aberrant.tw.	995		
46	aggressi*.tw.	15106		
47	anger*.tw.	12332		
48	antisocial.tw.	4950		
49	attack*.tw.	9028		
50	belligeren*.tw.	281		
51	brutal*.tw.	743		
52	corrupt*.tw.	869		
53	crime.tw.	5025		
54	criminal*.tw.	6662		
55	cruel.tw.	805		
56	delinquen*.tw.	4214		
57	felon*.tw.	666		
58	ferocious.tw.	64		
59	fierce.tw.	325		
60	furious.tw.	322		
61	hostil*.tw.	10057		
62	injur*.tw.	10754		
63	(law adj breaking).tw.	32		
64	misconduct.tw.	699		
65	misdeed.tw.	84		
66	misdemeanour.tw.	1		
67	offens*.tw.	3484		
68	sadistic.tw.	500		
69	sin.tw.	782		
70	transgression.tw.	629		
71	vehement.tw.	113		
72	violen*.tw.	10893		
73	wrong*.tw.	12797		
74	45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73	52633		
75	44 and 74	48328		
76	18 and 75	7912		
	TOTAL	**3538**	659	458

SCOPUS

	29.08.14	20.04.15	16.12.15
TITLE-ABS(computer* OR "computer PRE/1 game" OR "electronic PRE/1 game" OR nintendo OR playstation OR video* OR "video PRE/1 game" OR xbox) AND TITLE-ABS(aberrant OR aggress* OR anger* OR antisocial OR attack* OR belligerent* OR brutal* OR	4,272	1011	946

	29.08.14	20.04.15	16.12.15
corrupt* OR crime OR criminal* OR cruel OR delinquent* OR felon* OR ferocious OR fierce OR furious OR hostile* OR injury* OR "law PRE/1 breaking" OR misconduct OR misdeed OR misdemeanour OR offense* OR offence* OR sadistic OR sin OR transgression OR vehement OR violent* OR wrong*)			

Web of Science

	29.08.14	20.04.15	16.12.15
TS=(((((((((computer* OR computer game) OR electronic game) OR nintendo) OR playstation) OR video*) OR video game) OR xbox) AND ((((((((((((((((((((((((((aberrant OR aggress*) OR anger*) OR antisocial) OR attack*) OR belligerent*) OR brutal*) OR corrupt*) OR crime) OR criminal*) OR cruel) OR delinquent*) OR felon*) OR ferocious) OR fierce) OR furious) OR hostile*) OR injury*) OR law breaking) OR misconduct) OR misdeeds) OR misdemeanor) OR offense*) OR offence*) OR sadistic) OR sin) OR transgression) OR vehement) OR violent*) OR wrong*)))	**647**	74	48

Proquest

	29.08.14	20.04.15	16.12.15
ti ab(computer* ADJ Game OR console adj game OR electronic adj game OR Nintendo OR playstation OR video* OR video adj game OR xbox) AND ti ab(aberrant OR aggressi* OR anger* OR antisocial OR attack* OR belligeren* OR brutal* OR corrupt* OR Cruel OR delinquen* OR felon* OR ferocious OR fierce OR furious OR hostil* OR injur* OR misdeed OR misdemeanor OR offens* OR sadistic OR sin OR transgression OR vehement OR violen*)	**117**	1	0

Appendix 4: Inclusion/Exclusion Form

First author, date, country:

Inclusion Criteria	**Criterion met?**	**Comment**
Study design: Was the study published from 2005 onwards?	Yes Unclear Discuss No	
AND: Is the study a primary research study?	Yes Unclear Discuss No	
Population: Does the study explicitly detail the previous video game playing experience of the participants? (e.g. never played, novice, experienced, stated that it was not measured)	Yes Unclear Discuss No	
AND: Does the study explicitly state the age group of the participants	Yes Unclear Discuss No	
Exposure: <u>Experimental only</u> Was the gameplay component carried out on either an Xbox 360, PlayStation 3, or Nintendo Wii	Yes Unclear Discuss No	
AND: Is the video game used clearly stated and released from 2005 onwards	Yes Unclear Discuss No	
Outcome Were the primary outcome aggression and/or violence	Yes Unclear Discuss No	
AND Was the primary outcome measured using a validated test?	Yes Unclear Discuss No	

If all question answered with yes, include study.

Appendix 5: Relevant Studies Excluded

Study	Reason for Exclusion
Adachi and Willoughby (2013)	Study took place before 2005
Adachi, Hodson, Willoughby, and Zanette (2015)	Outcome
Anderson and Carnagey (2009)	Exposure
Anderson et al. (2008)	Study took place before 2005
Arriaga, Monteiro, and Esteves (2011)	Exposure
Arriaga, Esteves, Carneiro, and Monteiro (2008)	Exposure
Arriaga, Esteves, Carneiro, and Monteiro (2006)	Exposure
Bacchus (2007)	Exposure
Ballard, Hambly, Panee, and Nivens (2006)	Exposure
Barlett and Rodeheffer (2009)	Exposure
Barlett, Branch, Rodeheffer, and Harris (2009)	Exposure
Barlett, Harris, and Baldassaro (2007)	Exposure
Barlett, Harris, and Bruey (2008)	Exposure
Barlett, Rodeheffer, Baldassaro, Hinkin, and Harris (2008)	Exposure
Bartholow et al. (2005)	Exposure
Bickham (2005)	Study took place before 2005
Bluemke, Friedrich, and Zumbach (2010)	Exposure
Bonus, Peebles, and Riddle (2015)	Outcome
Bösche (2009)	Exposure
Bösche (2010)	Exposure
Brady (2006)	Exposure
Breuer, Scharkow, and Quandt (2014)	Exposure
Brockmyer (2015)	Review study
Busching and Krahe (2013)	Exposure
Bushman and Gibson (2011)	Population
Bushman and Huesmann (2006)	Review study
Bushman and Whitaker (2010)	Population
Carnagey and Anderson (2005)	Exposure
Carnagey, Anderson, and Bartholow (2007)	Review study
Carnagey, Anderson, and Bushman (2007)	Exposure
Carnagey (2007)	Exposure
Carson and Janssen (2012)	Outcome
Charles, Baker, Hartman, Easton, and Kreuzberger (2013)	Exposure
Chenchob (2014)	Not an aggression study
Chittaro and Sioni (2012)	Exposure
Chumbley and Griffiths (2006)	Exposure
Cicchirillo (2015)	Population
Cicchirillo and Chory-Assad	Study took place before 2005
Collins, Freeman, and Chamarro-Premuzic (2012)	Exposure
Coker et al. (2015)	Study took place before 2005
Conners-Burrow, McKelvey, and Fussell (2011)	Minimum criteria: not video game related
Coyne, Linder, Nelson, and Gentile (2012)	Minimum criteria: not video game related
de la Torre-Luque and Valero-Aguayo (2013)	Exposure

Study	Reason for Exclusion
De Simone, Verbruggen, Kuo, and Mutlu (2012)	Exposure
Denzler, Hafner, and Forster (2011)	Population
Devilly, Callahan, and Armitage (2012)	Exposure
Diaz, Wong, Hodgins, Chiu, and Goghari (2015)	Outcome
Dittrick, Beran, Mishna, Hetherington, and Shariff (2013)	Population
Eastin (2006)	Exposure
Eastin (2007)	Exposure
Eastin and Griffiths (2006)	Exposure
Eastin, Appiah, and Cicchirllo (2009)	Exposure
Ellithorpe, Cruz, Velez, Ewoldsen, and Bogert (2015)	Exposure
Elson, Breuer, Van Looy, Kneer, and Quandt (2015)	Exposure
Engelhardt, Bartholow, and Saults (2011)	Population
Engelhardt, Hilgard, and Bartholow (2015)	Exposure
Engelhardt, Mazurek, Hilgard, Rouder, and Bartholow (2015)	Exposure
Engelhardt, Bartholow, Kerr, and Bushman (2011)	Exposure
Ewoldsen et al. (2012)	Exposure
Eyal, Metzger, Lingsweiler, Mahood, and Yao (2006)	Outcome
Farrar, Krcmar, and Nowak (2006)	Exposure
Ferguson (2011)	Previously publishes data
Ferguson, Barr, et al. (2015)	Population
Ferguson, Rueda, et al. (2008)	Exposure
Ferguson, Trigani, et al. (2015)	Population
Fischer, Aydin, Kastenmuller, Frey, and Fischer (2012)	Exposure
Fischer, Kastenmuller, and Greitemeyer (2010)	Population
Fitzpatrick, Barnett, and Pagani (2012)	Study took place before 2005
Gabbiadini, Riva, Andrighetto, Volpato, and Bushman (2014)	Exposure
Gentile and Gentile (2008)	Study took place before 2005
Gentile, Swing, Anderson, Rinker, and Thomas (2014)	Exposure
Gitter, Ewell, Guadagno, Stillman, and Baumeister (2013)	Exposure
Giumetti and Markey (2007)	Population
Greitemeyer, Agthe, Turner, and Gschwendtner (2012)	Exposure
Greitemeyer (2014)	Exposure
Greitemeyer and McLatchie (2011)	Exposure
Greitemeyer and Osswald (2010)	Exposure
Greitemeyer and Osswald (2009)	Exposure
Greitemeyer (2013b)	Exposure
Greitemeyer (2013a)	Population
Grizzard et al. (2015)	Population
Grigoryan, Stepanyan, Stepanyan, and Agababyan (2007)	Exposure
Guo, Jing, and Zhu (2009)	Exposure
Hartmann, Möller, and Krause (2015)	Outcome

Study	Reason for Exclusion
Hasan, Begue, and Bushman (2013)	Population
Hasan, Begue, and Bushman (2012)	Exposure
Hasan, Begue, Scharkow, and Bushman (2013)	Population
Hayes (2011)	Exposure
Hollingdale and Greitemeyer (2013)	Exposure
Hollingdale and Greitemeyer (2014)	Population
Hopf, Huber, and Weiß (2008)	Minimum criteria: study took place before 2005
Hughes and Louw (2013)	Exposure
Hull, Brunelle, Prescott, and Sargent (2014)	Minimum criteria: study took place before 2005
Ivarsson, Anderson, Akerstedt, and Lindblad (2013)	Exposure
Ivory and Kaestle (2013)	Exposure
Ivory and Kalyanaraman (2007)	Exposure
Jeong, Biocca, and Bohil (2012)	Exposure
Kasurnovic, Blake, Dixson, and Denson (2015)	Outcome
Kim and Sundar (2013)	Exposure
Kirsh, Olczak, and Mounts (2005)	Exposure
Konijn, Bijvank, and Bushman (2007)	Exposure
Krcmar and Farrar (2009)	Exposure
Krcmar, Farrar, and McGloin (2011)	Exposure
Krcmar and Lachlan (2009)	Exposure
Kronenberger et al. (2005)	Outcome
Kryszak (2013)	Exposure
Lang, Bradley, Schneider, Kim, and Mayell (2012)	Exposure
Lin (2012)	Exposure
Lin (2013)	Exposure
Linebarger (2015)	Outcome
Liu, Teng, Lan, Zhang, and Yao (2015)	Population
Lull and Bushman (2014)	Population
Mancilla-Caceres, Espelage, and Amir (2014)	Outcome
Mancilla-Caceres, Espelage, and Amir (2015)	Population
Markey and Scherer (2009)	Exposure
Markey, Markey, and French (2015)	Review study
Mathiak and Weber (2006)	Exposure
Matthews (2015)	Exposure
McGloin, Farrar, and Krcmar (2013a)	Population
McLean and Griffiths (2013b)	Outcome
McLean and Griffiths (2013a)	Outcome
Mercer and Parkinson (2014)	Population
Mitrofan, Paul, Weich, and Spencer (2014)	Minimum criteria: not a video game study
Nowak, Krcmar, and Farrar (2008)	Exposure
Olson et al. (2009)	Study took place before 2005
Paradise (2008)	Exposure
Peng, Liu, and Mou (2008)	Exposure
Persky and Blascovich (2008)	Exposure
Polman, de Castro, and van Aken (2008)	Exposure
Poteko (2014)	Review study
Powell (2008)	Exposure
Przybylski (2014)	Outcome
Przybylski, Deci, Rigby, and Ryan (2014)	Exposure
Ravaja, Turpeinen, Saari, Puttonen, and	Exposure

Study	Reason for Exclusion
Keltikangas-Jarvinen (2008)	
Ross and Weaver (2012)	Exposure
Rowland (2015)	Outcome
Roy and Ferguson (2016)	Population
Saleem, Anderson, and Gentile (2012)	Exposure
Sauer, Drummond, and Nova (2015)	Exposure
Schmierbach (2010)	Exposure
Séguin and Klimek (2015)	Outcome
Sestir and Bartholow (2010)	Exposure
Shafer (2012)	Exposure
Sheese and Graziano (2005)	Exposure
Shibuya, Sakamoto, Ihori, and Yukawa (2008)	Minimum criteria: study took place before 2005
Surette and Maze (2015)	Outcome
Tamamiya, Matsuda, and Hiraki (2014)	Exposure
Tamura and Ohbuchi (2006)	Exposure
Teng, Chong, Siew and Skoric (2011)	Exposure
Tian and Qian (2014)	Exposure
Unsworth, Devilly, and Ward (2007)	Exposure
von Salisch, Vogelgesang, Kristen, and Oppl (2011)	Minimum criteria: study took place before 2005
Wang and Yang (2009)	Population
Weber, Ritterfeld, and Mathiak (2006)	Exposure
Wei (2007)	Exposure
Williams (2009)	Exposure
Williams (2011)	Exposure
Williams (2013)	Exposure
Williams and Skoric (2005)	Exposure
Willoughby, Adachi, and Good (2012)	Minimum criteria: study took place before 2005
Worth and Book (2015)	Outcome
Yang, Gibson, Lueke, Huesmann, and Bushman (2014)	Population
Yang, Huesmann, and Bushman (2014)	Population
Zhang, Liu, Wang, and Piao (2010)	Exposure
Zumbach, Seitz, and Bluemke (2015)	Exposure

Appendix 6: Quality Assessment Form

	Y	P	N	U	Comments
Sampling and selection bias					
Was a targeted video game playing population used?					
Was the study open to all rather than being chosen by the experimenter?					
Risk of selection bias? Low Unclear High					
Measurement bias for exposure / performance bias for intervention					
Was participants background in playing video games captured (hours, years, types, etc)					
EXPERIMENTAL ONLY: were the video games matched in terms of genre, perspective					
Risk of exposure / performance bias? Low Unclear High					
Measurement bias for outcome					
Was a validated measure used for the primary outcome?					
Were any other variables measured?					
If not, were there any acknowledgements of confounding variables?					
EXPERIMENTAL (LONGITUDINAL) ONLY: were there two (or more) time points for outcome measures?					
Risk of measurement bias for outcome? Low Unclear High					
Attrition bias					
Was a representative sample used?					
Was the number of drop outs recorded?					
Risk of attrition bias? Low Unclear High					
Other issues					
Was the statistical analysis appropriate? - Were assumptions of the data tested (e.g. normality etc)					
Were appropriate conclusions made from the results?					
Score (Yes = 0, partial = 1, no = 2, unclear =1) **Risk of bias in different domains**					

Appendix 7: Data Extraction Form

Trial ID	
Date of extraction	
Author	
Title	
Source (journal/diss), year, vol, pg, country	
Reviewer	
Sample Size	
Age	
Gender	
Exp. Level	
Study type	
Study description	
Aims and hyp of study	
No. of measures	
Method of measuring A/V	
Validated?	
Means (SD)	Variable / Sample 1 / Sample 2
Correlations	
Other analysis	
Conclusions	
Limitations	

Appendix 8: Risk of Bias for Included Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	VGs matched?	**Risk of exposure/ performance bias**	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	Statistical analysis appropriate?	Appropriate conclusions?	**Risk of bias in different domains**	**Score***	**ID**
Adachi and Willoughby (2011)	P	Y	**L**	Y	P	**L**	Y	Y	N/A	**L**	Y	Y	**L**	Y	Y	Sample	1	1_1
Arriaga et al. (2015)	P	Y	**L**	Y	N	**L**	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Exposure, Attrition	3	3_1
Bartholow, Bushman, and Sestir (2006)	U	Y	**L**	Y	N/A	**L**	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_1
Breuer, Scharkow and Quandt (2015)	P	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_3
Drummond (2015)	P	Y	**L**	Y	P	**L**	Y	P	N/A	**L**	Y	U	**L**	Y	Y	Sample, Exposure, Outcome, Attrition	4	4_2
Ferguson and Rueda (2010)	P	Y	**L**	Y	P	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Exposure, Attrition	5	5_3
Happ, Melzer, and Steffgen (2014)	P	Y	**L**	Y	N	**U**	P	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Exposure*, Outcome, Attrition	6	6_1
Jerabeck and Ferguson (2013)	P	Y	**L**	Y	P	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Exposure,	4	4_6

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 8: Risk of Bias for Included Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	VGs matched?	**Risk of exposure/ performance bias**	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	Statistical analysis appropriate?	Appropriate conclusions?	**Risk of bias in different domains**	**Score***	**ID**
																Attrition		
Krcmar, Farrar, Jalette, and McGloin (2015)	P	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_11
Mahood and Hanus (2017)	P	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_15
McGloin, Farrar, and Fishlock (2015)	P	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_16
Mihan, Anisimowicz, and Nicki (2015)	U	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_17
Stermer (2014)	P	Y	**L**	Y	Y	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_20
Valadez and Ferguson (2012)	P	Y	**L**	Y	P	**L**	Y	Y	N/A	**U**	U	U	**U**	Y	Y	Sample, Exposure, Attrition	4	4_9
Velez, Greitemeyer, Whitaker, Ewoldsen, and Bushman (2014)	Y	Y	**L**	P	Y	**L**	Y	P	N/A	**L**	U	U	**U**	Y	Y	Exposure, Outcome, Attrition	4	4_10
Whitaker and Bushman (2012)	P	Y	**L**	Y	P	**L**	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_22

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 9: Risk of Bias for Included Non-Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
Allahverdipour, Bazargan, Farhadinasab and Moeini (2010)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	Y	Y	**L**	Y	Y	Sample	1	1_2
Brady (2007)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_2
Boxer, Huesmann, Bushman, O'Brien and Moceri (2009)	P	Y	**L**	P	L	Y	Y	N/A	**L**	U	P	**U**	Y	P	Sample, Exposure, Outcome, Attrition	5	5_1
Breuer, Festl and Quandt (2014)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Attrition	2	2_2
Choo et al. (2010)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_3
Clemente, Espinosa and Vidal (2008)	P	Y	**L**	Y	L	P	N	N	**H**	U	U	**U**	Y	Y	Sample, Outcome*, Attrition	R18	R18_1
Colwell and Kato (2005)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**L**	Y	Y	Sample, Attrition	3	3_4
Coyne et al. (2012)	P	Y	**L**	Y	L	Y	N	Y	**U**	U	Y	**L**	Y	Y	Sample, Outcome*, Attrition	4	4_1
Coyne, Padilla-Walker, Stockdale and Day (2011)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Attrition	1	1_4
DeCamp (2015)	P	Y	**L**	Y	L	N	Y	N/A	**U**	U	P	**U**	Y	Y	Sample,	5	5_2

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 9: Risk of Bias for Included Non-Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
															Outcome, Attrition		
DeLisi, Vaughn, Gentile, Anderson and Shook (2013)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_5
Espinosa and Clemente (2013)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_6
Exelmans, Custers and Van den Bulck (2015)	P	Y	**L**	Y	L	U	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Outcome, Attrition	4	4_3
Ferguson, Colwell, Mlačić, Milas and Mikloušić (2011)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_7
Ferguson et al. (2008)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_8
Ferguson and Olson (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_6
Ferguson, Olson, Kutner and Warner (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**L**	Y	Y	Sample, Attrition	3	3_9
Ferguson, San Miguel and Hartley (2009)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_10
Glascock (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_11
Greitemeyer (2015)	U	Y	**L**	P	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Exposure, Attrition	4	4_4

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 9: Risk of Bias for Included Non-Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
Grüsser, Thaleman and Griffiths (2007) (2007)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Attrition	2	2_8
Gunter and Daly (2012)	P	Y	**L**	Y	L	N	Y	N/A	**U**	U	Y	**L**	Y	Y	Sample, Outcome*, Attrition	4	4_5
Hastings et al. (2009)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_9
Holtz and Appel (2011)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	P	**U**	Y	Y	Sample, Attrition	3	3_12
Janssen, Boyce, and Pickett (2012)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_10
Kirsh, Mounts, and Olczak (2006)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_13
Lemmens, Bushman and Konijn (2006)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_14
Leiner et al. (2014)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Attrition	2	2_12
Montag et al. (2011)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Attrition		1_7
Moyer (2008)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_13
Müller et al. (2015)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_14
Nije Bijvank, Konijn, and Bushman (2012)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**U**	Y	Y	Attrition	1	1_3
Rajasakran et al. (2014) (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_18

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 9: Risk of Bias for Included Non-Experimental Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
Richmond and Wilson (2008)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_19
Sigurdsson, Gudjonsson, Bragason, Kristjansdottir and Sigfusdottir (2006)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_15
Swing and Anderson (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_21
Triberti, Villani, and Riva (2015)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Attrition	2	2_16
Yang (2012)	Y	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Attrition	1	1_8
Yousef, Eapen, Zoubeidi, and Mabrouk (2014)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_18
You, Kim and No (2015)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_24
Zhen, Xie, Zhang, Wang and Li (2011)	P	Y	**L**	Y	L	Y	Y	N/A	**L**	U	U	**U**	Y	Y	Sample, Attrition	3	3_25

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 10: Risk of Bias for Included Longitudinal Studies

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	L Only: 2+ time points	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
Breuer, Vogelgesang, Quandt and Festl (2015)	Y	Y	**L**	Y	L	N	N	Y	Y	**H**	U	Y	**L**	Y	Y	Outcome*, Attrition	R15	R15_1
Bucolo (2010)	P	Y	**L**	Y	L	Y	N	N	Y	**H**	U	Y	**L**	Y	Y	Outcome*	R16	R16_1
Ferguson (2011b)	P	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	Y	Y	**L**	Y	Y	Sample	1	1_5
Ferguson, Garza, Jerabeck, Ramos and Galindo (2013)	P	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_4
Ferguson, San Miguel, Garza, and Jerabeck (2012)	P	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_5
Gentile and Bushman (2012)	P	Y	**L**	Y	L	Y	N	P	Y	**U**	U	Y	**L**	Y	Y	Sample, Outcome, Attrition	5	5_4
Gentile, Li, Khoo, Prot, and Anderson (2014)	P	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_7
Krahé, Busching, and Möller (2012)	P	Y	**L**	Y	L	N	Y	N/A	Y	**U**	U	Y	**L**	Y	Y	Sample, Outcome*, Attrition	4	4_7
Lemmens, Valkenburg and Peter (2011)	Y	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	U	Y	**L**	Y	Y	Attrition	1	1_6
Möller and Krahé (2009)	P	Y	**L**	Y	L	Y	N	Y	Y	**U**	U	Y	**L**	Y	Y	Sample, Outcome*, Attrition	4	4_8

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

	Targeted VG population?	Study open to all?	**Risk of selection bias**	Background in playing VG captured?	Risk of exposure/ performance bias	Validated primary outcome?	Other variables measured?	If not, acknowledged?	L Only: 2+ time points	**Risk of measurement bias for outcome**	Representative sample used?	No. of dropouts recorded?	**Risk of attrition bias**	**Statistical analysis appropriate?**	**Appropriate conclusions?**	**Risk of bias in different domains**	**Score***	**ID**
Ybarra and Boyd (2015)	Y	Y	**L**	Y	L	N	N	Y	Y	**H**	U	Y	**L**	Y	Y	Outcome*, Attrition	R15	R15_2
Ybarra, Huesmann, Korchmaros, and Reisner (2014)	P	Y	**L**	Y	L	Y	Y	N/A	Y	**L**	U	Y	**L**	Y	Y	Sample, Attrition	2	2_17

Y=Yes, P=Partial, N=No, U=Unclear, N/A=Not Applicable, L=Low, H=High

*Score based on rating: Y=0, P, U=1, N=2. Low score indicates lower risk of bias.

Appendix 11: Data Extracted from Experimental Studies

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
1_1 Adachi and Willoughby (2011) - 2 studies reported	42	Student Range not reported M: 18.5 (SD Not reported)	17 F 25 M	Explore whether violent or non-VVG produce differences in aggressive behaviour. Participants randomly allocated to play violent or non-violent **Video game:** Conan (Nihilistic Software, 2007) (violent) Fuel (Asobo Studio, 2009) (non violent) **Console:** Xbox 360	**Aggressive behaviour** -Hot sauce paradigm (Lieberman, Solomon, Greenberg, & McGregor, 1999)	Not Significant	/	No – competition linked in to increase, not violence
					Trait aggression – Aggression Questionnaire (Buss & Perry, 1992)	Not reported	/	
	60	Student Range not reported M: 18.3 (SD Not reported)	28 F 31 M	Examine the effect of competitiveness on aggressive behaviour, as well as test whether competitive interacts with violence to influence aggression Randomly assigned to play condition (competitive violent/non violent, or non competitive violent/non violent). Heart rate	**Aggressive behaviour** -HSP (Lieberman, Solomon, Greenberg, & McGregor, 1999)	Competitive > non-competitive Not Significant between violent / non-violent	/	
					Trait aggression - AQ (Buss & Perry, 1992)	Not Significant	/	
					Heart rate	Competitive: increased during gameplay Non-competitive: no	Not reported	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
				recorded prior and during gameplay. Played game, completed measures **Video game** Mortal Kombat vs. DC Universe (Midway Games, 2008) (violent competitive) Left 4 Dead 2 (Valve Corporation, 2009) (violent non competitive) Fuel (Asobo Studio, 2009) (non violent competitive) Marble Blast Ultra (GarageGames, 2006) (non violent non competitive) **Console:** Xbox 360		change Not Significant between violent / non-violent		
2_1 Bartholow, Bushman and Sestir (2006)	34 (39)	Student Range not reported M: 19.5 (SD Not reported)	Male	Violent and non-violent players (as deemed by exposure questionnaire) completed visual oddball task in which neutral, violent and negative non-violent target images are presented in a neural imaging context while event-related brain potentials (ERP) are recorded. Complete noise blast task	**Trait aggression** - Irritability Scale **(**Caprara, et al., 1985) and AQ (Buss & Perry, 1992)	Hostility: not significant Anger: not significant Physical: not significant Verbal: not significant		Y – behaviour N - cognitive
					Aggressive Behaviour Competitive Reaction Time Task (Taylor, 1967)	Positive		

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
					Emotional response to affective images - International Affective Picture System (Lang, Bradlet, & Cuthbert, 2005)	Violent images: negative Negative non violent images: not significant Neutral images: not significant	Violent: negative Negative: not significant Neutral: not significant	
2_3 Breuer, Scharkow and Quandt (2015)	76 (91)	Student 19-36	48 F 28 M	Exploring the effects of game outcome and trash-talking in a competitive co-located multiplayer sports video game on aggressive behaviour 2 (confederated win vs. loss) x 2 (confederate acting friendly vs. "trash talking") design **Video game:** FIFA World Cup 2010 (EA Canada, 2010) **Console:** Xbox 360	**Aggressive behaviour –** CRTT (Taylor, 1967)	Lose > win Not Significant between trash-talking/friendly		N – losing
					Positive and negative affect - 4 items (anger, irritated, ashamed, and frustrated) from German version of Positive and Negative Affect Scale (PANAS) (Krohne, Egloff, Kohlmann, & Tausch, 1996)	Anger: lose > win. No diff for trash talking/friendly Irritated: Not Significant Ashamed: lose > win. No diff trash talking / friendly Frustrated: Not Significant	Anger: Positive Irritated: Not Significant Ashamed: Not Significant Frustrated: Positive	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
2_11 Krcmar et al. (2015)– 2 studies reported, only one suitable for inclusion	200	Student 18-27	89 F 111 M	Exploring the role of risk taking (risk takers, risk avoiders, coactives, and inactive – measured in study 1 with brain imaging) and aggressive outcomes in response to VVG play Participants randomly assigned to play VVG before or after measures. **Video game:** GoldenEye 007 (Eurocom, 2010) **Console:** Wii	**State aggression -** Modified AQ (measured verbal and physical) (Buss & Perry, 1992) and Ambiguous story (Farrar & Krcmar, 2006)	Pre-game: risk taker, coactive, and inactive > risk avoiders Post- game: risk takers, coactive, and inactive > Risk avoiders	/	Unclear – not compared pre/post
3_1 Arriaga et al. (2015)	134 (135)	Student 18-48	66 F 68 M	Measuring dilatory response (PDR) as a measure of processing and responding emotionally to victims of violence. Measuring effects of PDR based on video game play and subsequent violent behaviour. **Video game:** Time Crisis 4 (Nex Entertainment, 2007) (violent) Need for Speed: Shift (2009) (non-violent)	**Aggressive behaviour** - CRTT (Taylor, 1967)	Violent > non violent	/	Y
					Physiological arousal - Skin conductance level measured during video game play	Not reported	Not reported	
					Emotional reaction to affective stimuli - International Affective Picture System (Lang, Bradley, & Cuthbert, 2005)	Negative context: violent < non-violent Neutral context: Not Significant Positive context: Not Significant	Not reported	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
				Console: PlayStation 3				
3_15 Mahood and Hanus (2015)	184	Student Range not reported Med. Age 20	78 F 106 M	Determine the effects of narrative on emotional state, as mediated by transportation into the narrative. 2 (character background: positive, moral actions vs. negative, immoral actions) x 2 (participant instruction: act as character would vs. no instruction) **Video game:** Fallout 3 (Bethesda Game Studios, 2008) **Console:** Xbox 360	**Aggressive behavioural tendencies** – adapted Tremblay and Belchevski (2004) vignettes	Rudeness: immoral > moral Use of threats: immoral > moral Physical force: immoral > moral Expressing anger: no difference Yelling: no difference	/	Y – immoral narrative
					Trait aggression - AQ (Buss & Perry, 1992)	Not reported	/	
					Emotional State – Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988)	Negative affect: immoral instruction > no instruction. No difference for moral	Not reported	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
					Transportation into the narrative – adapted Green and Brock (2000)	Mediated feelings of guilt	Behaviour: Not Significant Trait: Positive (mediated by empathy)	
					Trait transportation (Dal Cin, Zanna, & Fong, 2002)	Not reported (role of transportation)	Not reported	
3_16 McGloin, Farrar and Fishlock (2015)	488	Student Range not reported M 19.09 (SD 1.33)	~ 376 F ~ 109 M	Exploring the role of controller naturalness on aggression. Participants played game using either a low natural (standard controller) or high natural (gun controller) **Video game:** Time Crisis 4 (Nex Entertainment, 2007) **Console:** PlayStation 3	**Cognitive aggression -** Word blank task (Bushman, 1998)	Gun > normal	/	Y – natural controller
					Realism – modified scale for graphics (McGloin, Farrar, and Krcmar, 2013)	Gun > normal	Positive	
					Control naturalness – 13 items related to fire arm controlled modified from Skalski, Tamborini, Shelton, Buncher, and Lindmark (2011) and McGloin, Farrar, and Krcmar (2013)	Gun > normal	Positive	
					Immersion – 11 items based on McGloin, Farrar, and Krcmar (2011) and Skalski et al. (2011)	Gun > normal	Positive	
3_17 Mihan,	60	Student (Gaming	17 F 43 M	Investigate the effects of playing VVG under three	**Trait aggression –** AQ (Buss & Perry, 1992)	Not reported	/	Y – single player > co-op

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
Anisimowicz, and Nicki (2015)		specific) 19-26		conditions: single player, co-op multiplayer **Video game:** Call of Duty Modern Warfare 2 (Infinity Ward, 2009) **Console:** Xbox 360	**State hostility** -State Hostility Scale (SHS) (Anderson, Deuser, & Deneve, 1995)	Lacking positive feelings: increased – Single > co-operative Aggravating: increased – single > competitive Feeling unsociable: no difference Feeling mean: no difference	/	or competitive
					Stress - Post Stress Task Reaction Measure (Penley & Tomaka, 2002)	No difference once controlling for trait aggression and internet addiction	Not reported	
					Internet addiction - Internet Addiction Scale (Nichols & Nicki, 2004)	Not reported	Not reported	
3_20 Stermer (2014) – 2 studies reported	190	Student Range not reported	80 F 110 M	Exploring the role of character choice (as a measure of transportation into the game) and violent content on video game	**Aggressive Cognition -** Word completion task (Anderson, Carnagey, & Eubanks, 2003)	Blood: choice > no choice No blood: Not Significant	/	Y – blood and choice

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
		M 19.47 (SD 1.65)		outcomes 2 (character choice vs. no choice) x 2 (blood vs. no blood) design **Video game:** Mortal Kombat vs. DC Universe (Midway Games, 2008) **Console:** PlayStation 3	**Trait aggression -** AQ (Buss & Perry, 1992)	Not Significant	/	
					Transportation into narrative - State transportation scale – adapted from Green and Brock (2000)	Choice > no choice	Not reported	
	98	Student Range not reported M 19.31 (SD 1.80)	31 F 67 M	Does effect from study 1 extend to aggressive behaviour?	**Trait aggression -** AQ (Buss & Perry, 1992)	Not reported	/	Y – blood and choice
					Aggressive behaviour - CRTT (Taylor, 1967)	Duration: blood choice > no choice. Not Significant in no blood Volume: blood choice > no choice. Not Significant in no blood	/	
					Transportation into narrative - State transportation scale – adapted from Green and Brock (2000)	Choice > no choice Not Significant for blood	Not reported	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
3_22 Whitaker and Bushman (2012) – 2 studies, only one suitable for inclusion	150	Student Range not reported M 19.6 (SD Not reported)	81 F 69 M	Comparing the effects of violent, neutral, and relaxing video games on aggressive and prosocial behaviour. **Video game:** Endless Ocean (Arika, 2008) Fishing mini game in Legend of Zelda: Twilight Princess (Nintendo EAD, 2006) Super Mario Galaxy (Nintendo EAD Tokyo, 2007) Wii Sports Resort (Nintendo EAD Group No. 2, 2009) Resident Evil 4 (Capcom Production, 2007) No More Heroes (Grasshopper Manufacture, 2008) **Console**: Wii	**Aggressive behaviour -** CRTT (Taylor, 1967)	Violent > neutral < relaxing	/	Y
					Prosocial behaviour modified CRTT (Taylor, 1967)	Violent < neutral and relaxing	Not reported	
4_2 Drummond (2015)	100	Student 18-25	Male only	Exploring the role of solitary vs. co-operative play on aggression 2 (VVG vs non) x 2 (solo vs co-op) design **Video Game:** Gears of War 3 (Epic Games, 2011) (violent)	**Normative beliefs regarding aggression** - Normative Aggression Beliefs Scale (Anderson, Gentile, & Buckley, 2007)	Not reported	/	Y – content and single play
					Trait aggression - AQ (Buss & Perry, 1992)	Not reported	/	
					Aggressive behaviour - CRTT (Taylor, 1967)	content: Violent > non-violent across all	/	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
				Dirt 3 (Codemasters Southam, 2011) (non-violent) **Console:** Xbox 360		conditions Social: Not Significant Interaction: Not Significant		
					State hostility - SHS (Anderson et al., 1995)	Content: Violent > non violent Social: Not Significant Interaction: Not Significant	/	
					Aggressive cognition - Word Completion Task (Anderson et al., 2003)	content: Not Significant Social: single > co-op Interaction: Not Significant	/	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
4_10 Velez et al. (2014) – 2 studies reported, only one suitable for inclusion	126	Student (Gaming specific) Range not reported M 20.7 (SD 2.26)	~ 35 F ~ 91 M	Exploring the role of co-operative and competitive game play on aggression. Randomly paired and assigned to one of three conditions: co-op, competitive, and control (single player but after measures taken so no effect of the game). **Video game:** Halo: Reach (Bungie, 2010) **Console:** Xbox 360	**Aggressive behaviour -** CRTT (Taylor, 1967)	Competitive > co-op and neutral	/	Y - competition
4_6 Jerabeck and Ferguson (2013)	100	Student Range not reported M 21.21 (SD 4.75)	Not recorded	Exploring the interaction of content (antisocial or prosocial violence) and context (single or co-op) on video game playing outcomes 3 (antisocial VVG, prosocial VVG or non-violent game) x 2 (co-op or single player) design **Video game:** Borderlands (Gearbox Software, 2009) (violent antisocial) Lego Star Wars III: The	**Aggressive behaviour –** HSP (Lieberman et al., 1999)	Social: Solo > co-op Content: Not Significant	/	Y - solo
					Co-operative behaviour Prisoner dilemma game (Luce & Raifa, 1957)	Not Significant	Not reported	
					Empathy - Interpersonal reactivity index (IRI) (Davis, 1983)	Not Significant	Not reported	

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
				Clone Wars (Traveller's Tales, 2011) (violent prosocial) Portal 2 (Valve Corporation, 2011) (non-violent) **Console:** Xbox 360				
4_9 Valadez and Ferguson (2012)	100	Student 18-45	49 F 51 M	Explore whether VVG increases or decreases frustration 3 (VVG vs. non-violent vs. non-violent within a VVG) x 2 (15m vs. 45m play time) design. Participants frustrated to induce irritation before gameplay **Video game:** Red Dead Redemption (Rockstar San Diego, 2010) (Violent) FIFA 10 (EA Canada, 2009) (nonviolent) **Console**: Xbox 360	**State hostility -** SHS (Anderson et al., 1995)	Not Significant	/	N
					Depression - Beck Depression Inventory (BDI) II (Beck, 1996)	Not Significant	Not reported	
					Visuospatial cognition - Kaufman Brief Intelligence task (Kaufman & Kaufman, 2004)	Not Significant	Not reported	
5_3 Ferguson and Rueda (2010)	103	Student Not reported M 23.6 (SD	41 F 62 M	Exploring the role of social learning, mood management, and catharsis on video game effects.	**Aggressive behaviour -** CRTT (Taylor, 1967)	Not Significant	/	Y – cognitive N - behaviour

Study	Sample Size	Population Type and Age Range	Gender split (Female, Male)	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Yes / No)
		5.82)		Participants given a frustration task and then randomised to play VVG as a bad guy, VVG as a good guy, non-violent game, or no game to test theories. **Video game:** Hitman: Blood Money (IO Interactive, 2006) Call of Duty 2 (Infinity Ward, 2005) Madden NFL 07 (EA Tiburon & EA Canada, 2006) **Console:** Xbox 360	**Trait aggression -** AQ - short form (Buss & Warren, 2000)	Violent > non violent	/	
					State hostility - SHS (Anderson et al., 1995)	Not Significant	Behaviour: Not Significant Trait: Positive	
					Depression - BDI-II (Beck, 1996)	Not Significant	Behaviour: Not Significant Trait: Positive	

Appendix 12: Data Extracted from Non-Experimental Studies

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
1_2 Allahverdipour, Bazargan, Farhadinasab and Moeini (2010)	444	School 12-15	224 F 220 M	Exploring prevalence and correlated of video game playing in the Islamic Republic of Iran.	**Aggression -**Orpinas' aggression scale (Orpinas & Frankowski, 2001))	Initiation age: ns Length of time playing: Positive Years played: Not Significant	/	P – length of time playing
					Mental health status - Farsi version of General Health Questionnaire (Malakouti, Fatollahi, Mirabzadeh, & Zandi, 2007)	Initiation age: Positive Length of time playing: Not Significant Years played: Negative	Positive	
					Perceived side effects of video-computer games	Initiation age: Not Significant Length of time playing: Negative Years played: Negative	Not Significant	
1_3 Nije Bijvank, Konijn and	830	Child (gaming specific)	Male	Exploring education ability, video game preferences, and	**Trait aggression** - PA subscale of Buss and Perry (1992))	Violent game exposure: Positive	/	Y

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
Bushman (2012)		Range not reported M 13.9 SD 1.38		aggression.	**Sensation seeking** (Slater, Henry, Swaim, & Anderson, 2003)	Not reported	Not reported	
					Motivations	Not reported	Not Significant	
					Attractiveness of features of games	Not reported	Not reported	
					Education status	Not Significant		
1_4 Coyne et al. (2011)	287	children and their families (gaming specific) 11-16	~ 187 F 100 M	Examine the potential positive and negative outcomes of co-playing video games during adolescence	**Aggression**- self-restraint dimension of Weinberger, Schwartz, and Davidson (1979)	Age inappropriate: Not Significant VG use: Positive (female child report only) Co-playing: Negative (female mother and father report)	/	P – for female players, but co-playing mediates
					Internalising behaviour -depression/anxiety subscale (Barber, Stolz, & Olsen, 2005)	Age inappropriate: Positive (female only) VG use: Positive (male only) Co-playing: Negative (female only)	Mother report: Not Significant Father report: Not Significant Co-playing: Positive (child report only)	
1_7 Montag et al. (2011)	610 (1,202)	Gaming sample Range not	18 F 592 M	Replicating previous results of the role of self-directedness in relation to Internet	**Anger** – Anger scale of affective neuroscience personality questionnaire (Davis et al., 2003)	Positive	/	Y (modelling used for predicting IAT rather than

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
		reported M 19.32 (SD 4.40)		addiction and further explore the personality and makeup of FPS players	**Personality** – NEO Five-Factor Inventory German translation (Borkenau and Ostendorf, 1993)	N: Not Significant E: Negative O: Not Significant A: Negative C: Negative	N: Positive E: Not Significant O: Negative A: Negative C: Negative	gaming/anger outcome)
					Cooperativeness – TCI (Cloninger et al., 1993)	Negative	Negative	
					Self-directedness – TCI	Negative	Negative	
					Internet addiction – IAT (Widyanto and McMurran, 2004)	Positive	Positive	
					Life satisfaction – items from German Sociodemographic Economic Panel	Negative	Negative	
					Impulsivity – GSEP	Not reported	Not reported	
					Risk – GESP	Not reported	Not reported	
					Trust - GESP	Not reported	Not reported	
					Psychological wellbeing – GESP	Not Significant	Not Significant	
					Physical well-being – GESP	Not Significant	Not Significant	
					Frequency of sporting activities – GESP	Not reported	Not reported	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Smoking – GESP	Not reported	Not reported	
					Alcohol consumption – GESP	Not reported	Not reported	
					TV viewing – affinity towards horror or action films	Horror: Not Significant Affinity: Not Significant	Horror: Positive Action: Positive	
1_8 Yang (2012)	1069	Child (gaming specific) 7-18	~ 511 F 558 M	Explored the relationship between their gender, preference for video games, hostility, aggressive behaviour, experiences of cyberbullying, and victimisation.	**Hostility**	Direct: Positive Indirect: Not Significant	/	P – cognition directly, behaviour indirectly
					Aggressive behaviour	Direct: Not Significant Indirect: Positive	/	
					Cyberbullying	Direct: Not Significant Indirect: Positive	/	
					Cyber victimisation	Direct: Not Significant Indirect: Positive	H: Positive (direct only) A: Positive (direct only) C: Positive (direct only)	
2_2	4500	Mixed	~	Large scale telephone	**Physical aggression** - 2	A: Positive	/	P – PA for all,

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
Breuer, Festl and Quandt (2014)		(gaming specific) 14-89	1872 F 2628 M	survey for preference of shooter and action game in adolescents, young adults, and older adults	items from German translation (Herzberg, 2003) of AQ (Buss & Perry, 1992))	YA: Positive OA: Positive		anger in adolescents
					Anger - 2 items from German translation of AQ)	A: Positive YA: Not Significant OA: Not Significant	/	
					Verbal aggression - 2 items from German translation of AQ)	Not Significant	/	
					Self-efficacy - 5 items from General Self-Efficacy expectation scale (Schwarzer & Jerusalem, 1999)	Not Significant	PA: Not Significant A: Negative (YA and OA) VA: Positive	
					Social support – Berlin Social Support Scales (Schulz & Schwarzer, 2003)	A: Negative YA: NS OA: Negative	P: Negative (OA only) A: Not Significant VA: Positive	
					Education	Negative	PA: Negative A: Negative (YA only)	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							VA: Negative (YA and OA)	
2_6 Ferguson and Olson (2014)	377	School Range not reported M 12.93 (SD .76)	234 F 140 M 3 Not reported	Explore links between depressive symptoms and influence of exposure to VVGs selected based on raised attention deficit and/or depressive symptoms	**Trait aggression -** Attitudes towards conflict scale (Dahlberg, Toal, & Behrens, 1998)	Not reported	Delinquency: Positive Bullying: Positive	P – bullying attention deficit sample only
					Bullying behaviour – Revised Olweus Bullying / Victim Questionnaire (Olweus, 1996)	Depressive: Not Significant Attention deficit: Positive	/	
					Delinquency	Not Significant	/	
					Parental involvement	Not reported	Not Significant	
					Support from others - based on (Lerner et al., 2005; Phillips & Springer, 1992)	Not reported	Not Significant	
					Stress - The stressful urban life events scale (Attar, Guerra, & Tolan, 1994))	Not reported	Bullying: Positive (depressive only) Delinquency: Positive	
2_9 Hastings et al. (2009)	70	Children and parents 6-10	35 F 35 M	Parents reported on their oldest child (6-10 years) video game playing, school grades, and behaviour using	**Aggressive behaviour** Child behaviour checklist (CBCL) (Achenbach, 1991)	Total playing time: Positive Total violent games: Not Significant	/	P – total playtime only

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
				questionnaires		Exposure to violent games: Not Significant		
					Social context for gameplay	Not reported	Not reported	
					Parental monitoring	Not reported	Not reported	
					Attention problems – CBCL	T: NS VG: Positive E: Positive	/	
					School competence – CBCL	T: Negative (boys only) VG: Not Significant E: Negative	/	
					School performance	T: Not Significant VG: Not Significant E: Negative (boys only)	/	
					Delinquent behaviour CBCL	Not Significant	/	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
2_10 Janssen, Boyce and Pickett (2012)	9672 (8881)	Child (another study) 11-16	Not reported	Classroom-based questionnaire	**Violent behaviour -** Physical fighting (Brener, Collins, Kann, Warren, & Williams, 1995) or Bullying (Olweus, 1996)	Positive (only for F once adjusted for demographics and family affluence)		P – only for females
					Family Affluence - Family Affluence Scale (Currie, Samdal, Boyce, & Smith, 2001)	Not reported		
2_12 Leiner et al. (2014)	579	Child (gaming specific) 6-16	442 M 137 F	Exploring effects of socioeconomic status, video game habits (aggressive vs. non aggressive players), and psychosocial profile of Mexican American youths	**Externalising problems** - rule breaking and aggressive subscale of CBCL (Achenbach, 1991))	Aggressive games > non	/	Y- aggressive games higher
					Internalising problems - anxious/depressed, withdrawn depressed, and somatic complaints subscales of CBCL	Aggressive > non	Not reported	
					Social problems – CBCL	Not Significant	Not reported	
					Thought problems – CBCL	Aggressive > non	Not reported	
					Attention problems – CBCL	Not Significant	Not reported	
2_13 Moyer (2008)	195	School 5th Grade 10-11 8th Grade 14-15	91 F 104 M	Questionnaire study looking at the effects of video games on behaviour, based on motivations for playing	**Aggression -** student self-report –Peer Nomination of Aggression (Eron, Walder, & Lefkowitz, 1971) and the Direct and Indirect Aggression Scale (Björkqvist, Österman, &	Play: Positive (male only) Violence: Positive (male only)	/	P – male only

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Kaukiainen, 1992))			
					Positive social adjustment – Teacher reported prosocial behaviour, popularity, and social competence - Teacher predictions of Peer Nominations Scale (Huesmann, Eron, Guerra, & Crawshaw, 1994)	Play: Negative (males only) Violence: Positive females, Negative males	Not Significant	
					Negative social adjustment – teacher reported aggression, victimisation, and rejection – TPPNS (Huesmann et al., 1994)	Not Significant	Positive	
					Motivations for playing video games – prefer VG to friends, achievement, dominance, escapism, companionship, agency, social status (Barnett et al., 1997)	Play P: Positive A: Positive D: Positive (male only) E: Positive C: Positive Ag: Positive S Positive Violence P: Positive (male only) A: Positive (male only)	P: Positive (male only) A: Not Significant D: Positive (male only) E: Not Significant C: Not Significant A: Positive (male only) S: Positive (male only)	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
						D: Positive (male only) E: Positive (male only) C: Positive (male only) Ag: Positive S: Positive (male only)		
					Self-esteem/perceived competence - Harter Self-Perception Profiles (Harter, 1985))	Play: Negative (male only Violence: Not Significant	Negative (male only)	
					Peer Sociability- perceived social competence – HSPP, positive peer interactions – Friendship Questionnaire (Bierman & McCauley, 1987))	Not Significant	Not Significant	
					Perceived competence and peer sociability (cognitive and social competence - Teacher Rating Scale from HSPP)	Play: Negative (female only) Violence: Not Significant	Negative	
2_14 Müller et al. (2015)	12938 (13708)	School 14-17	6841 F 6097 M	Examining the prevalence of internet gaming disorder and internet addiction	**Internalising behaviour** (CBCL)	Positive	Not reported	Y – IGD higher
					Externalising behaviour (CBCL)	Positive	/	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
				across countries in Europe and the relationship between non-gamers, non-disordered, at risk, and internet game disordered participants	**Total Problems** (CBCL)	Positive	Not reported	
					Social competency (CBCL)	Negative	Not reported	
					Academic performance (CBCL)	Negative	Not reported	
					Activities (CBCL)	Negative	Not reported	
					Anxious-depressed (CBCL)	IGD > AR, ND, and NG	Not reported	
					Withdrawn-depressed (CBCL)	IGD > AR, ND, and NG	Not reported	
					Somatic complaints (CBCL)	IGD > AR, ND, and NG	Not reported	
					Social problems (CBCL)	IGD > AR, ND, and NG	Not reported	
					Thought problems (CBCL)	IGD > AR, ND, and NG	Not reported	
					Attention problems (CBCL)	IGD > AR, ND, and NG	Not reported	
					Rule-breaking behaviour (CBCL)	IGD > AR, ND, and NG	Not reported	
					Aggressive behaviour (CBCL)	IGD > AR, ND, and NG	Not reported	
2_15 Sigurdsson, Gudjonsson, Bragason, Kristjansdottir, and Sigfusdottir (2006)	433	College 15-25	242 F 191 M	Questionnaire study looking at the relationship of attitudes and personality characteristics with self-reported frequency of violent, nonviolent,	**Attitudes towards violence** - Maudsley Violence Questionnaire Walker, 2005)	Machismo: V > NV and NG Acceptance of violence: V > NV and NG	/	P – attitudes only, not behaviour
					Personality -Eysenck Personality Questionnaire	Psychoticism: V > NV and NG	Not reported	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
				and non-gamers	(Eysenck & Eysenck, 1975))	Extraversion: NS Neuroticism: NS		
					Impulsivity, Venturesomeness, and Empathy - Adult impulsivism, venturesomeness and empathy Questionnaire (Eysenck & Eysenck, 1991))	Not Significant	Not reported	
					Antisocial behaviour - Gough Socialisation scale (Megargee, 1972))	Not Significant	/	
3_2 Brady (2007)	319	Adult 18-20	140 F 179 M	Exploring links between media use (any, violent (institutional or interpersonal), or sports theme) and attitudes towards institutional aggression	**Attitudes toward interpersonal violence** (Funk, Elliott, Urman, Flores, & Mock, 1999)	Not Significant	/	P - sports theme linked to favourable aggressive attitudes
					Aggressive Personality - Physical aggression subscale of Buss and Perry (1992)	Not Significant	/	
					Attitudes towards punitive criminal justice policies - Penal Code Violence subscale of Attitudes towards Violence scale (Velicer, Huckel, & Hansen, 1989)	Any: Not Significant Institutional: Not Significant Interpersonal: Not Significant Sports: Positive	Not reported	
					Attitudes towards	Any: Not Significant	Not reported	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					military preparedness/defence – Violence in war subscale of ATVS	Institutional: Not Significant Interpersonal: Not Significant Sports: Positive		
					Attitudes towards aggressive military intervention - Violence in war subscale of ATVS	Not Significant	Not reported	
					Violence exposure with the home and community - The Community Experiences Questionnaire (Schwartz & Proctor, 2000)	Any: Not Significant Institutional: Not Significant Interpersonal: Not Significant Sports: Positive	Not reported	
					Constrained options for solving problems - Constrained Options subscale from the Reactive Responding Scales (Research Network on Socioeconomic Status and Health)	Any: Not Significant Institutional: Not Significant Interpersonal: Not Significant Sports: Positive	Not reported	
3_3 Choo et al. (20	2998	School	819 F 2179 M	Exploring pathological / non-pathological	**Hostile cognition** (Huesmann & Guerra,	Not Significant	/	N

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
(2010)		Range not reported M 11.2 (SD 2.06)		gaming in schools, looking at psychometric properties and links between constructs	1997)			
					Impulse control problems - Barratt Impulsiveness scale (Patton, Stanford, & Barratt, 1995))	Not Significant	Not reported	
					Social competence - Personal Strengths Inventory II (Liau, Chow, & Tan, 2008))	Not Significant	Not reported	
					Somatic complaints - general mental health survey (Crystal et al., 1994)	Not Significant	Not reported	
					Damages in functioning in self-care, family, peer interaction, and schooling - partially adapted from Charlton (2002)	Not Significant	Not reported	
					Intelligence - Raven's standard progressive matrices plus (Raven, Styles, & Raven, 1998)	Not Significant	Not reported	
3_4 Colwell and Kato (2005)	509	School UK Range not reported	259 F 250 M	Exploring the relationship between friendship, self-esteem, and aggression with video game play. Cross-cultural comparison between	**Aggression** (Dominick, 1984)	Frequency: Positive Duration: Positive Years: Positive (Japanese only)	/	Y

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
		Tokyo 12-13		UK and Japan ("the home of video game play")		Exposure: Positive		
					Self-esteem (Rosenberg, 1965))	F: Negative (UK only) D: Not Significant Y: Not Significant E: Not Significant	Not reported	
					Motivations	VG as companionship F: Positive (UK only) D: Positive (UK only) Y: Not Significant E: Positive (UK only) Prefer VG to friends F: Positive D: Positive Y: Not Significant E: Positive	Not reported	
3_5 DeLisi, Vaughn, Gentile, Anderson and Shook (2013)	227	Young Offenders 14-18	~ 102 F 125 M	Questionnaire study looking at the prevalence of video game playing in juvenile offenders and associated risk factors	**Serious violence** - Self-Report of Delinquency based on NYS (Elliot, Huizinga, & Ageton, 1985)	Violent: Positive Prosocial: Not Significant Years: Not Significant	/	P – violent games only
					Juvenile court onset	Not reported	NS	
					Psychopathy (Youth Psychopathic Traits Inventory (Andershed,	Not reported	Delinquency: Not Significant	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Kerr, Stattin, & Levander, 2002)		Violence: Positive	
					Delinquency - Self-Report of Delinquency based on NYS (Elliot et al., 1985)	Violent game: Positive Prosocial game: Not Significant Years: Not Significant		
3_6 Espinosa and Clemente (2013)	659	School 12-18	350 F 309 M	Middle class high school students asked to complete questionnaires in a classroom setting.	**Antisocial aggressive behaviour** (Espinosa & Clemente, 2011)	Involvement: Positive Violent: Positive	/	P – involvement not significant when adding control variables
					Self-transcendence (ST) - Motivational values questionnaire (Schwartz, 1992)	Negative	Negative	
					Self-oriented perspective (SOP)- Prosocial Tendencies Measure (Carlo & Randall, 2002)	Positive	Positive	
3_7 Ferguson, Colwell, Mlačić, Milas and Mikloušić (2011)	837	Student Range not reported Mexican-American M 18.57 (SD 1.95) English	~ 461 F 376 M	Exploring five factor model of personality as well as aggression as potential moderators of media violence effects across different cultures (232 Mexican American, 150 English, 455 Croatian)	**Trait aggression** - AQ (Buss & Perry, 1992)	Not reported	Positive (MA and C)	P – Violent crime in Mexican American sample only
					Violent crime - National Youth Survey (Elliot et al., 1985)	Positive (MA only)	/	
					Personality - International Personality Item Pool (Goldberg et al., 2006))	Not reported	A: Negative (E only C: Not Significant E: Not	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
		M 20.24 (SD 2.62) Croatian M 20.41 (SD 1.81)					Significant N: Negative (C only) O: Not Significant	
					Depression - Zung Depression Inventory (Zung, 1965)	Not Significant		
3_8 Ferguson et al. (2008)	355	Student Range not reported M 19.6 (SD 2.9)	187 F 168 M	Examine potential contributors to violent crime.	**Trait aggression -** AQ-Short Form (Buss & Warren, 2000)	Not Significant	/	N
					Violent Criminal Behaviour - NYS (Elliot et al., 1985)	Not Significant	/	
					General Personality - NEO-Five Factor Inventory (Costa and McCrae, 1992)	All not Significant	N: Positive (A only) E: Not Significant O: Not Significant A: Not Significant C: Not Significant	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Family violence exposure – physical abuse, domestic violence, spanking, verbal abuse (Family Conflict Scale, Ferguson et al., 2008)	All Not Significant	PA: Positive DV: Positive (V only) S: Not Significant VA: Positive	
					Alcohol and drug use	Not Significant	Not Significant	
					Education value	Not Significant	Not Significant	
					Parental affection	Not Significant	Negative	
					TV violence	Positive	Not Significant	
3_9 Ferguson, Olson, Kutner, and Warner (2014)	1254	School Range not reported M 12.9 (SD .76)	653 F 584 M	Focusing on behaviours of legal and social interest – delinquency, bullying, and aggression when angry examined as outcomes	**Trait aggression** - Attitudes Towards Conflict scale (Dahlberg et al., 1998)	Preference: Positive Exposure: Not Significant	Positive	P – trait aggression (preference only) and anger (exposure only)
					Bullying - Bullying perpetration scale of ROB/VQ (Olweus, 1996)	Not Significant	/	
					Aggression when angry	P: Not Significant E: Positive	/	
					Parental involvement	Not reported	NS	
					Support from others - based on (Lerner et al.,	Not Significant	Negative (delinquency	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					2005; Phillips & Springer, 1992)		and anger)	
					Stress - stressful urban life events scale (Attar et al., 1994))	Not Significant	Positive	
					Extracurricular activity involvement	Not Significant	Not Significant	
					Catharsis seeking	P: Positive E: Not Significant	Not Significant	
					Delinquency - based on (Brener et al., 2002; Elliot et al., 1985; Leffert et al., 1998)	Not Significant	/	
3_10 Ferguson, San Miguel and Hartley (2009)	603	Child 10-14	294 F 309 M	Examine predictive nature of multiple risk factors in youth violence and aggression with well-validated measures of aggression. Questionnaire assessment using both child and parent reports	**Aggression** - problematic behaviours reported by self, parent, and teacher from CBCL (Achenbach & Rescorla, 2001))	CR: Positive PR: Not Significant	/	P – aggression not predictive when combined with other measures. Bullying remained
					Bullying (Olweus, 1996)	Positive	/	
					Neighbourhood problems – NLE	Not Significant	A: Positive D: Positive B: Positive	
					Negative relations with adults – NLE	Positive	A: Positive D: Positive B: Positive	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Antisocial personality – NLE	Positive	A: Positive D: Positive B: Positive	
					Family attachment – NLE	Not reported	Not reported	
					Delinquent peers – NLE	Positive	A: Positive D: Positive B: Positive	
					Family environment (Moos & Moos, 2002)	Not Significant	A: Negative D: Negative B: Not Significant	
					Family violence -CTS	Not Significant	A: Positive D: Not Significant B: Positive	
					Rule-breaking behaviour – NLE	CR: Positive PR: Not Significant	A: Positive D: Positive B: Positive	
					Depression - withdrawal / depression scale of the CBCL	Not Significant	A: Positive D: Positive	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							B: Positive	
					Delinquent behaviour - general delinquency subscale of NLE (Paternoster & Mazerolle, 1994)	Not Significant	/	
3_11 Glascock (2014)	400	Student 18-26	252 F 148 M	Exploring possible demographical and sociological factors in the development of verbal aggression. Participants were given questionnaires to complete	**Verbal aggression -** Verbal Aggressiveness Scale (Infante & Wigley, 1986))	Exposure: Positive Exposure and content: Positive	/	Y
					Peer influence- affiliation with deviant peers scale (Elliot et al., 1985) – modified by Buehler (2006))	Not reported	Positive	
					Parental influence- modified version of Parenting Scale (Arnold, O 'Leary, Wolff, & Acker, 1993))	Not reported	Positive	
					Religiosity (Sullivan, 2001)	Not reported	Negative	
3_12 Holtz and Appel (2011)	205	School 10-14	105 F 100 M	Questionnaire study looking at relationships between patterns of internet and video game use and behavioural problems in early adolescence.	**Externalising problems –** aggression, rule breaking behaviour scales of CBCL (Achenbach, 1991))	Amount played: Positive Fantasy games: ns First person shooter games: Positive	/	P – amount played, FPS and online games

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
						Online games: Positive		
					Internalising problem - withdrawn, somatic complaints and anxious/depressed scales of YSR)	A: Not Significant F: Positive FPS: Not Significant O: Positive	Positive	
					Total problem - CBCL	A: Positive F: Positive FPS: Not Significant O: Positive	Positive	
					Internet use – amount and use (informational, communicational)	A: Positive (amount only) F: Positive (amount only) FPS: Not Significant O: Positive (amount and communication)	A: Positive I: Not Significant C: Positive	
					Parental knowledge – communication with parents	A: Not Significant F: Not Significant FPS: Not Significant	Negative	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
						O: Negative		
3_14 Lemmens, Bushman and Konijn (2006)	299	School 12-17	Male	Exploring what types of individuals are most attracted to VVG	**Aggressiveness** - PA subscale of AQ (Buss & Perry, 1992))	Time: Positive Violent: Positive Addiction: not reported	/	Y
					Empathy - empathic concerns subscale of Interpersonal Reactivity Index (Davis, 1983)	Not reported	Not reported	
					12 fictitious video game descriptions	Not reported	Higher aggression = violent preference	
3_19 Richmond and Wilson (2008)	86	Student Range not reported Male M 20.25 (SD 1.00) Female M 21.30 (SD 5.01)	35 F 51 M	Questionnaire study exploring the links between exposure to violent media, aggression, and moral disengagement	**Trait Aggression** - AQ (Buss & Perry, 1992))	Frequency: Positive Enjoyment: Positive	/	Y
					Moral Disengagement (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996))	F: Positive E: Positive	Not reported	
3_21 Swing and	422	Student	~ 257 F	Questionnaire study exploring the role of	**Aggressive cognitions -** Attitudes towards violence	Overall: Not Significant	/	P

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
Anderson (2014)		Range not reported M 19.30 (SD 1.75)	165 M	attention problems and impulsiveness on the effects of media violence	(Anderson, Benjamin, Wood, & Bonacci, 2006) and Control Aggression Schema (Warburton, 2007)	Violent: Positive		
					Attention problems and impulsive aggression - Adult ADHD self-report scale (Kessler et al., 2005) and Barratt Impulsiveness Scale (Patton et al., 1995)	Overall: Positive Violent: Positive	/	
					Anger and hostility – anger and hostility subscales of AQ (Buss & Perry, 1992)	Overall: Not Significant Violent: Positive	/	
3_24 You, Kim and No (2015)	1242	School 12-16	~ 495 F 731 M	Questionnaire study exploring how video games are related to aggressive and prosocial behaviours and whether the emotional competencies of adolescents, such as empathy, emotion regulation, and behavioural self-control mediate this.	**Aggression** - Suppression of Aggression subscale of the Weinberger Adjustment Inventory (Weinberger, 1990))	Positive	/	Y
					Empathy - Empathic Concern and Perspective Taking subscales of IRI (Davis, 1983))	Positive	Not Significant	
					Emotion regulation - items from Behavioural and Emotion Rating Scale (Epstein, 2004))	Not Significant	Negative	
					Behavioural Regulation - Child self-control rating	Negative	Negative	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					scale (Rohrbeck, Azar, & Wagner, 1991)			
					Prosocial behaviour - Adolescent Prosocial Behaviour Measure (Kumru, 2002)	Friends and family: Negative Strangers: Not Significant	F & F: Negative Strangers: Negative	
3_25 Zhen, Xie, Zhang, Wang and Li (2011)	795	School Range not reported Grade 5 M 11.63 (SD .59) Grade 8 M 14.82 (SD .59) Grade 11 M 16.80 (SD .59)	350 F 445 M	Questionnaire study testing three factors (beliefs about aggression, hostile expectations, and empathy) simultaneously mediate the relationship between playing VVG and physical aggression	**Physical aggression -** subscale of the AQ (Buss & Perry, 1992)	Positive (G5F, G8M, and G11My)	/	P – varies with age and gender
					Beliefs about aggression - part of Beliefs about Aggression and Alternatives Scale (Farrell, Meyer, & White, 2001)	Positive (G5, G8M, and G11)	/	
					Hostile Expectations (Bushman & Anderson, 2002)	Positive (G5 only)	/	
					Empathy - IRI (Davis, 1983)	Negative (G5 and G8F)	PA: Negative (G11M only) B: Negative (G5F, G8F, and G11M) H: Not reported	
4_1 Coyne et al. (2012)	2,666 (1,333 couples)	Adult (another study) 18-79	1333 F 1333 M	Questionnaire study looking at the prevalence of video game play in couples and conflict/aggression	**Relational aggression** (Carroll et al., 2010)	Not Significant	/	P – physical aggression
					Physical aggression - Conflict tactic Scale (Straus, Hamby, &	M: Positive (female report only)	/	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Warren, 2003)	F: Positive		
					Time problems	M: Positive F: Positive	RA: Positive PA: Positive	
					Content problems	M: Positive F: Not Significant	RA: Positive PA: Positive	
4_3 Exelmans, Custers and Van den Bulck (2015)	3372	Adolescent (another study) 12-18	1969 F 1403 M	Large scale questionnaire exploring impact of gaming (violent and non) on other known risk factors relating to delinquency	**Delinquent behaviour** - Self-Report Delinquency Measure of the NYS (Elliot et al., 1985)	All: Positive V: Positive NV: Positive	/	Y
					Sensation seeking - Brief Sensation Seeking Scale (Stephenson, Hoyle, Palmgreen, & Slater, 2003)	All: Positive V: Positive NV: Negative	Positive	
					Peer delinquency	All: Positive V: Positive NV: Negative	Positive	
					Prior victimisation	All: Positive V: Positive NV: Positive	Positive	
					Alienation - subscale of American Drug and	All: Positive	Positive	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Alcohol Survey (Oetting & Beauvais, 1990)	V: Positive NV: Not Significant		
4_4 Greitemeyer (2015) – 2 studies reported	225	Mixed Range not reported M 25.1 (SD 8.0)	162 F 63 M	Questionnaire study exploring whether everyday sadism would be positively associated with amount of VVG exposure	**Trait aggression -** short version of AQ (Bryant & Smith, 2001)	Positive	/	P – Y S1, N S2
					Everyday sadism - Comprehensive Assessment of Sadistic Tendencies (Buckels, Jones, & Paulhus, 2013)	Physical: Positive Verbal: Positive	Physical: Positive Verbal: Positive	
					Personality - brief Big Five (Gosling, Rentfrow, & Swann, 2003))	E: Not Significant A: Negative C: Negative N: Not Significant O: Not Significant	E: Not Significant A: Negative C: Negative N: Positive O: Not Significant	
	340	Mixed Range not reported M 24.2 (SD 7.0)	235 F 105 M	Questionnaire study exploring whether Dark Triad (psychopathy, narcissism, and Machiavellianism) will be related to VVG preferences	**Trait aggression** (same as study 1)	Not Significant	/	
					Everyday sadism (same as study 1)	Physical: Positive Verbal: Not Significant	Physical: Positive Verbal: Positive	
					Personality - short measure of Big Five (Rammstedt & John,	E: Not Significant A: Not Significant	E: Not Significant	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					2007)	C: Negative N: Not Significant O: Positive	A: Negative C: Negative N: Positive O: Not Significant	
					Dark triad – (Jonason & Webster, 2010)	N: Not Significant M: Positive P: Positive	N: Positive M: Positive P: Positive	
4_5 Gunter and Daly (2012)	6567	School 14-15	3215 F 2971 M	Estimate whether playing M rated games or nonviolent games produces real-life behavioural differences in overall and matched samples	**Violent deviant behaviour** – hit someone, group fight, carried a weapon, take a weapon, carried a gun, overall	M > NV (only female group fighting, carrying a gun and overall remained when matched)	Not reported	P – once matched only female remained problematic for some areas
					Non-violent deviant behaviour – cheated, skipped school, shoplifted, stole, vandalised, break and enter, overall	M > NV (only female skip school remained when matched)	Not reported	
					Substance misuse – cigarettes, alcohol, marijuana, overall	M > NV (NS matched – Marianna M < NV for boys)	Not reported	
5_1 Boxer, Huesmann,	820 (430 HS, 390 D)	Adolescent Range not	~ 325 F 475 M	Examine exposure to violent media (preference as a child	**Violent behaviour** - severe physical aggression scale	PC: Positive PN: Positive	/	Y

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
Bushman, O'Brien and Moceri (2009)		reported High School M 16.83 (SD .71) Young offenders M 15.55 (SD 1.53)		and now) in the larger risk matrix associated with violent and non-violent behaviour.	(Lefkowitz, Eron, & Walder, 1977), and parental measure			
					Status – school sample (0) or delinquent (1)	PC: Positive PN: Positive		
					General aggressive behaviour - - Physical aggression subscale of AQ (Buss & Perry, 1992), teacher predictions of peer nominations measure (Huesmann et al., 1994)	PC: Positive PN: Positive	/	
					Callous-unemotional traits - Inventory of callous-unemotional traits (Essau, Sasagawa, & Frick, 2006))	PC: Positive PN: Positive	Positive	
					Academic skills -Wide range achievement test (Wilkinson, 1993)	PC: Not Significant PN: Not Significant	Negative	
					Psychoticism - Depression and psychoticism subscales of the Brief Symptom Inventory (Derogatis, 1992))	PC: Not Significant PN: Not Significant	Positive	
					Exposure to neighbourhood Violence - Neighbourhood violence	PC: Positive PN: Positive	Child: Positive Current: Positive	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					subscale of Stressful Urban Life Events scale (Attar et al., 1994))			
					Exposure to low-level aggression - Experience of witness and being victimised measure (Boxer, Edwards-Leeper, Goldstein, Musher-Eizenman, & Dubow, 2003)	PC: Positive PN: Positive	Positive	
					Delinquent behaviour and conduct problems Delinquency Scale (Elliot et al., 1985), Conduct Problems subscale of Strengths and Difficulties Questionnaire (Goodman, 2001)	Not reported	Not reported	
5_2 DeCamp (2015)	6122 (6,567)	School 13-14	3177 F 2945 M	Using census data from large-scale study (Delaware School Survey) to examine the risk factors associated with violence compared to video games. Use of propensity score matching to create matched samples that can then be used in multiple regression analysis	**Violent behaviour** – hit someone, take a weapon to school/event, carry a gun	Males: Hit: Not Significant Weapon: Not Significant Gun: Not Significant Females: Hit: Positive (Not Significant with others) Weapon: Positive (Not Significant with others)	/	P – females, but not with other risks

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
						Gun: Not Significant		
					Exposure to violence	Not reported	Males: Hit: Positive Weapon: Not Significant Gun: Positive Females: Hit: Positive Weapon: Positive Gun: Positive	
					Impulsivity / self-control - sensation seeking scale (Zuckerman, 1979))	Not reported	Males: Hit: Positive Weapon: Positive Gun: Positive Females: Hit: Positive Weapon: Positive Gun: Not Significant	

Study	Sample Size	Type and Age	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Parental influence	Not reported	Males: Hit: Not Significant Weapon: Negative Gun: Not Significant Females: Hit: Negative Weapon: Not Significant Gun: Negative	
R1 8_1 Clemente, Espinosa and Vidal (2008)	93	School 13-18	51 F 42 M	Survey exploring the effects of socialisation on aggression (assumption that media provides poor socialisation → aggression)	**Aggression** -based on (Brodsky & O'Neal Smitherman, 1983; Seisdedos, 1988)	Interactive media: Positive (female only) (NS when mediated by gender and TV) Preference: Positive (male only)	/	P – preference for violent games

Appendix 13: Data Extracted from Longitudinal Studies

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
1_5 Ferguson (2011b)	302	Child 10-14	165 F 146 M	Use of clinical and criminological measures to improve on past designs	**Neighbourhood problems** - NLE	Not reported	A: Not Significant RB: Not Significant D: Not Significant B: Not Significant	P – bullying only
					Negative relations with adults - NLE	Not reported	A: Not Significant RB: Not Significant D: Not Significant B: Not Significant	
					Antisocial personality -NLE	Not reported	A: Not Significant RB: Not Significant D: Not Significant B: Positive	
					Family attachment - NLE	Not reported	A: Not Significant RB: Not	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							Significant D: Negative (VC only) B: Not Significant	
					Delinquent peers - NLE	Not reported	A: Not Significant RB: Not Significant D: Not Significant B: Not Significant	
					Delinquent behaviour – violent and non-violent criminal behaviour (NLE)	Not Significant	/	
					Family environment (Moos & Moos, 2002)	Not reported	A: Not Significant RB: Not Significant D: Not Significant B: Not Significant	
					Family violence – psychological aggression and physical abuse (CTS, (Straus et al., 2003)	Not reported	A: Positive (PsyA (PR only) only) RB: Positive (PsyA (PR only) only) D: Not Significant	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							B: Not Significant	
					Depressive Symptoms - (CBCL - YSR, (Achenbach and Rescorla, 2001)	Not reported	A: Positive RB: Positive D: Not Significant B: Positive	
					Aggression (A)-CBCL (parent report (PR) and youth self-report (YSR)	Not Significant	/	
					Rule breaking (RB) – CBCL (parent and YSR)	Not Significant	/	
					Bullying -Olweus Bullying Questionnaire (Olweus, 1996))	Positive (T1 and T2)	Negative	
1_6 Lemmens, Valkenburg and Peter (2011)	530 (540)	Child / Adolescent (gaming specific) 11-17	~ 260 F 270 M	Longitudinal questionnaire	**Physical aggression** - subscale of aggression questionnaire (Buss & Perry, 1992))	General: Positive (T1 and T2) Violent: Positive (T1 and T2)	/	Y
					Pathological gaming (Lemmens, Valkenburg, & Peter, 2009)	General: Positive (T1 and T2) Violent (T1 and T2)	Positive (T1 and T2)	
2_4 Ferguson,	333	Child / Adolescent	~ 172 F	Data collected from youths and parents.	**Delinquency** - NLE	Not Significant	/	N

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
Garza, Jerabeck, Ramos and Galindo (2013)		10-17	161 M	Analysed as both cross-sectional and prospective	**Rule-breaking behaviour** – CBCL	Not Significant	/	
					Clinically relevant aggression – CBCL (PR and YSR) (Achenbach & Rescorla, 2001))	Not Significant	/	
					Bullying - OBQ (Olweus, 1996))	Not Significant	/	
					Depression - withdrawal/depression scale of the CBCL)	Not reported	A: Positive RB: Positive D: Not Significant B: Not Significant	
					Parental supervision	Not reported	A: Not Significant RB: Not Significant D: Negative B: Not Significant	
					Parental depressive symptoms – BDI (Beck, 1996))	Not reported	A: Not Significant RB: Positive D: Not Significant B: Not Significant	
					Civic behaviour	Not Significant	Not reported	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Achievement test for reading, spelling, and math - Wide range achievement test-IV (Wilkinson & Robertson, 2006)	Not Significant	Not reported	
					Visuospatial cognition – matrices subscale of the Kaufman Brief Intelligence Test-II (Kaufman & Kaufman, 2004)	Not Significant	Not reported	
					Antisocial personality - NLE	Not reported	A: Not Significant RB: Positive D: Not Significant B: Positive	
					Family attachment – NLE	Not reported	A: Negative RB: Not Significant D: Not Significant B: Negative	
					Delinquent peers - NLE	Not reported	A: Not Significant RB: Not Significant D: Not Significant	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							B: Positive	
					Family violence - NLE	Not reported	All Not Significant	
2_5 Ferguson, San Miguel, Garza, and Jerabeck (2012)	165 (193)	Child 10-14	~ 83 F 82 M	Longitudinal data following a risk resilience approach, looking at other factors associated with youth violence as well as video game violence	**Serious aggression** - Childhood Behaviour Checklist (Achenbach & Rescorla, 2001))	Not Significant	/	N
					Dating violence -subscale of Conflict Tactic Scale (CTS) (Straus et al., 2003))	Not Significant	/	
					Neighbourhood problems - Negative Life Events, (Paternoster & Mazerolle, 1994))	Not reported	Not reported	
					Negative relations with adults - NLE	Not reported	Not reported	
					Antisocial personality -NLE	Not reported	A-CR: Not Significant A-PR: Not Significant DV: Not Significant	
					Family attachment - NLE	Not reported	A-CR: Not Significant A-PR: Not Significant	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
							DV: Not Significant	
					Delinquent peers - NLE	Not reported	A-CR: Not Significant A-PR: Not Significant DV: Not Significant	
					Family violence - CTS – (completed by caregivers)	Not reported	A-CR: Positive (Physical abuse only) A-PR: Not Significant DV: Positive (physical abuse only	
					Depression - Withdrawal/depression scale of CBCL)	Not reported	A-CR: Positive A-PR: Not Significant DV: Not Significant	
2_7 Gentile, Li, Khoo, Prot,	3034	School 8-17	~ 819 F 2215 M	Longitudinal study looking at video gaming habits and	**Aggressive behaviour** (Linder, Crick, & Collins, 2002)	Not Significant (unless mediated)	/	P – mediated by increased aggressive

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
and Anderson (2014)				aggressive behaviour	**Aggressive cognitions** - modified Normative Beliefs about Aggression (Huesmann & Guerra, 1997), Aggressive Fantasy Scale (Nadel, Spellmann, & Alvarez-Canino, 1996), and Hostile attribution scenarios (Crick, 1995)	Positive	/	cognitions and lowered empathy
					Empathy -Children's Empathic Attitudes Questionnaire (Funk, Baldacci, Pasold, & Baumgardner, 2004))	Negative	AB: Negative (Positive when mediated by aggressive cognitions) AC: Not reported	
					Parental Involvement - adapted from Adult Involvement in Media Scale (Gentile, Lynch, Linder, & Walsh, 2004) and Parent Supervision Scale (Abelman & Pettey, 1989))	Not reported	Not reported	
4_8 Möller and Krahé (2009)	295	School Range not reported M 13.34 (SD .83)	153 F 142 M	Questionnaire	**Normative beliefs about aggression** – modified version of (Krahé & Möller, 2004)	Physical: Positive Indirect / relational: Not Significant	/	Y
					Hostile attribution bias: four vignettes used	Physical: Positive Indirect/	/	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
						relational: Not Significant		
					Physical aggression -seven items from physical aggression subscale of German version of AQ (Buss & Perry, 1992))	Positive	/	
					Indirect aggression -Seven items from indirect aggression scale from AQ short (Buss & Warren, 2000))	Positive	/	
R1 5_1 Breuer, Vogelgesang, Quandt and Festl (2015)	276 (322)	Mixed (gaming specific) 14-21	~ 53 F 223 M	Longitudinal non-experimental investigation using a representative sample of German gamers	**Physical aggression -** 2 items from physical aggression subscale of AQ (Buss & Perry, 1992)	14-17: Positive 18-21: Not Significant	Not reported	P – 14-17 only
					Education	14-17: Not Significant 18-21: Not Significant	14-17: Negative (T1 only) 18-21: Negative (T1 only)	
R1 6_1 Bucolo (2010)	829 (933)	School 11-17	464 F 365 M	Self-report measures every six months over a three-year period Current study uses three data waves over a period of 18m	**Trait physical aggression** (5 items of physical aggression subscale of AQ (Buss & Perry, 1992))	Positive	/	Y – role of cognitions in mediating physical
					Normative status - approval of PA (Cohn & White, 1990)	T1: Positive (T1 VGV only) T2: Not Significant T3: Positive (T1 VGV only)	/	

Study	Sample Size	Type and Age (T1)	Gender split	Study Description	Measures	Relationship with video game	Relationship with externalising behaviour	(Violent) video games increase externalising behaviour? (Y/N)
					Physical aggression -eight items from National Youth Longitudinal Survey (Wolpin, 1983)	Positive (T1 and T2 VGV only)	/	

Appendix 14: Overview of the *No Russian* campaign in Call of Duty: Modern Warfare 2 (Infinity Ward, 2009)

Before the start of the mission, players hear the following dialogue:

> *"Two men took down an entire base. I ask much more from you now. Yesterday you were a soldier on the front lines. But today the front lines are history. Uniforms are relics. The war rages everywhere. And there will be causalities. This man Makarov is fighting his own war and he has no rules. No boundaries. He doesn't flinch at torture, human trafficking, or genocide. He's not loyal to a flag or a country or any set of ideals. He trades blood for money. He's your new best friend. You don't want to know what it's cost already to put you next to him. It will cost you a piece of yourself. It will cost nothing compared to everything you'll save."*

After this, players are warned about potentially 'disturbing content' and are required to choose whether to continue playing or skip the mission (see Fig. 1). They are also told that their actions will not effect the game or their playing statistics, which allows players to make a choice knowing they will not be penalised.

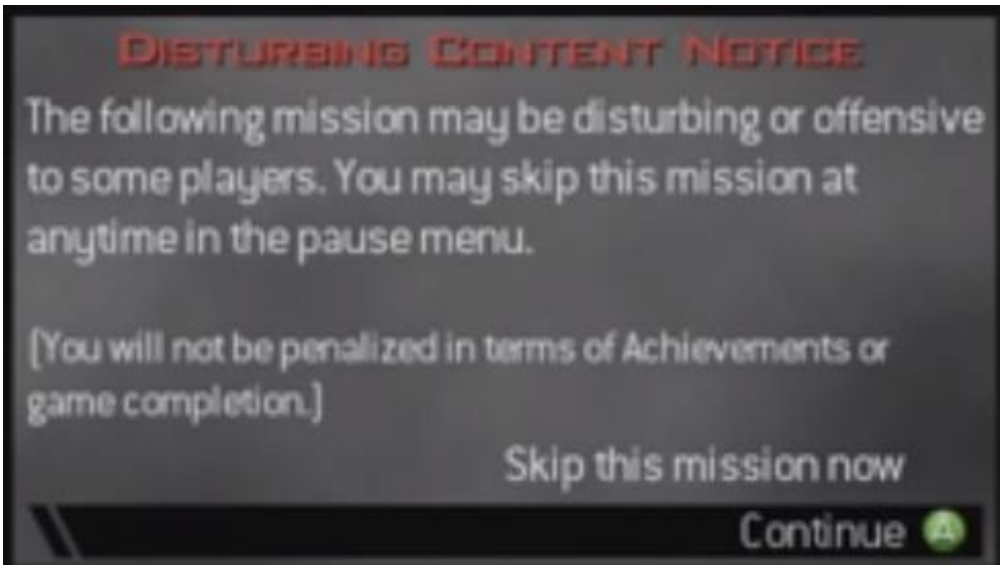


Figure 15: Disturbing Content Notice

If they chose to play, they are then presented with the instructions "follow Makarov's lead" (see Fig. 2) when the character Makarov and his team open fire on a busy airport.



Figure 16: "Follow Makarov's Lead"

The player has the choice whether to fire their weapon or not, but they have to follow the characters shooting, or the mission will not progress. Again, there are no consequences for the player whatever they choose – unless they try to shoot the perpetrators in which case the characters kill the player, and the mission counts as failed so must be replayed (see Fig. 3)



Figure 17: Mission Failure

Appendix 15: List of Internet Forums Contacted

Forum	Used	Comment
http://forums.activision.com/welcome	N	Offline at time of study
http://www.advancedwarfare.co.uk/forum/	N	No response
http://www.ahoyworld.co.uk/index	Y	
http://forums.anandtech.com/index.php	Y	
http://arstechnica.com/civis/viewforum.php?f=1	N	Not permitted
https://www.avforums.com/forums/	Y	
http://forums.bethsoft.com/	N	No response
https://susi.bigfishgames.com/confirm	N	No response
http://forums.bit-tech.net/	N	No response
http://www.bleepingcomputer.com/forums/	N	Not permitted
http://community.callofduty.com/community/call_of_duty	N	No response
http://www.callofduty-community.com/forum/	Y	
http://callofduty-forums.com/	N	No response
http://callofdutyforums.net/	N	No response
http://www.callofdutylive.com/	Y	
http://www.callofdutyzombies.com/forum/	N	No response
http://campernation.com/	N	No response
http://www.capcom-unity.com/go/network/forum	Y	
https://cevo.com/forums/	N	No response
https://www.cheapassgamer.com/index.php?app=forums	N	Requires post count
http://www.city-data.com/forum/video-games/	N	No response
http://clanofdeath.forumotion.com/privmsg	N	No response
http://www.cod247.com/	Y	
http://www.codaddicts.com/forums/forum.php	N	Offline at time of study
http://www.codboards.com/forums/index.php	N	No response
http://www.codforum.com/	Y	
http://www.codforums.com/	Y	
http://codscript.net/	Y	
http://www.computing.net/forum/gaming/1.html	N	No response
http://forums.computerandvideogames.com/index.php	N	No response
http://www.computerforum.com/	N	Required post count
http://www.co-optimus.com/forums/	N	Forum closed
http://customcombatgaming.com/forums/index.php?app=forums	Y	
http://eu.cybergamer.com/forums/	Y	
http://www.cyberpowersystem.co.uk/	Y	
http://forums.digitalspy.co.uk/	N	Not permitted
http://denkirson.proboards.com/	Y	
http://forum.destructoid.com/forum.php	Y	
http://www.doublefine.com/forums/	N	No response
http://www.d2jsp.org/	N	Not permitted
http://www.dslreports.com/instant	N	Not permitted

http://forum.dvdtalk.com/video-game-talk-15/	Y	
www.efestivals.co.uk	Y	
http://elitegamingcomputers.com/forum/	N	Not permitted
http://www.elitepvpers.com/forum/	Y	
https://forums.epicgames.com/forum.php	N	No response
http://www.escapistmagazine.com/forums/	N	Not permitted
http://www.eurogamer.net/	N	Not permitted
https://www.fanfiction.net/	N	Not reported
http://fearless-assassins.com/	Y	
http://www.fraggednation.com/forum/topics/general/Community-Announcements-22	Y	
http://fpsbomb.com/	N	Not permitted
http://www.fpsforum.net/index.php	N	Not permitted
http://fpsleague.org/forum/index.php	N	No response
http://www.frugalforum.co.uk/index.php	Y	
http://community.futuremark.com/forum/forum.php	N	No response
http://www.gameboomers.com/forum/ubbthreads.php	Y	
http://www.gameinformer.com/forums/default.aspx	N	No response
http://gamejolt.com/community/forums/	N	No response
http://www.gaming-forum.org/index.php	N	Not permitted
http://www.gamereplays.org/community/-discussions-Section.html	Y	
http://forums.gameservers.com/	N	No response
http://www.gamesforum.com/	Y	
http://www.gamespot.com/forums/	N	Not permitted
http://forums.gamesquad.com/forum.php	Y	
http://www.gametracker.com/forums/	N	No response
http://forums.gametrailers.com/	N	Not permitted
http://www.gaming-asylum.com/forums/	N	No response
https://gbatemp.net/forum/	Y	
http://forums.gearboxsoftware.com/index.php	N	Not permitted
https://forums.geforce.com/	Y	
http://www.giantbomb.com/forums/	N	Not permitted
http://www.gamerevolution.com/community	N	Not permitted
http://www.gfinity.net/forum#	N	No response
http://www.gpforums.co.nz/	N	post count needed
http://gtxgaming.co.uk/forum/	N	No response
http://www.gunslingergaming.com/phpbb/	N	Not permitted
http://www.hackforums.net/	Y	
http://hardforum.com/index.php	Y	
http://www.ign.com/boards/	N	Not permitted
http://www.insomniacgames.com/community/forum.php	N	No response
http://forum.irresistiblegaming.com/forum.php	N	No response
http://forum.justforfun-gaming.com/	N	No response
http://www.kongregate.com	Y	
http://konvictgaming.com/community/	N	No response
http://www.maximumpc.com/forums/viewforum.php?f=35	N	No response

http://www.minecraftforum.net/	N	Not permitted
http://www.mpgh.net/forum/index.php	N	No response
http://www.nintendolife.com/forums	N	Not permitted
http://n00bpwners.com/	Y	
http://www.newgrounds.com/bbs	Y	
http://www.neoseeker.com/forums/	N	No response
http://www.ng-gaming.net/forums/forum.php	N	No response
http://www.nextgenupdate.com/forums/	Y	
http://www.neogaf.com/forum/	N	Not permitted
http://www.officialplaystationmagazine.co.uk/forum/	N	Not permitted
http://www.officieelplaystationmagazine.com/	N	Foreign forum
http://www.theoldergamers.com/forum/	N	No response
http://forums.overclockers.co.uk/	N	No response
http://www.ownedcore.com/forums/	Y	
http://www.pcadvisor.co.uk/forums/26/games/	N	Not permitted
http://www.pcgamer.com/forum/	N	Site offline
http://www.pcgaming-forum.com/forum.php	N	Not permitted
https://www.pcmasterrace.net/index.php	Y	
http://www.pcpro.co.uk/forum/viewforum.php?f=21	N	Forum closing
https://www.pcspecialist.co.uk/forums/	N	Not permitted
http://community.eu.playstation.com/t5/English-Forums/ct-p/55	N	No response
http://community.us.playstation.com/	N	American site
http://www.playstationcollecting.com/forum/	Y	
http://forums.penny-arcade.com/	N	Not permitted
http://forums.playstationlifestyle.net/	N	No response
http://www.ps3chat.com/	N	Not permitted
http://www.playstationleague.co.uk/forum/index.php	N	No response
http://www.playstationtrophies.org/forum/	Y	
http://www.ps3hax.net/forum.php	N	Not permitted
http://ps3trophies.com/forums/forum.php	N	Required PlayStation Network account
http://ps4forum.com/	Y	
http://www.ps4news.com/forums/	N	No response
http://psindependent.com/	N	Offline at time of study
https://www.psu.com/forums/forum.php	N	Not permitted
http://psvitaforum.com/	N	No response
http://psx-scene.com/forums/	N	Not permitted
http://www.pwnem.com/index.php	N	No response
http://www.racketboy.com/forum/	Y	
https://www.reddit.com/r/CodAW/	Y	
https://www.reddit.com/r/CallOfDuty	Y	
http://relapsedclan.com/forums	N	No response
http://www.retrocollect.com/forum/	N	No response
http://www.rockpapershotgun.com/forums/for	N	Not permitted

um.php		
http://roosterteeth.com/forum/	N	No response
http://forum.rpg.net/forum.php	Y	
http://forums.screwattack.com/index.php	Y	
http://www.se7ensins.com/forums/	Y	
http://forums.eu.square-enix.com/forum.php	Y	
http://forums.steampowered.com/forums/	N	No response
http://swiftor.com/	Y	
http://www.tacticalgaming.net/hq/	N	No response
http://teambeyond.net/forum/	N	No response
http://www.teamplayergaming.com/forum.php	Y	
http://www.techwatch.co.uk/	N	No response
http://www.tech-pc.co.uk/forum/	N	Not permitted
http://www.techpowerup.com/forums/	Y	
http://www.techsupportforum.com/forums/	N	No response
http://teknogods.com/phpbb/index.php	N	No response
http://www.telkomgamingforum.co.za/index.php	N	No response
http://forums.thedigitalfix.com/forums/index.php	N	No response
http://www.thestudentroom.co.uk/forum.php#navforums	Y	
http://www.theverge.com/forums/gaming	N	No response
http://www.thetechgame.com/Forums.html	N	No response
http://think-clan.com/	No	No response
http://forums.totalxbox.com/	N	No response
http://www.tunngle.net/community/	N	No response
http://forums.ubi.com/forum.php	N	Not permitted
http://ubuntuforums.org/forumdisplay.php?f=93	N	Not permitted
http://unionvgf.com/index.php?forums/	Y	
http://www.unknowncheats.me/forum/	N	No response
http://videogamesawesome.com/forums/	Y	
http://www.vgf.com/forums/	N	Not permitted
http://vgmdb.net/forums/index.php	Y	
http://www.videogamemm.com/forums/index.php	Y	
http://videogamegeek.com/forums/region/3/video-game	Y	
http://community.videogamer.com/forums/	N	Required post count
http://www.video-game-forums.com/	N	Not permitted
http://www.warlizardforum.com/index.php	N	Not permitted
http://forum.webuser.co.uk/	N	No response
http://forums.whirlpool.net.au/forum/8	N	Not permitted
http://forums.xbox.com/xbox_forums/default.aspx	N	Not permitted
http://www.xboxachievements.com/forum/	Y	
http://www.xbox-360.co.za/forum/forum	N	No response
http://xboxamerica.com/forums	N	US only
http://www.xbox360forum.com/xbox-forum/forum.php	N	No response
http://www.xbox360iso.com/	Y	
http://www.xboxlivefan.org/	N	Required post

		count
http://www.xboxoneforums.net/	N	No response
http://www.xboxplayers.com/forum/	N	No response
http://www.xboxworld.com.au/forum/	N	Australian only

Appendix 16: Demographic Questionnaire

Thank you for following the link. Before taking part in the study, please answer the following background questions:

Gender:
☐ **Male** ☐ **Female**

Age:
☐ **7 or under** ☐ **8 – 11** ☐ **12 – 14** ☐ **15 – 17** ☐ **18 – 20** ☐**21 – 30**
☐**31 – 40** ☐**41 – 50** ☐**51 – 60** ☐**61-70** ☐**71-80** ☐**80+**

What is your employment status?
☐ **Full-time** ☐ **Part-time** ☐ **Student**
☐ **Retired** ☐ **Unemployed**

In which country do you live? (Choose from drop down)

Appendix 17: *No Russian* Questionnaire

Please answer the following questions relating to the video game *Call of Duty: Modern Warfare 2*

Each question would show one at a time, depending on the response given

Have you played the videogame Call of Duty: Modern Warfare 2?
☐ **Yes** ☐ **No** *(ends questionnaire, debrief page shown)*

Did you choose to skip or play the campaign "No Russian"?
☐ **Play** ☐ **Skip**
☐ **I do not remember the campaign** *(ends questionnaire, debrief page shown)*

What influenced your choice?

The games storyline ☐ **Yes** ☐ **No**
If yes: Did this make you want to play it more or less? ☐**More** ☐**Less**

The "disturbing content" warnings in the game ☐ **Yes** ☐ **No**
If yes: Did this make you want to play it more or less? ☐**More** ☐**Less**

Media coverage about the campaign ☐ **Yes** ☐ **No**
If yes: Did this make you want to play it more or less? ☐**More** ☐**Less**

My parents ☐ **Yes** ☐ **No**
If yes: Did this make you want to play it more or less? ☐**More** ☐**Less**

My friends ☐ **Yes** ☐ **No**
If yes: Did this make you want to play it more or less? ☐**More** ☐**Less**

If Skip: Why did you chose to skip the campaign?
☐**I did not want to play it due to the disturbing content**
☐**I did not have time to play it**
☐**I wanted to play it at a later date**
☐ **Other reason:**

If Play: Did you fire your weapon at any point in the campaign?
☐ **Yes** ☐ **No**

If Yes: Why did you fire your weapon?
☐ **It was part of the story**
☐ **To see what would happen**
☐ **To kill civilians that had been badly injured**
☐ **To take part in the undercover operation**
☐ **To practice shooting**

☐ **To kill people**
☐ **Other reason:**

If No: Why did you choose not to shoot at the civilians?
☐ **Did not want to kill civilians**
☐ **It made me feel uncomfortable**
☐ **Did not have to do it**
☐ **Did not want to waste ammo**
☐ **Wanted to watch the action**
☐ **Other reason:**

Continue to next section

Show sources of information page

Appendix 18: Video Game Experience Questionnaire

How long have you been playing videogames?
☐ **Less than one year** ☐ **1 – 5 years** ☐ **5 – 10 years** ☐ **More than 10 years**

How many hours a week do you spend playing videogames?
☐ **Less than 5 hours** ☐ **5 – 10 hours** ☐ **10 – 20 hours** ☐ **20 hours or more**

Appendix 19: Project Proposal

The aim of the current study is to examine whether morality acts as a mediator between violent videogame players being more aggressive in their day-to-day lives or not. It is an important area to investigate as there continues to be a divide in research between those who believe VVGs cause harmful effects (Bushman and Anderson, 2001) and those who argue that they do not (e.g. Ferguson and Kilburn, 2010). While both research fields produce more insight in to the field, it often does more to polarise opinion rather than contribute towards a greater understanding of the effects of violent media consumption.

The most commonly cited theory for explaining the effects of VG violence is the General Aggression Model. Proposed by Bushman and Anderson (2001), it aimed to tie various theories of aggression into a working model. Applied to VGs, the model suggests that repeated exposure to VVGs will lead to an increased aggressive personality through priming aggressive cognitions, increasing arousal and creating aggressive states (Anderson and Bushman, 2002). However, this theory does not explain the effects of other variables known to be linked to aggression, and causes polarisation in views, with some claiming it proves that VVGs cause real world violence and aggression (Huesmann, 2007), and others highlighting that many people play violent games but are not violent (Kurtner and Olson, 2008). To address this, Gentile and Bushman (2012) have proposed the application of the risk and resilience theory of aggression. They argue that aggression is complicated process and no one factor causes or prevents it, therefore VGs should be seen as one of many risk factors. This, they highlight, helps to explain why not all people who play VGs become aggressive, as they are likely to have few other risk factors and more protective factors.

This study aims to look at the effects of morality and empathy as a mediator between engaging in immoral violent behaviour in VVGs. Björkqvist and Österman (2000) concluded in their review that empathy has been demonstrated to mediate the effects of aggression. Similarly, Jolliffe and Farrington (2004) found in their systematic review that lower levels of empathy are found in offenders than controls. Therefore, this could be a possible useful mediator to explore in the media violence debate. Funk, Buchman, Jerks and Bechtoldt (2003) found that in that children who had been playing VGs for a longer period of time had a decreased level in empathy and morality compared to those who had not. This was also linked to their aggression and attitudes towards violence. Similarly, Bartholow, Sestir and Davis (2005) found that empathy worked as a mediator between the effects of exposure to VG violence and aggressive behaviour. In their recent meta-analysis, Anderson and colleagues (2010) explored the effects of empathy and desensitisation and found a significant effect of exposure to violent videogames reducing empathy across all types of study designs. With regards to morality, Gabbiadini, Andrighetto and Volpato (2012) explored the levels of moral disengagement in people who have played the VG Grand Theft Auto and those who have not and found higher levels of moral disengagement in these gamers than in controls. Gabbiadini, Riva, Andrighetto, Volpato and Bushman (2013) found similar results, but also examined alongside real world acts of immoral behaviour, such as self-control, cheating, and aggression and found that those who played a violent game were more likely to engage in all of these behaviours. Based on this, one could

assume that those who act immorally in the game, are more likely to be aggressive than their moral counterparts.

While many VGs offer moral choices, they are often tied to an outcome so the consequences are clear and the player is either rewarded or punished for their actions. (Whitty, Young and Goodings, 2011). In the *No Russian* campaign of the popular violent game *Call of Duty: Modern Warfare 2*, players are faced with a decision of whether to observe or engage in a terrorist act. Players are warned about potentially disturbing content before they play and told that their actions will not affect the game or their playing statistics, which allows players to make a choice knowing they will not be penalised. If they chose to play, they are then presented with another choice, whether to observe or take part in the campaign. Again, there are no consequences for the player whatever they choose – unless they try to shoot the perpetrators in which case the mission counts as failed and must be replayed. This allows for an exploration of the differences between those who chose to take part, as well as an opportunity to compare three types of gamers: those who avoid, observed, or took part and to examine if there are any differences between them regarding empathy, personality, motivations for playing games and their aggressive cognitions.

This study proposes to explore the difference in motivations, personality, aggression, and empathy between VVG players based on their moral choices. It is anticipated that those who chose to engage in the terrorist attack will be more aggressive and have lower empathy. It is anticipated that this study will hope to explore the differences in motivations for playing and personality traits between the VG players to develop knowledge on the protective and risk factors for aggression related to engagement in VVG play.

Research questions:

1. Will players who chose to engage in the scene differ in term of aggression compared to those who chose not to play or observe?
2. Will players who chose to engage in the scene differ regarding empathy compared to those who chose not to play or observe?
3. Will the players differ regarding personality traits?
4. Will the players differ regarding motivations for playing VGs?
5. Will these factors combined lead to increased levels of aggression?

Method

Sample: Based off predicted effect sizes for VVGs and aggression (r=.183, Anderson et al. 2010), empathy (r=-0.188, Anderson et al. 2010), and moral disengagement (r=0.148, Gabbiadini, Andrighetto and Volpato, 2012), the study will involve approximately 1000 participants who have played *Call of Duty Modern Warfare 2*. Participants will be recruited from VG forums, with permission gained from moderators before advertising.

Design: cross sectional online questionnaire design, comparing those who have observed and those who took part in the controversial scene "No Russian".

Measures: the study will measure morality, motivations for playing, personality, violent cognitions and empathy.

Morality will be measured by asking participants how they played out the chapter "No Russian" in the game with the response of: observed (did not fire weapon at all) or participated (fired weapon at some point the chapter). If participants answered with "participated" they will then be asked how much they fired their weapon: fired at the gun men to try and stop them, fired weapon only at the start to see what would happen, fired occasionally in the scene, and fired weapon throughout the scene.

The other measures will be measured using questionnaires:

1. *VG Motivations (Bijvank, Konijn, and Bushman, 2012)* – 22 item questionnaire measured on a 7 point likert scale focusing on 7 areas of motivations for playing VGs: social interaction, competition, escapism, arousal, unwind, and diversion.
2. *Aggression Questionnaire (Buss and Perry, 1992)* **-** 29 questions split into four categories: physical aggression, verbal aggression, anger, and hostility. Each question is answered on a 5-point likert scale
3. *Interpersonal Reactivity Index (Davis, 1980)* - measurement of empathy using four subscales: perspective taking, fantasy, empathic concern and personal distress. 28 questions measured on a 5 part likert scale
4. *Big Five Inventory (John and Srivastava, 1999)* – 44 item measurement of the Big Five Factors of personality (Goldberg, 1993) measured on a 5 point likert scale

Appendix 20: Original Ethics Application

Application form

Faculty of Medicine & Health Sciences (FHMS) Research Ethics Committee

Application for approval of all studies involving **Healthy Human Volunteers only conducted by Staff and Students of the University of Nottingham**

Please complete in typewritten form one application form, one detailed study proposal (template attached, consent form (template attached) and subject's information sheet (template attached), and supply 1 one signed hard copy and e-mail 1 copy as pdf attachments.

1 Title of Project:

Exploring the characteristics of violent video game players based on moral choices in the video game *Call of Duty: Modern Warfare 2*

Short title for use in footers of documents (i.e. Dynamic study): Moral choices in violent video games

2 Names, Qualifications, Job Title, Work Address, telephone, and email of Researchers:

Chief Academic/Supervisor: Professor Kevin Browne: Director of Centre for Forensic and Family Psychology, Faculty of Medicine and Health Sciences; Room B25 Yang Fujia Building, Jubilee Campus, Wollaton Road, Nottingham, NG8 1BB; 01158232210, kevin.browne@nottingham.ac.uk

Co-supervisor: Dr Shihning Chou: Lecturer in Forensic Psychology, Faculty of Medicine and Health Sciences; Room B32 Yang Fujia Building, Jubilee Campus, Wollaton Road, Nottingham, NG8 1BB; 01158 466623, shihning.chou@nottingham.ac.uk

Students name, Division, School and course: Rhianon Phillips, Division of Psychiatry and Applied Psychology, School of Medicine, Forensic Psychology – Top-up Programme DForenPsy

3 Type of Project: (Please select one or more from list below and delete as appropriate)

PhD Student project (please state which course) **Forensic Psychology – Top up Programme DForenPsy**
Questionnaire-based study
Focus Group/Interviews
Study involving Children

4a Summary of Experimental Protocol

Background: VVGs have been linked to increases in aggression (Anderson and colleagues, 2010), decrease in empathy (Funk, Buchman, Jerks and Bechtoldt, 2003), and decrease in moral choices (Gabbiadini, Andrighetto and Volpato, 2012). With moral choices being included in VGs, this allows for an exploration of player's choices and their characteristics to see if there is any link between types of players, their choices in the game, and real world aggression. This would help to propel the media violence debate away from arguing the existence of any effects towards exploring the condition for any such effects and thus how to safeguard people from them. The game to be used in this study is Call of Duty: Modern Warfare 2 with the campaign "No Russian" being used as the moral choice, with participants divided between those who actively took part, observed, or skipped the campaign.

The "No Russian" campaign is a campaign that has been voted the most controversial moment in the Call of Duty series (Mirror Online, 2013). It places the player in an undercover mission working with Russian terrorist who attack a Russian airport. The player is unable to prevent the attack and must walk through the scene with the gunman, choosing to either passively watch or actively take part by killing civilians. The consequences of the campaign are the same no matter what the player chooses and there is no record of the player's actions allowing for a unique insight into player's free choice and moral behaviour in a VG.

Aims and Hypothesis: The aim of the current study is to examine whether morality acts as a mediator between violent videogame players being more aggressive in their day-to-day lives or not. The research questions for the study are:

1. Will players who chose to engage in the scene differ in term of aggression compared to those who chose not to play or observe?
2. Will players who chose to engage in the scene differ regarding empathy compared to those who chose not to play or observe?
3. Will the players differ regarding personality traits?
4. Will the players differ regarding motivations for playing VGs?
5. Will these factors combined lead to increased levels of aggression?

Experimental Protocol and Methods: The study will entail an online questionnaire, involving 1000 participants, who have played the VG Call of Duty Modern Warfare 2.

Participants will be recruited from relevant VG forums (please see Appendix 1 – Forum List) where they will be presented with a link for the online survey. On clicking the link, they will be shown a form for gathering basic demographic details before choosing to take part in the study (see Appendix 2 – Demographic Details). This will help to analyse the numbers who follow the link but chose not to take part in the study. After they have chosen to take part, they will be shown a participant information sheet (see Appendix 3: Participant Information Sheet) which will give details of the study. Participants will then be required to give their consent before starting the questionnaire. One they have given their consent they will be presented with the questionnaire, which comprises of questions measuring morality (based on the choice in the game) motivations for playing, personality, aggression, and empathy.

Measurable End Points/Statistical Power of the Study: previous studies have produced relatively small effect sizes (r=.143 – 0.188) which

is why a large sample is being used based off power calculations from these studies

Key References:

Anderson, C.A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Rothstein, H. R., and Saleem, M. (2010) Violent Video Game Effects on Aggression, Empathy and Prosocial Behaviour in Eastern and Western Countries: A Meta-Analytic Review, Psychological Bulletin, 136 (2), 151-173

Funk, J. B., Buchman, D. D., Jenks, J. and Bechtoldt, H. (2003) Playing Violent Videogames, Desensitisation, and Moral Evaluation in Children. Applied Developmental Psychology, 24, 413-436

Gabbiadini, A., Riva, P., Andrighetto, L., Volpato, C., and Bushman, B. J. (2013) Interactive Effect of Moral Disengagement and Violent Video Games on Self-Control, Cheating, and Aggression, Social Psychology and Personality Science, 0, 1-8

Wynick, A. (2013, Nov 05) Call of Duty Anniversary: Top 10 Most Controversial Moments of Violent Shooter Game, Mirror Online. Retrieved from http://www.mirror.co.uk/news/technology-science/technology/call-duty-anniversary-top-10-2487234)

4b Lay Summary of project (in lay words) :(maximum 200 words) Summaries which include **language which is too technical for lay members of the Committee will be rejected.**

A study examining the characteristics of people who have played a popular VVG to see if there are differences in real world aggressive behaviour, personality, and motivations for playing violent videogames based on a moral choice in the game. The level examined places the player in an undercover operation where they must observe a terrorist attack in an airport. The moral choice is whether players chose to skip the level entirely, observe the attack as a member of the group or to take part in the attack (i.e. kill unarmed civilians) all of which are permitted and bare no consequence on the outcome of the game. It is anticipated based on the media violence literature that those who chose to take part in the attack will be more aggressive and have lower levels of empathy than those who did not, and will differ regarding personality and motivations for playing violent videogames than other players.

5 Duration of Study: Six months

6 Location of Study: Online questionnaire

Proposed starting date: April 2014
Proposed finishing date: October 2014

7 Description and number of volunteers to be studied: 1,000 people (including young people and children) who have played the video game Call of Duty: Modern Warfare 2

8 Will written consent be obtained from all volunteers? Yes

Please give the name, status, and relevant qualifications of the person who will give a verbal explanation and obtain consent.
Completed online

9 Will a disturbance allowance be offered? No

If Yes, give rate (*delete as appropriate)

*Per day: *Per study:

*Per procedure: *Give the maximum allowance payable to a volunteer:

10 Will a medical supervisor be present: No

If Yes, give name and qualifications:

11a Does the study involve the exposure of the patient to radioactive materials? No

If your project involves the administration of radioisotopes your attention is drawn to note 10 a) in the attached notes of guidance.

Radiological Practitioner/ARSAC certificate holder

Name Signature* What is the total effective dose

*The Radiological Practitioner/ARSAC certificate holder must sign to accept responsibility for the radiological procedure listed above.

It is the responsibility of the investigator to ensure that the total exposure of a volunteer to ionising radiation will not exceed 5 mSv over any 12 month period.

The Radiation Protection Adviser (RPA) must sign below to confirm that the dose estimate is satisfactory and that the appropriate arrangements are in place for undertaking the procedure.

RPA Name Signature Date

11b Does the study involve the exposure of the patient to X-rays? No

Type of procedure:

All research involving radiology must be submitted and approved by the Clinical Director for Radiology.

RPA Name Signature* What is the total effective dose

Clinical Director Name Signature Date

12 Will participant's General Practitioners be told about the study? This would be regarded as essential if the study includes consumption of drugs or novel chemical entities or if you are recommending that the volunteer should see their GP as a result of the study.

No

If no please justify

13a 1. If the procedure involves any intervention or treatment (blood sampling, biopsy , i.v injections, manipulation etc) does the practitioner performing this intervention or treatment have personal profession negligence insurance

N/A

2. <u>If the procedure involves new drug, formulation or device, will full insurance cover be provided by the sponsoring drug firm?</u>

N/A

If Yes, **See Guidelines Note 1: <u>Insurance</u>**

Proof of indemnity and a copy of the company's certificate of insurance should be forwarded for consideration at the same time as the application and protocol.

13b <u>FUNDING</u>

Will there be any material benefits from the study for the Department or individual investigator? (E.g. equipment, research salaries, consumables etc)

No

If yes please specify in general terms what the benefits will be:

13c <u>Trust R&D</u>

Does the study involve any staff who hold a contract with the hospital trust?(This does not include investigators with an honorary contract with the NHS but does include staff whose salary is provided by the NHS eg Nurse, radiographer, physiotherapist)

No

Will the study use any space/facilities/ resources belonging to the hospital trust? (eg Xray, pathology, blood tests other than those used to screen volunteers).

No

If you answer yes to both of the above questions please complete and submit the online QMC Trust R&D form available at the following links: <u>http://intranet/sQMCInfo/Divisions/Others/R&D/index.htm</u> or <u>http://www.qmc.nhs.uk/research/index.htm</u>.

14a <u>Drugs or other substances to be administered (including placebo and comparators)</u>

None

Please tick where appropriate

CSM status ☐ Product Licence (PL) ☐
Clinical Trials Authorisation (CTA) ☐

- For drugs with a product licence please append a copy of the relevant data sheet.
- For drugs with a CTA, please append a statement detailing present knowledge of the drug action, adverse effects, long and short-term safety.
- The number of the PL, CTA MUST be included.

If a new drug formulation is being studied an explicit statement as to the UK licensing status of the product is required. For unlicensed products then information should be given as to its licensing status in other countries and appropriate safety data should be submitted.

Arrangements for the supply, storage and dispensing of trial drugs must be discussed with the Senior Pharmacist at the relevant hospital who must sign below.

14b Will any drug used be stored in the Pharmacy and dispensed to a prescription written in red?

N/A

If No, please explain why:

Signature of Pharmacist ……..

Printed Name ……
NB THIS MUST BE OBTAINED

15 Does the project involve painful/dangerous or invasive procedures on volunteers?

No

Please outline risks and degree of discomfort

16 Will blood samples or other specimens be required? **No**

If so, will written informed consent be obtained?

What volume will be required and over what duration?*

*Studies involving venepuncture only, where the information generated is of no prognostic significance, will be approved by Chairman's action provided no more than a total of 500mls of blood is taken over a 6 month period and no more than 200mls is taken on a single occasion. Applicants need to submit 1 copy of this form and other documentation with a covering letter to the Chairman.

17 How will the subjects be chosen? Please specify what criteria will be used and which groups you wish to target.

Participants will be able to take part as long as they have played the VG Call of Duty: Modern Warfare 2. If they have not played the game the, questionnaire will end and a debrief sheet will be shown. All ages and

genders will be able to take part, the only exclusion criteria is whether participants have played the game.

Participants will be approached by creating a new thread on the forum (after permission has been granted from the moderators) with the attached advert.

Please include a copy of your proposed poster or advert

Please see an advert for forum administrators and an advert for the forum (see Appendix 4 - Adverts)

18 Describe how possible participants will be approached?
Please refer to note 9 in the Guidelines. Please specify whether posters will be used and where they will be placed.

Participants will be recruited using online VG forums, with adverts placed in new "threads". To target as many participants as possible, VG forums will be approached based on search engine results and permission sought from moderators and administrators.

Please see attached list of identified forums (see Appendix 1 – Forum List).

**** If your study is community-based or epidemiological study please answer the following questions (19-21)

19 What sources of information will be included? (tick any that apply)

Personal interview	[ ]☐
Postal questionnaire**	[ ]
Hospital records	[ ]
GP records	[ ]
Occupational records	[ ]
Other, describe	online questionnaire

**** Please submit a copy of your proposed questionnaire if you are a student please make sure your supervisor has reviewed and approved it.**

20 Whose permission will be sought to access this information (eg GP, consultant)?

N/A

21 For interview surveys only:

Please indicate who will do interviews (eg Students, research nurses etc)
Please submit an interview schedule including an outline of questions or topics to be discussed.

The questionnaire will be online so will be self-guided with written instructions provided on the participant information sheet and at the start of each section.

The questionnaire is made up of five different measures:

1. **"No Russian" Outcome (see Appendix 5: No Russian Questionnaire)**
   Contains four questions to confirm if participants have played and determine their actions in the game
2. **Motivations – Video Game Motivations (Bijvank, Konijn and Bushman, 2012) (see Appendix 6 – Motivations Questionnaire)**
   It contains 22 questions split into seven categories: social interaction, competition, fantasy – escape, fantasy – arousal, unwind, challenge, and diversion. Each question is answered on a seven point likert scale
3. **Empathy – Interpersonal Reactivity Index (Davis, 1980) (see Appendix 7 - Empathy Questionnaire)**
   28 questions split into four categories: perspective taking, fantasy, empathic concern, and personal distress. Each question is answered on a 5-point likert scale.
4. **Aggression – Aggression Questionnaire (Buss and Perry, 1992) (see Appendix 8 – Aggression Questionnaire)**
   29 questions split into four categories: physical aggression, verbal aggression, anger, and hostility. Each question is answered on a 5-point likert scale
5. **Personality – Big Five Inventory (John and Srivastava, 1999) (see Appendix 9 – Personality Questionnaire)**
   44 item inventory that measures the Big Five Factors of personality (Goldberg, 1993): extraversion, agreeableness, conscientiousness, neuroticism, openness. Each question is answered on a 5-point likert scale

Please see attached full psychometrics with references for each scale.

Participants will then be presented with a debrief sheet explaining the study and providing sources of support (See Appendix 10 – Debrief Sheet)

22 <u>What ethical problems do you foresee in this project?</u>

Based on: The British Psychological Society (2013) Ethics Guidelines for Internet-Mediated Research. Available: http://www.bps.org.uk/sites/default/files/documents/conducting_research_on_the_internet-guidelines_for_ethical_practice_in_psychological_research_online.pdf Accessed 04/12/13

<u>Verifying identity:</u> As the research involves anonymity of participants, verifying correct identity of participants is not required. However, it is important to include only participants who have played Call of Duty: Modern Warfare 2, therefore participants will be asked to confirm this and will be excluded from the study if they have not. There is a possibility that players may lie about this, but they will be asked further questions about the specific campaign, which will hopefully reduce this risk. However, as the BPS notes, it is impossible to verify people's identity on the internet without going to extreme lengths e.g. checking VG account histories. Furthermore, any attempts to verify the player's memory of the game will be limited as the game is five years old and may not be remembered in detail; however, the scene was rated as the most controversial moment in

the franchise's history so will be more likely to be remembered than the storyline itself.

It is also important to ensure that correct ages are obtained to prevent data being contaminated, therefore multiple age brackets will be used, including ones for under 18's.

Understanding of Public and Private Space: Only data obtained from the questionnaire will be used in the study; no data or information from the forums will be included. The forum will only be used for the recruiting of participants and no further communication with participants will take part on the forums, including prompting people to take part or 'thread bumping'.

Informed consent: All participants will be required to answer a compulsory "question" confirming that they consent to take part in the questionnaire. If they do not tick the box, the questionnaire will not continue. Should the participant find a way to bypass this, their data will not be included as the data set will record the answer they have given.

Participants will be provided with an information sheet to describe the basics of the study to allow participants to make a choice as to whether they wish to take part or not. The information sheet will include a brief synopsis of the research and contact details of the researchers if participants wish to contact them. At the end of the sheet, they will be presented with a compulsory question before starting the study.

All age ranges will be able to take part in this research as while the game is an over 18, no reference to the content (e.g. YouTube videos, scripts etc.) will be provided meaning that any age will be able to take part, assuming they have already played the game. This will help to address concerns that under 18's could access the study regardless and confound the data, as well as giving an insight into the number of under 18's that access and play age inappropriate games.

Levels of Control: There is no way to guarantee participants will be able to focus their attention on the questionnaire, however there are no time restraints so participants will be able to take as long as they require so it does not impact on their lives too much. Participants will be informed on the information sheet how long the questionnaire should take to complete.

As the research is questionnaire based the participants do not require supervision or support from the researcher.

There will be settings on the online survey to prevent people from re doing the research on the same computer; however, this will not prevent people from doing it on other computers.

Withdrawal: Participants will be informed at the start of the survey that they have the right to withdraw from the study at any point by closing the survey window or clicking a button at the bottom of each page to withdraw from the study. The debrief page will appear if they chose to end the survey.

Participants will be provided with the contact details of the researcher; however, participants will be informed that once they have submitted their

answers they will not be able to withdraw their data due to the anonymity of the research.

Debriefing: A debrief page will be displayed at the end of the survey, either once the questionnaire has been completed or after the participant has withdrawn. The page will include more detailed information about the purpose of the study, as well as sources of further information or support if the participants require it

By having the page appear if participants chose to leave the study it will ensure that all participants have access to this information.

Participants will be informed that they can have a summary of the research findings sent to them if they wish, but will have to contact the researchers to ask for this. The email address of the student will be provided on the participant information sheet and debrief page.

Deception: participants will be informed that the study will be exploring motivations for playing videogames, which while that is true, it is not all that is being looked at. This is necessary due to not wishing to upset participants before they take part in the study, risking causing participants to feel accused of being 'violent' or 'aggressive' due to high profile news reports linking crimes to VGs.

Monitoring the consequences of research: Due to asking about participant's aggression and empathy, it is possible that this will upset participants who feel persecuted to due to choosing to play VVGs. While there will be a debrief sheet to explain the reasons and help to address any upset or confusion, there is the possibility participants may close the page and therefore not see the debrief sheet. To provide participants with support, the contact details will be on the participant information sheet, the forum advert, and the debrief sheet.

Protecting participants and researchers: participants will be informed of the basic details of the study on the forum advert and this participant information sheet. This will also include the average length of time to complete the study so participants know in advanced how much time they are giving up.

To allow participants to not answer certain sections, questions will not be compulsory and will allow the study to continue until the end even if no responses are given. At the analysis stage, responses with a large number of missing variables will be removed, but may be used for descriptive statistics if there are patterns of missing data.

Participants will be approached on an online forum, with permission from the administrators to protect from "spamming" possible participants using messaging services such as email or in game messaging services.

To maintain profession boundaries, new profiles will be set up on the various forum sites specifically for recruiting participants. The researcher's university email will be provided as a contact address rather than personal emails.

To protect participants from the possible negative effects of the psychometrics, appropriate advice and support services will be available on the debrief pages

Data protection: all data obtained will be anonymous and not identifiable to individual participants. Data will be stored securely on the researcher's computer, a backup device and with the university. Participants will be informed of how long the research data will be kept and reminded that their data will not be identifiable nor will it be possible to remove their data due to the anonymity.

Confidentiality: the data will be collected using an internet survey website, and while this may be compromised their name will not be taken to preserve their anonymity, and participants will give their age rather than date of birth

Copyright: all data will be gathered from the questionnaire so will not cause any copyright problems. All questionnaires used are readily available on line and there will be no inclusion of game play content.

Any other relevant information?

DECLARATION: I will inform the Medical School Ethics Committee as soon as I hear the outcome of any application for funding for the proposed project and/or if there are any significant changes to this proposal. I have read the notes to the investigators and clearly understand my obligations as to the rights, welfare and dignity of the subjects to be studied, particularly with regard to the giving of information and the obtaining of consent.

Signature of Lead Investigator: **Date:**

****Nb If you are student your supervisor must sign this form otherwise it will be rejected**

Name and e-mail address for correspondence with applicant:

Appendix 21: Confirmation of Ethics Approval

Direct [mail]
+44 (0) 115 8232561
Louise.Sabin@nottingham.ac.uk

The University of Nottingham

Faculty of Medicine and Health Sciences

Research Ethics Committee
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham
NG7 2UH

11th July 2014

Rhiannon Phillips
Trainee Forensic Psychologist
c/o Dr Shihning Chou
Room B32 YANG Fujia Building
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

Dear Rhia

Ethics Reference No: CFPB10042014 SoM PAPsych – please always quote
Study Title: Exploring the characteristics of violent game players based on choices in video game *Call of Duty: Modern Warfare 2*
Lead Investigator: Rhia Phillips, Trainee Forensic Psychologist, Doctorate in Forensic Psychology Course, School of Medicine
Chief Investigators/Supervisors: Professor Kevin Browne, Director of Centre for Forensic and Family Psychology, Dr Shihning Chou, Lecturer in Forensic Psychology, Psychiatry and Applied Psychology, School of Medicine
Duration of Study: 04/14-10/14 6mths **No of Subjects** 1,000

Thank you for your response to the issues raised by the Committee dated 23rd June 2014 and the following revised documents were received:

Choices in Violent Video Games:

- FHMS REC Application Form, version 2, date 23/06/2014
- Proposal version 1, 23.06.2014
- Appendix 1 – Forum List, 23/06/2014
- Appendix 2 – Demographic Details 23/06/2014
- Appendix 3a - Participant Information Sheet over 16 16/05/2014
- Appendix 3b – Participant Information Sheet under 16/05/2014
- Appendix 4 – Under 16 consent 23/05/2014
- Appendix 5 – Under 16 Age 16/05/2014
- Appendix 6 – Adverts 23/06/2014
- Appendix 7 – No Russian Questionnaire 23/06/2014
- Appendix 8 – Motivations Questionnaire 23/06/2014
- Appendix 9 – Empathy Questionnaire 23/06/2014
- Appendix 10 – Aggression Questionnaire 23/06/2014
- Appendix 11 – Personality Questionnaire 23/06/2014
- Appendix 11a – Debrief Sheet – over 16
- Appendix 11b – Debrief Sheet – under 16

These have been reviewed and are satisfactory and the study is approved.

Approval is given on the understanding that the Conditions of Approval set out below are followed.

1. You must follow the protocol agreed and inform the Committee of any changes using a notification of amendment form (please request a form).

The University of Nottingham

2. You must notify the Chair of any serious or unexpected event.
3. This study is approved for the period of active recruitment requested. The Committee also provides a further 5 year approval for any necessary work to be performed on the study which may arise in the process of publication and peer review.
4. An End of Project Progress Report is completed and returned when the study has finished (Please request a form).

Yours sincerely



Dr Clodagh Dugdale
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

Appendix 22: Amendments to Ethics Application

Miss Rhia Phillips
C/O Dr Shihning Chou
Room B32 YANG
Fujia Building
Jubilee Campus
Wollaton Road
Nottingham NG8 1BB
[email]
[contact number]

Dear Dr Dugdale,

Addendum to Ethics Application (reference: CFPB10042014 SoM PAPsych)

I am writing to request to make changes to my initial ethics application which was approved on the 11th of July 2014. The changes are

- Please can the duration of the study be extended until October 2015. This was an oversight in the initial application and has not been enough time to gather the required participants due to difficulties in recruitment. Based on my power analysis I require 1,000 participants, however I have less than 50 so far.
- Following on from that point, I would like to request to extend the recruitment procedure to include: o General internet forums rather than limiting it to the ones initially identified (while still following the procedure laid out in the initial application)
    - Student population by contacting both the student's union and administrators of each department and ask them to forward the study information on to their students.
    - Word of mouth, by encouraging participants to pass on the study details to others once they have completed it
    - Use of social media to advertise the page on my own personal pages and encourage others to share it as well.

It is hoped by doing this I will be able to reach the required number of participants. As the study requires all participants to have played a certain game to take part, the selection process of participants should have minimal effect on the outcome.

- Appendix 7 – No Russian Questionnaire – please can a question be added to ask participants how old they were when they first played the game. This is because the game was released four years ago which may mean that participants were under age at the time of playing, but may be over the age limit when completing the questionnaire. This is based on feedback from the pilot study.

Yours sincerely,

Rhia Phillips
Trainee Forensic Psychologist
Yr 3 DForenPsy, University of Nottingham

Under the supervision of:

Dr Shihning Chou
Forensic Psychologist and Assistant Professor in Forensic Psychology
University of Nottingham

Prof. Kevin Browne
Professor of Forensic Psychology and Child Health
University of Nottingham

Appendix 23: Confirmation of Approval of Amendments

The University of Nottingham

Direct line/e-mail
+44 (0) 115 8232561
Louise.Sabir@nottingham.ac.uk

Faculty of Medicine and Health Sciences

Research Ethics Committee
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham
NG7 2UH

22nd December 2014

Rhiannon Phillips
Trainee Forensic Psychologist
c/o Dr Shihning Chou
Room B32 YANG Fujia Building
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

Dear Rhia

Ethics Reference No: CFPB10042014 SoM PAPsych – please always quote
Study Title: Exploring the characteristics of violent game players based on choices in video game *Call of Duty: Modern Warfare 2*
Lead Investigator: Rhia Phillips, Trainee Forensic Psychologist, Doctorate in Forensic Psychology Course, School of Medicine
Chief Investigators/Supervisors: Professor Kevin Browne, Director of Centre for Forensic and Family Psychology, Dr Shihning Chou, Lecturer in Forensic Psychology, Psychiatry and Applied Psychology, School of Medicine
Duration of Study: 04/14-10/15 18mths **No of Subjects** 1,000

Thank you for you letter dated 13th November 2014 notifying the Committee of amendment no 1 dated 13th November 2014 as follows:

- Time extension with a new end date of 31st October 2015 in order to achieve recruitment target.
- Widen recruitment strategy to include more groups than initially identified in the application but still using the procedure as approved.
- Appendix 7 – No Russian Questionnaire – Based on feedback from the pilot study addition of question to ask participants how old they were when they first played the game.

These have been reviewed and are satisfactory and the study amendment no 1 13th November 2014 is noted and approved.

Approval is given on the understanding that the Conditions of Approval set out below are followed.

1. You must follow the protocol agreed and inform the Committee of any changes using a notification of amendment form (please request a form).
2. You must notify the Chair of any serious or unexpected event.

The University of Nottingham

3. This study is approved for the period of active recruitment requested. The Committee also provides a further 5 year approval for any necessary work to be performed on the study which may arise in the process of publication and peer review.
4. An End of Project Progress Report is completed and returned when the study has finished (Please request a form).

Yours sincerely

CMDugdale

Dr Clodagh Dugdale
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

Appendix 24: Letter for Administrators and/or Moderators

I am Doctorate student at the University of Nottingham conducting research looking at the differences in motivations, personality, and behavioural outcomes based on choices made in VGs. The study will be conducted online using a questionnaire which I would like to advertise using your forum.

https://www.surveygizmo.com/s3/1752216/MW2

I have received ethical approval from the University of Nottingham ethics board. Participants need to have played Call of Duty Modern Warfare 2 as the choice concerns their actions in the campaign "No Russian".

If you are happy for me to go ahead and advertise this, please let me know where best to place the advert, otherwise I will use my best judgement. I will make it clear in the advert that I will only appear on the forum to advertise the study and will not return to "thread bump" or respond to any comments on the thread – all correspondence should be through the email address provided in the questionnaire.

If you wish to contact me in person rather than through this messaging thread, my academic email is [email].

Many thanks

Rhia Phillips

Appendix 25: Advert for Forum

Gamers!
I am recruiting participants to take part in a research study I am conducting as part of my Doctorate in Forensic Psychology. The study is looking at the differences in motivations, personality differences, and behavioural outcomes based on choices made in VGs. **Participants need to have played Call of Duty Modern Warfare 2.** If you would like further details or to take part in the study, follow the link below:

https://www.surveygizmo.com/s3/1752216/MW2

The questionnaire should take no more than 20 minutes to complete

Please be aware, to prevent "thread bumping" I will not be replying to anything else posted on this thread. If you wish to contact me to discuss the study, please use the contact details provided from the study page.

Thank you for taking the time to have a look at this post.

Appendix 26: Participant Information Sheets

Over 16

I am conducting a study looking at the different choices players make in VGs and how this may or may not be linked to the players motivations for playing, personality, and behaviour in the real world. The study involves completing a questionnaire containing scales measuring these factors. The questionnaire should take no more than 15 minutes to complete.

Participants must have played the VG Call of Duty: Modern Warfare 2 to take part.

By taking part in this study, you will be helping to develop more knowledge about the individual characteristics of VG players, to help researchers understand more about how the effects of VGs vary depending on the individual player. The answers and results obtained will be anonymous and no identifiable data will be collected. All data will be kept confidential and securely stored, with access for researchers and supervisors only. The results of the study will be used for academic purposes (e.g., project write up, publications). You have the right to withdraw from this study by not submitting the completed questionnaire and / or simply closing your browser window. However, once your data has been submitted, there will be no way to identify your responses from the rest of the participants. This is because the data will be analyses as a whole rather than looking at individual cases, so you will be unable able to withdraw from the study once you have completed the questionnaire.

There are some questions in this questionnaire that focus on your own participation in acts that you may find distressing. You do not have to answer any questions which you do not feel comfortable with. A list of help lines will be provided at the end of this questionnaire should you need them.

A debrief section with sources of support will be available at the end of this survey. Should you choose to not complete the survey, the debrief section can be accessed by clicking the Sources of Information link at the bottom of each page If you have any questions or comments, please email: [email]

Under 16

I am doing a study looking at the different choices players make in VGs. The study uses lots of questions to look at different topics which are: choices players make in VGs, why they play VGs, what they are like as a person, and things that they do in the real world. The questions should take no more than 15 minutes to answer.

To take part, you must have played the VG Call of Duty: Modern Warfare 2

By taking part in this study, you will be helping me to collect information about how playing VGs may effect people. The study will not ask for your name and there will be no way to link your answers to you. You're answers will be put together with everyone else's and they will all be looked at together. The only people who will look at the answers will be me and my teachers from the University. All of the answers will be kept

safe and only used for this study - which will be written up as a report and may be put in a book for others to read if they are interested. You do not have to take part in this study. You can choose not to take part at any point of the study by not finishing the questions or closing the internet page. However, once your answers have been given in, there will be no way to find out which ones were yours. You cannot ask to take your answers back once you have finished.

There are some questions which may ask you about things you have done that you may not want to answer. You do not have to answer any questions that you do not want to. At the end of the study there will be a some names of places you can call or visit online to talk to if you have been effected by the topics in the study. These are also available at the end of each page if you want to see them while you are answering the questions.

At the end of the questionnaire there will be some information which will explain the study in a little more detail for you, along with the places to call or visit online. If you have any questions or comments, please send an email to: [email]

Appendix 27: Measurement of Consent

Please read the following information sheet and decide whether you wish to take part in the study

Click to open participant information sheet (opens in new window)

☐I give my consent to take part in the following study
☐I do not wish to take part in the following study

If no, please state your reasons why in the box below

If under the age of 16

I have read the participant information and would like to take part in this study.
☐Yes ☐No

I understand that as I am under 16 I will need my parent/guardian's permission to take part
☐Yes ☐No

Parent/Guardian: As your child is under 16, they require your permission to take part in this research. If you have not seen it already, please read through the participant information sheet (Under 16 information (*links to information sheet)*| Over 16 information (*Links to information sheet)*) to be fully informed of what your child is taking part in

If you require any extra information, please email
[email]

PLEASE NOTE: Please do not give any indication as to whether you have granted consent or not as this would risk the confidentiality of the responses

I have read the participant information sheet and give permission for my child to take part in this research
☐Yes ☐No

Once consent obtained How old are you?
☐Under 7 ☐7 – 11 ☐13 - 15

Appendix 28: Debrief and Sources of Information

(To be shown only if all applicable sections have been completed or participant chooses to end the questionnaire)

Over 16

This study is examining the relationships between different moral choices (choosing whether or not to take part in a terrorist act in a VG) and personality types, motivations for playing VGs and aggressive thoughts, beliefs or actions. The purpose of this study is to focus on the differences between people's choices in games and examine if there are any differences in aggression, personality or motivations for playing between these types of players rather than comparing gamers and non-gamers to prove or disprove that games make people aggressive.

By using the chapter "No Russian", there is the opportunity to examine 'moral choices' made by players without any reward or consequence to the story line. There are examples of moral choices in many VGs, however most are tied to game outcomes or there is a heavy implication of what the player should chose. The difference with the "No Russian" campaign is that the player is free to decide a. whether to take part in the campaign at all (they can skip it before it starts) and b. whether to observe or take part in the airport shooting without any consequence to the story, rewards, or player stats. This allows for a more realistic moral choice to be made by the player.

By submitting your data, you will no longer be able to withdraw from this study as all responses are anonymous. The data is confidential and will be used for research purposes only.

If you have any further queries about this study, please contact [email]

If you wish to be emailed a summary of the research findings, please [email]

If any part of this questionnaire has caused you distress or raised issues of concern, below are details of various helplines, advice centres and charities that can provide support and information.

Samaritans
A general advice line for help and support about a variety of issues
08457 90 90 90
http://www.samaritans.org/

British Association of Anger Management
An advice line for anger management help in Britain.
0845 1300 286
www.angermanage.co.uk

PEGI (Pan European Game Information)
PEGI's advice section of their website, offering a "Good Gaming Guide"
http://www.pegi.info/en/index/id/24

Under 16

This study is looking at the differences in VG players based on the choices they make when playing VGs, to see if certain choices are linked to being more violent as a person. The study looked at the difference in their reasons for playing games; what players are like as a person; and how they think, feel, or do in the real world. Other studies look at the differences between people who play violent games and people who do not to see if VGs make them violent, but this study is looking at the differences in peoples choices in the game to see if there is a difference in what they do in the real world.

The chapter "No Russian" gives players the chance to make a choice about take part in a violent act (the airport shooting) in the game without any reward, punishment, or change to the story line. Lots of VGs use choices like this, but they are usually tied to the story or there are hints for the player about what they should do. The difference with the "No Russian" campaign is that the player is free to decide whether to take part in the campaign at all (they can skip it before it starts) and whether to watch or take part in the shooting without any effect on the story, rewards, or player statistics. This allows for the player to make the choice themselves, rather than do what the game hints at.

As you have finished the study, you cannot ask for your answers to be removed from the study. This is because all of the answers are kept together and are not linked to the person who took part. The data will be kept safe and will be written up as a report, which may be put in a book for other people to see if they are interested.

If you have any further questions about this study, please email [email]

If you wish to be emailed a summary of the results of the study please contact [email]

If any part of this study has effected you or raised caused you concern, here are details of various places you can call or visit online to get information or support

(same as Over 16)

Appendix 29: "Other" Reasons for Choice in No Russian Campaign

Skipping the campaign

- Straight to multiplayer baby
- only played multiplayer
- only play multiplayer
- Only play MP
- Online play is better
- Just played PvP
- it was very biased and unjust to the humanity and moral grounds
- it was very biased and unjust to humanity
- In the German version you can't shoot by yourself. You walk behind Markarov all the Time. Civilists can't be shot be you.
- I was more interested in playing the multiplayer
- I wanted to play online with my friends instead of playing the campaign.
- i wanted to play online
- i played just multiplier
- I only play Online content
- I only play multiplayer.
- I only play multiplayer in Call of Duty
- I just play multiplayer
- I have never played the campaign in ANY Call of Duty and probably never will, becauase I just can't sit through it.
- I found the entire concept of killing unarmed civilians to be in extremely poor taste, as well as immoral, regardless of what the character's motivations were.
- I don't play FPS story modes, just online multiplayer
- I do not know about it
- I didn't know about it
- I didn't know about it
- i did not care about it
- I bought the game for competitive multiplayer and not single player
- Didn't care for campaign, multiplayer only.
- did not play the campaign at all

Watching the campaign

- Would rather not kill innocent people for no apparent reason, may only be a game, but ^^
- They weren't shooting at me
- There are clear glidelines when you are NOC in an op like this.
- Tempo
- Role Playing the part of a good soldier
- Morally wrong.
- Just putting this out there. While it made me personally feel uncomfortable about doing it, it was a huge part of the games story. I would play it again if I were to replay the game. Also I believe there is a part at the end where you shoot at riot sqauds
- It was morally wrong

- Hoped it would change the story.
- Generally avoid killing civilians in games when possible
- Didn't want to 'fail' or restart mission.
- Did not know of effects on story line.
- By law the german version of the game had to be reprogrammed to not allow the player to shoot the civilians

Shooting in the Campaign

- Why not. It's a game with guns.
- why not
- warning shots in the air 'movie heist style'
- tried to kill the terrorists
- To wreck shit bruh!
- To survive against hostile NPC's which appear at a later stage in 'No Russian'
- To see if I could kill 'em all
- To see all outcomes.
- To play as a 'villain' type character which is normally not an option in FPS games.
- To not get found out and killed.
- to kill terrorists disguised as civilians
- to keep my cover, but i tried to miss when possible
- To defend myself, only a few civilians died/were hit due to my inexperience with certain weapons while attempting to not die.
- to defend myself
- there were police as well
- There are sides to both stories. We don't want to believe that the Nazi's were people, that the taliban are people. But they are, they have stories too. I did not play the mission to kill civilians for some sick joy, but I played it to get the full experi
- There are a few scattered enemies with weapons that can kill the player on higher difficulties.
- The life of a computer program is inconsequential
- the level was designed with this in mind. plenty of distructable environment elements.
- The game instructs you to follow their lead
- That's what would really happen in a deep undercover operation.
- simply because I could
- Shot in the air till security forces showed up.
- Shooting things in video games is fun!
- Self defence against cops
- Rhythm
- Only Fired away from civilians
- Note all shots were aimed away from people
- No other game offered the ability to kill civilians openly and without remorse. It was disturbing, but fun for a one time occurrence.
- mainly because I was being fired upon
- Lulz

Appendix 29: "Other" Reasons for Choice in *No Russian* Campaign

- Kill Russians !!
- Just walking was boring
- Just part of the game
- Its just a game, fun times to be had.
- Its a video game, not real life.
- Its a game.
- It's utterly fascinating to be able to do something evil in a video game, where traditionally you play as the hero, as the good guy. It allows me to explore the darker side of human existence, to experiment and see how it makes me feel.
- It's roleplaying. You're undercover, I won't blow my cover for that. It's other agency duty to prevent that. I trust them.
- It's only a game
- It's just a game
- It's a video game.
- It's a video game and I wasn't paying to much attention to the story.
- It's a video game and I was just playing along.
- It's a game...
- It's a game. It's fun.
- It was my first experience where you could actually shoot civilians. Not that, that interests me but it was like breaking a taboo, just had to try it.
- it was fun
- It is the only way I can get an erection
- It is boring if you don't
- It a game and they are just pixels on a screen.
- If I have infinite ammo, I'm gonna damn well use it.
- i was high
- I was deliberately missing people
- I was able to distinguish between playing a game and any 'real world' implications.
- I wanted to backstab the people I was with because they are excrement holes!
- I tried taking out the terrorists first.
- I thought I'd be caught as a mole if I didn't convince Makarov that I was loyal to him; so I kinds just sprayed in the general direction of the civilians.
- I thought I would fail the mission otherwise
- I mean it was in the game so why not take it? they should've removed it if it was bad
- I just shot the glass out the airport and shot in the air not to blow my cover. I don't shoot unarmed civilian avatars.
- I figured the character I was playing was in deep cover with a group of hardened terrorists who would easily suspect something if I had not taken shots. Considering the plot was leading to global war I figured I'd do my damndest role-playing this charact
- i enjoy killing
- I distinctly recall playing through it more than once and have completed it having both killed and not killed civilians in-game. I cannot recall exactly why, but it was most likely out of interest in how it would affect the story.
- I didn't know what exactly was going on since I didn't fully understand English at the time.
- I did fire my weapon, to keep in with the storyline and other terrorist

characters, however i did not shoot any civilians.

- Having fun playing a video GAME.
- Given it was apart of the story, I didnt know you could not kill them and still pass level.
- GG well-playes no re
- GG EZ NO RE WP BRIAN D
- Fun
- Fun
- For immersion's sake
- For fun.
- For fun, it's just a game.
- First play through I did not fire, felt uncomfortable, but on later play throughs I did fire, figured is just a game.
- Firing at walls/glass to maintain the character's undercover status.
- Firing at walls/glass to maintain the character's undercover status.
- Firing at the walls because I didn't like the idea of hurting civilians in-game
- Fired but purposely missed civilians for role play reasons
- Fired at the walls scaring people away
- Fired at environment, not the people
- Fat fingered my mouse button
- Do something outrageous that you can't do in real life because it's just a game.
- Didn't really think about it much
- Didn't realise what was going on at first.
- Did not shoot NPCs Fired at walls
- Cause I could.
- Boredom. Wasn't shooting at people.
- boredom
- Because there were enemy characters at the end of the level.
- Because it's a game that lets you do things that you are not supposed to do in real life. Virtual people are not real people.
- Because it's a computer game.
- Because it is a game
- Because it is a game
- Because I could
- Banter
- Attempted to kill Makarov
- and to kill russians at first
- All of above
- affordances of the game say shoot everything
- accident

Appendix 30: Extracts from Policies

Policy P6b: Patients Personal Possessions

7.4.1. In addition to any general ward storage of patients' possessions, each ward will have the following provision for patients' personal possessions that are not permitted to be retained in patients' rooms:

*. […]
* […]
*. […]
* Secure storage for Videos (**5**) **OR** DVD's/Blu-Ray Discs/Games Discs/Vinyl Records (**5**) (this can be a combination of the different types of discs named above, but not a combination of both discs and video cassettes) plus up to a maximum, if storage space permits, 24 audiocassettes.
(**NB** the numbers are per patient and are in addition to the number permitted in a patient's room).
* […]
* […]

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7.5.3. In addition to the boxes detailed in paragraph 7.5.2 above, the Patients Property Central Stores will also allocate one storage box per patient for Audio Visual media (i.e. CDs, audio cassettes, DVDs, BDs, Games Discs, video tapes and Vinyl Records) and will provide a weekly delivery/exchange service.

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10.7. Ward staff must ensure that all mains electrical items (i.e. televisions, video recorders, DVD players, games consoles, audio equipment) arriving at the hospital, which have not been purchased brand new direct from the Patients Shop, are checked for security and electrical safety. Ward staff must ensure that the equipment is sent to the Radio Shop for checking before it is retained by the patient.

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10.8 All videocassettes, DVDs and games discs entering the hospital must be sent to the Postal Monitors for screening and tagging. These items will then be sent to the Central Stores from where they can be requisitioned by the patient. (see appendix C)

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17. VIDEOCASSETTE TAPES/DVD'S/BLU-RAY DISCS/GAMES DISCS/VINYL RECORDS

17.1 Clinical Teams are to consider whether there should be any restrictions on the content of DVDs, Blu-Ray Discs (BDs) or Video Cassettes. The Clinical Team should consult the procedure for Patients Access to Sexually Explicit & Sexually Violent Material in doing so and must inform the relevant Security Liaison Nurse of these restrictions. <u>All</u> videocassette tapes, Games Discs, DVD's, or Blu-Ray Discs(BDs) entering the hospital, including those accompanying a patient on admission to the hospital, must be submitted to the Postal Monitors for screening and security labelling with the patient's name before a patient is permitted to have access to them. **No patient will be permitted to have access to a videocassette tape, DVD, or BD that carries an 18R classification, nor any media with 'PIN protected' content.**

17.2 Patients may only obtain videocassette tapes (whether blank or pre-recorded) and pre-recorded DVD's/BDs/Games Discs/Vinyl Records that are the original manufacturer's material. No privately recorded material will be permitted apart from exceptional circumstances and with the approval of the Clinical Team (see paragraph 17.3).

17.3 In exceptional circumstances, a Clinical Team may give written approval for a patient to receive a videocassette tape/DVD-R, etc (*re-writable media, eg- DVD-rw is not to be allowed*) which is not brand new. This might be a recording of a special occasion (e.g., family wedding) from a relative or friend.

17.4 If the recording is to be left as a gift at Reception, a copy of the approval must be forwarded to the Reception Manager prior to the recording being deposited.

17.5 On receipt of the recording the nurse in charge of the patient's ward must arrange for the recording, with a copy of the approval, to be sent to the Postal Monitors for processing.

17.6 Patients may receive videocassette tapes or DVD's / BDs on loan as part of a formal educational programme (i.e., from the Open University). The Patients Education Centre must forward these tapes or DVD's to the Postal Monitors for screening and tagging before being given to the patient.

17.7 Short-term loans of videotapes or DVDs/BDs/Games Discs/Records between patients must be approved by the Clinical Nurse Manager or Primary Nurse / Nurse in Charge and recorded in the ward diary and the Patients' MDT notes. **Any videocassette tapes or DVD's/BDs/Games Discs/Records that are permanently exchanged/given to another patient must be approved by the Clinical Nurse Manager then submitted to the Postal Monitors for re-tagging before the transfer takes place.**

17.8 Although a permanent exchange of the above items may take place between patients on different wards, **there must be no short term loans between patients on different wards.**

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Policy S20: Patients Access to Sexually Explicit & Sexually Violent Material

2.2. These guidelines cover patients' access to all sexually explicit material in visual form (ie magazines, catalogues, videotapes, DVDs etc), but not computer games (access to which is covered by Policy P6b 'Patients Personal Possessions'). The definition of 'sexually explicit' includes depictions of nudity or partial nudity (adult or child) and, as such, cannot be deemed to cover all material that might be sexually arousing to, or possibly used for sexual purposes, such as depictions of non-sexual violence or images of children on TV programmes, access to which will be determined by the clinical team on an individually assessed basis (see para 5).

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Reasonable Access

7.1 Within the framework of these guidelines, three key principles are set out:

7.1.1 Access is limited to material that is within the law

7.1.2 Access should be equitable regarding race, gender and sexual orientation

7.1.3 Access arrangements should ensure that the material in question can be managed by XXX Hospital, regarding ordering, vetting, storage and monitoring.

7.2 To these ends, the guidelines specify that the following separate procedures are adopted in relation to (a) sexually explicit magazines and (b) sexually explicit DVDs and/or Videotapes:

[…]

DVDs & Videotapes:

7.7 A patient's possession of a DVD or videotape is governed as follows:

7.7.1 A patient may have any DVD and/or videotape up to and including classification '15', on the basis that these do not include sexually inappropriate material, providing this is also in compliance with the Patients Possessions Policy. A patient may order any such DVD/Video from a list of the most popular titles within the public domain (based primarily on the BBFC used by film censors)

7.7.2 A patient may request to have a DVD and/or videotape at classification '18' providing its 18 classification is not based upon its sexually violent and/or violent content. Clinical teams can ascertain this through the British Board of Film Censors (BBFC) website and further advice can be obtained as necessary through the Standing Committee on Sexually Explicit Materials.

7.7.3 A patient may request through the clinical team that any '18' classification DVDs and/or videotapes currently in his/her possession be authorized to be retained if it complies with the criteria in 3.7.2. The clinical team can consult the Standing Committee on Sexually Explicit Materials for advice if required. If possession is declined on the basis that the DVD and/or videotape does not comply with the current guidelines, then the DVD and/or videotape in question will be removed. Any DVD and/or video tape that is removed will be kept by the XXX Hospital and returned to the patient when he or she leaves the hospital or when the Standing Committee on Sexually Explicit Materials may determine that it can be returned to the patient

7.7.4 A patient may not possess any DVD and/or videotape that is either unclassified or classified 'R18'

7.7.5 As with magazines, there may be material on DVD and/or videotape that is not sexually explicit but would nevertheless be clinically inappropriate for a particular patient to possess (for example, for some patients, certain images of children, or certain forms of violence depicted in DVDs and /or videotapes with a lower than '18' classification). A patient's access to this material would be a matter for the clinical team to consider and decide upon on an individual basis, as set out in para 5, in consultation with the Standing Committee on Sexually Explicit Material as necessary. If the material is deemed inappropriate, patient access will be denied.

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Inconsistencies within the policies

Management of VGs:

> "The Clinical Team should consult the procedure for Patients Access to Sexually Explicit & Sexually Violent Material in doing so and must inform the relevant Security Liaison Nurse of these restrictions." (P6b)

> "These guidelines cover patients' access to all sexually explicit material in visual form (ie magazines, catalogues, videotapes, DVDs etc), but not computer games (access to which is covered by Policy P6b 'Patients Personal Possessions')." (S20)

Changes to the scope of the S20

The policy has been updated and the original scope has been altered, however the policy itself makes reference to the scope and consequently now refers the reader to sections which are no longer present. The scope in its entirety is presented below:

> **3. SCOPE**
> The brief overarching policy applies across the Trust but the CSU specific guidelines that follow have only been developed for the for high secure services because of the particular risks and levels of monitoring that apply in that setting .
> Pg 6

Appendix 31: Audit Application

PROPOSAL FORM
CLINICAL AUDIT& QUALITY INITIATIVES

Your proposal will be reviewed by the Peer Review Panel to ensure that it is legitimate, feasible and will inform practice. Please complete all sections fully; expanding the sections and attaching related documents. The guidance notes may help you. Your proposal must be approved before you proceed.

1. Title of Project	
AN EVALUATION OF THE CURRENT MONITORING AND RESTRICTIONS OF VIOLENT VIDEO GAMES WITHIN A HIGH SECURE HOSPITAL	
2. Project Lead	
Name:	Rhia Phillips *Under the supervision of:* • *Prof. K Browne and Dr S Chou (University of Nottingham)* • *Michelle Christmas (West London Mental Health NHS Trust)*
Job Title:	Trainee Forensic Psychologist
Service:	Psychology
Contact details: **Telephone:** **Mobile:** **Email:**	 xxx xxx
Please highlight the CSU you plan to undertake your project in	*Forensic CSU / Local Services CSU or Trust-wide / External Organisation*
Please highlight the Service Line(s) you plan to include in your project	*High Secure / XXX Forensic / Liaison and long term conditions / Access and Urgent Care / Primary and Planned Mental Health Care / Cognitive Impairment and Dementia / Developmental Services*
3. Summary of Project: A couple of sentences outlining your proposed project	
PLEASE NOTE: This audit was originally approved in July 2015, please see Appendix 1 for the confirmation letter Security staff will be interviewed using a semi-structured interview schedule to gather information about the procedure for monitoring access to VVGs within the hospital (please see Appendix 2: General themes/ideas for questions for semi-structured interview). The results of this will be used to develop a questionnaire for distribution across the wards to explore how access to VVGs is monitored on the wards.	
4. What type of study are you planning? Please delete if not applicable.	
Audit of Clinical Practice [Service Evaluation]	
5. What are the project aims and objectives?	

Aim: To understand how access to VVGs is monitored with a high secure hospital. Objectives: To identify current procedures around the monitoring of access to VVG; make recommendations on current working practice, based on the current evidence on the effects of VVGs; and to publish the results to highlight the relationship between the research literature and current clinical practice.	
6. Service User Involvement	
a. Will service users be actively involved in this audit? Please circle	Yes No
b. If no, please explain why not:	This is an evaluation of current working practices rather than exploring patient opinion on the monitoring of VVGs
c. If yes, who will the service users be?	
ii. How will they be identified?	
iii. Do you think that Ethics approval will be required? Please circle	Yes No
7. How was the project identified?	
The effects of VVGs (and media in general) is a popular topic in psychology and research suggests that VVGs can make people more aggressive (Anderson et al, 2010) with some suggesting that the effects may be stronger than violent films (Lin, 2013). The hospital currently does not have a clear policy on access to VVGs, and refers instead to screening via postal monitoring, before being reviewed by clinical teams and security liaison nurses (Policy P6: XXX Hospital – Patients Personal Possessions). Therefore, this project aims to explore how VVGs are screened, as well as see how individual wards monitor what patients can access	
8. Was this audit identified as part of a serious untoward incident/clinical risk ? Yes No	
a. Please provide reference number/identifier:	
9. Which standard(s) are you going to measure your practice against?	
There is currently no policy related to the management of VVGs in the hospital. The aim of this clinical audit is to explore the various practices that are used. This will be compared to the current evidence on the effects on VVGs. At present there are no policies regarding access to VVGs, other than specified under Policy: S20 Patients access to sexually explicit and sexually violent material.	
10.Methodology: how are you going to do your project? e.g. collect, store and analyse your data	
The project will be split in to two sections: **Section 1**: interviewing relevant staff about how access to VVGs is monitored. This will require the use of semi structured interviews (please see Appendix 2: General themes/ideas for questions for semi-structured interview) to gain an understanding of how access to VVGs is currently managed within the hospital. Interviews will be conducted with members of the security team, including postal monitoring and security link nurses.	

Section 2: interviewing nursing staff about current practice
From these interviews, a questionnaire / structured interview will be developed to see how these guidelines are implemented on the wards. A member of nursing staff from each ward will then be interviewed to see how access to VVGs is monitored across the hospital

Interviews will be recorded in written form and will be typed up be the project lead. This will then be reviewed to develop a questionnaire for the wards. The questionnaire results will then be stored in a database. Original paper copies will be securely stored in a locked filing cabinet and will be shredded once the study is completed. Electronic copies of the data (with identifiable information) will be held in line with Trust policy. Identifiable information will be removed for the write up of the audit.

11. How are you going to protect confidentiality while you collect, analyse and report your data?

Only job titles and ward type (e.g. mental illness or personality disorder; admission, high dependency, medium dependency, or assertive rehab) will be recorded, rather than names of either participant or ward to protect confidentiality.

12. Project Schedule: when do you anticipate completing these key stages?

a	Data collection	**July-October 2015**
b	Data analysis	**November 2015**
c	Report completed & disseminated	**July 2016**
d	Recommendations agreed	**July 2016**
e	Implementation plan agreed	**July 2016**
f	Start of repeat	**Not proposed**

Any comments on the timescales: this is the timescale that was used in the audit

13. How will the project lead to positive changes in practice? Who will act on the recommendations and how are they involved in your project?

The project will help to evidence how access to VVGs is currently managed within the hospital and clarify whether a clearer, separate policy is required.

14. Please list the clinical areas you are planning to include e.g. services, community centres, wards.

Security service in XXX Hospital and the high dependency, medium dependency and assertive rehabilitation wards across the hospital.

15. Are you planning to collaborate with other organisations or publish this externally? If so, please detail.

The project will be in collaboration with the University of Nottingham, where the project lead is currently studying. This project will form part of a submission for a Doctorate in Forensic Psychology (case study element), with the aim to publish once completed.

A draft submission will be prepared for the University by the 31st of July 2016, after which amendments may be made depending on feedback, with a final submission date of the 30th of September. A copy of the draft submission will be shared with the audit group. The draft will not be shared outside of the University of Nottingham and will not include any identifiable

information.

On completion, please forward your proposal to the relevant chair of the clinical audit group or clinical audit lead for your Clinical Service Unit. If your audit includes other areas within the trust please ensure they also receive a copy, and agree to participation.

Once the chairs/clinical audit leads have signed the form or emailed their approval, please ask your Clinical Director or the Medical Director, depending on the scope of your audit, to sign your proposal below. In doing so, you are asking them:

- **To sponsor and agree that your project is practical and relevant**
- **To review your findings, ensure that good practice is shared and weak practice is addressed and improvements monitored.**

Signature: _____

Name: _____
Date: _____
Clinical Director / Medical Director

Signature: _____

Name: _____
Date: _____
Chair of Clinical Audit Group/Clinical Audit Lead

NEXT: E-mail your proposal and materials to the Clinical Effectiveness & Audit Team at XXXX **and** also post your signed copy to:

Clinical Audit
XXXX

Once you have completed your audit please ensure you feedback into your CSU clinical Audit Group

Appendix 1: General themes/ideas for questions for semi-structured interview

The aim of the interview is to be able to explore in detail the methods for managing violent video games in the hospital. As such, the interview is intended to be semi-structured to allow for exploration of answers. Below is a list of questions which will be included, however it is not intended to be used as a stricture interview schedule.

Can you tell me about the procedure for managing video games within XXX Hospital *(what is the process from a game entering the hospital to the game being played on the ward – is there a policy for it?)*

How was this decided? *(and what was done before this)*

Who is involved in the decision making process when allowing video games into the hospital / on the ward? *(job titles, reason for being involved)*

Are decisions about games made for the entire hospital, individual wards, or individual patients? If so, how is access restricted to those that have not been approved? *(examples)*

Which classification system is used? [BBFC/PEGI] What is your knowledge about each system? *(is it deemed relevant? Easy to use – aid decision making?)*

Have any video games not been allowed into the hospital? If so, why was this?

What is your understanding of the research on the effects of violent video games? Does this inform your practice? If so, how?

Appendix 32: Audit Approval Confirmation

NB: Information removed to observe confidentiality

Ms Rhia Phillips
Psychology Trainee
XXX Hospital

XXX

Tel: XXX
Fax: XXX

14 July 2015

Dear Rhia

You recently submitted an audit to the XXX Clinical Audit Group entitled "Current Monitoring and Restrictions of Violent Video Games".

We are pleased to inform you that your audit has now been reviewed and approved by the Group.

Yours sincerely

Appendix 33: Semi-Structured Interview Schedule

The aim of the interview is to be able to explore in detail the methods for managing violent video games in the hospital. As such, the interview is intended to be semi-structured to allow for exploration of answers. Below is a list of questions which will be included, however it is not intended to be used as a stricture interview schedule.

Can you tell me about the procedure for managing video games within XXX Hospital *(what is the process from a game entering the hospital to the game being played on the ward – is there a policy for it?)*

How was this decided? *(and what was done before this)*

Who is involved in the decision making process when allowing video games into the hospital / on the ward? *(job titles, reason for being involved)*

Are decisions about games made for the entire hospital, individual wards, or individual patients? If so, how is access restricted to those that have not been approved? *(examples)*

Which classification system is used? [BBFC/PEGI] What is your knowledge about each system? *(is it deemed relevant? Easy to use – aid decision making?)*

Have any video games not been allowed into the hospital? If so, why was this?

What is your understanding of the research on the effects of violent video games? Does this inform your practice? If so, how?

Appendix 34: Ward Questionnaire

Demographic Details
Ward:

Job role:

Months/years worked in the hospital:
Months/years worked on this ward:

Do you play videogames? ☐ Yes (hours a week: _____)
☐ No

Are there any patients on the ward who you have concerns about their access to video games? How many, what are the concerns, and how is this managed?

If no - are all patients allowed to access any of the ward games or only certain ones?

What kind (if any) restrictions are placed on access to video games on this ward?

How is access to violent or 18-rated video games monitored on this ward?

Do you feel confident in being able to decide whether a patient can access violent or 18-game video games?

What aids your decision making about whether or not patients can access certain video games?

Appendix 35: Participant Information Sheet

Participant Information Sheet

Title of Audit: An audit into the current monitoring and restrictions of violent video games within a high secure hospital

Name of Researcher: Rhia Phillips, Trainee Forensic Psychologist
xxx

Under the supervision of: Prof. Kevin Browne
(University of Nottingham)
[email]

Michelle Christmas (XXX Hospital)
[email

What is the purpose of the audit?
The aim of the audit is to understand how access to VVGs is monitored within a high secure hospital, by identifying the current procedures used by the security department and the nursing staff.

Why have I been invited?
Security Staff: you have been invited to take part to gain a better understanding of the current procedures used for monitoring access to VGs coming into the hospital and being accessed on the wards.

Nursing Staff: you have been invited to take part to see what procedures are currently used on the wards for individual patients.

Do I have to take part?
Participation is voluntary, you do not have to take part if you do not want to.

What will happen to me if I take part?
Security Staff: you will be interviewed by the lead researcher, which should take no more than hour and will be booked at a time when is convenient for you. The interview can be split-up into sections to fit working schedules

Nursing Staff: you will be asked to complete a short questionnaire at a time which is convenient for you. The lead research will be present, and will guide you through the questionnaire.

What are the possible disadvantages and risks of taking part?
You will be required to give up some of your time to take part, however the researcher will ensure that the interview / questionnaire is kept as brief as possible to minimise disruption. It will also be carried out at time which is convenient for you.

What are the possible benefits of taking part?
By taking part in this audit, you will contribute to an audit that will help to identify the current practices used in the absence of a clear policy. The results of this research will also contribute to the wider research base on VVGs, offering an insight into the practicalities of how they are managed with a high secure environment.

What happens when the audit stops?
Once the audit has finished, the results will be analysed and the audit will be written up for both the Clinical Audit Group within the hospital and as a submission forming a wider research project on the effects of VVGs as part of the lead researchers Doctorate in Forensic Psychology. The results of the audit will also be written up for publication to highlight the relationship between the research literature on the effects of VVGs and current clinical practice.

What if there is a problem?
If you have any concerns about the audit, you contact the lead researcher on the contact details or above, or speak with one of the supervisors also listed above

Will my taking part in the audit be kept confidential?
All information (interview and questionnaire) will be kept confidential and all identifiable information will be removed. Only job titles and ward type (e.g. mental illness or personality disorder, admission, high dependency, medium dependency, or assertive rehab) will be recorded. Hard copies of the data (notes from interviews, questionnaires) will be typed on a Trust computer, and the originals will be shredded.

What will happen if I don't want to carry on with the audit?
You have the right to withdraw from this audit at any time, up until your individual data is submitted for use in the audit.

Security Staff: If you are interviewed, a summary of what was discussed will be typed and sent to you for confirmation of accuracy. Once you have confirmed that they are accurate and consent to the information being used, you will no longer be able to withdraw from the study as the data will be anonymous and it will be impossible to identify individual responses.

Nursing Staff: Once you have completed the questionnaire and checked the results for accuracy, you will not be able to withdraw from the study as the data will be anonymous and it will be impossible to identify individual responses.

What will happen to the audit?
The audit will be written up and submitted to the Clinical Audit Group within the hospital. It will also be submitted as part of the lead researcher's thesis for their Doctorate in Forensic Psychology.

Appendix 36: Interview Transcript – Security Staff 1

Summary of Interview Information
Date: 31.07.15
Source: *Security Staff 1*

Can you tell me about the procedure for managing video games within XXX
There has recently been an update to the policy, whereby patients are allowed to own their own game discs for consoles on the ward, however they must be below an 18 rating (taking into account the differences between BBFC and PEGI ratings) as they will be played in a communal area and must be suitable for all. Wards however can own games that are 18 ratings, as a clinical decision can be made about all patients and their access to it, which can be better managed as patients move around the hospital.

As with other disks, patients are allowed up to 10 in in their possession (as a mixture of DVD/Blu-Ray, CD, game disks) which are stored in the ward office.

Patients can order VGs through a requisition to the patient shop, place an order with a catalogue (such as Argos), order directly through patient cash to the company selling the game, or via a relative. In all instances, the game must be new and sealed, as well as being an original copy of the game. To check that all games are legitimate copies, they are sent to postal monitoring for checking (load up the game, check the content) – they will then tag it and it can be ordered by the patient from patient stores. If the game is not what it is meant to be (pirate copy, over 18 etc), it will be refused. If it is an 18 game, then it will be returned to the source for a refund.

The process for ordering ward games can be more difficult, particularly if patients are using it as a way to bypass the 18 certificate rule. The request from ward staff should go to supplies, who will then check with the security department that it is appropriate. The game will come out of the ward budget and signed off by ward manager. While this means that technically any game could be ordered, it is fortunate that supplies is located with postal monitoring and they are able to work together or refer to the security department for more support.

How was this decided?
When VG consoles started having internet capability, it was decided in the Safety and Security Directions (Department of Health) that they would not be allowed in patient possession and would instead be owned by the hospital and kept in the communal areas for patients to use. Older consoles that did not have internet capability were permitted to remain in patient possession. Previously, patients who wanted to play VGs on the ward consoles would need to donate their VGs to the ward to use them. This meant that the games were no longer in the patient's possession and became property of the hospital instead. While this meant that that the VGs being played could be monitored by the clinical team, it raised issues around asking vulnerable adults to donate their property to the hospital – particularly if they (or others) wanted to play a new game and would therefore purchase a game to donate it to the ward to play it. It also caused problems when patients left the ward and wanted their property back. This issue was addressed towards the end of last year having been

raised numerous times at the patient forum and the security department agreed to formalise the management. This lead to a form being created to formally donate the game to the ward to provide written evidence of the decision being made. It was then agreed that patients could own their own games as of the 4th of February 2015 on the condition that they are under an 18 rating. This decision did not apply retrospectively, and is used for all new games on the ward. The policy relating to VGs is planned to be update in the near future.

The decision to allow games under an 18 is based on the principles of the S20 policy (*Patients access to sexually explicit and sexually violent material)* which states that patients are only allowed access to DVD/videotapes rated as 15, unless it reaches an 18 certificate for reasons other than sexually violent or violent content. In this instance, requests will be reviewed by the clinical team before patients will be allowed access to the material. As VGs use different classification systems, it was decided that access would be restricted to 18s, therefore PEGI ratings of 16 are still allowed. Unlike the S20, patients are not allowed access to 18 certificate VGs.

Who is involved in the decision making process when allowing video games into the hospital / on the ward
People involved:

- Individual making the request (patient or ward staff)
- Ward staff receiving the request (patient request) or ward manager (ward request)
- Patient shop/ stores/ postal monitoring
- Clinical team (including security liaison nurses)

All staff have the authority and responsibility to challenge the appropriateness of VGs requested – below 18 ratings can still be inappropriate and should be challenged. Requests for new VGs should be brought to the clinical team meeting and should be understood by all (content etc.). Decision is usually deferred to the Security Liaison Nurse as they work closely with the postal monitoring service.

Are decisions about games made for the entire hospital, individual wards, or individual patients? If so, how is access restricted to those that have not been approved?
Restrictions on 18 content was included when allowing patients to own their own games. Wards have always allowed 18 (once approved by the clinical team).
By restricting VGs to under 18 for individual use it reduces the risk of others accessing material which is inappropriate. The wards then have the decision as to which games they feel are appropriate for their patients to access from the ward collection, which can be altered depending on the patient mix. Otherwise, patients can move across the hospital wards with 18 content games which may be inappropriate for other patients to have access to.

Which classification system is used? What is your knowledge about each system?
Both the BBFC and PEGI rating systems are used. It is deemed appropriate to use the PEGI system as it is related to VGs specifically and therefore it is implied that it relates to the unique quality of VGs compared to films (i.e. being actively involved in the content). The current S20 policy

only refers to BBFC as it ignores VGs, however this is no longer appropriate and the policy needs to update to address this.

Have any video games not been allowed into the hospital? If so, why was this?
It has happened once or twice, but not sure about which games. There is not a definitive list of games, however there is one relating to films which postal monitoring keeps.

What is your understanding of the research on the effects of violent video games? Does this inform your practice? If so, how?
There have been other students who have highlighted the gaps in the policy and the need to draw links between the literature and current practice. The research is not as definitive as the link between sexually / sexually violent content and sexual violence (which is the basis for S20) and therefore more research is needed to help clarify the links between VG content and risk to patients to support the development of clear cut policy. However, it is appreciated that there are ethical concerns with exposing high secure patients to violent material to see their responses.

Ideally, it would be beneficial to see population comparisons (e.g. general population vs. high secure forensic, other vulnerable populations vs. psychiatric, adult vs child mental health, prison vs. mental health etc.). There have been some studies conducted in the hospital, however they relate more to the development of VG materials for use in others studies (prisoner dilemma task).

It is also important to clarify what is being looked at – immediate after effects, long term impact, typologies of players… there are ways to look at it without putting others at risks. VGs are currently played on the wards, so there could be room to conduct observations which involve no extra exposure. Patient backgrounds and preferences for types of games could also be explored. Often the research feels too far ahead for this population (looking at brain imaging, physiology etc) when the basics for this population are still unknown and needed. It is important to understand the influence/impact to know how to explore the effects in more detail for this population.

Appendix 37: Interview Transcript – Security Staff 2

Summary of Interview Information
Date: 07.08.15
Source: *Security Staff 2*

Can you tell me about the procedure for managing video games within XXX
The procedure has changed recently, games used to have to be donated to the ward to be accessed in the hospital (or returned to sender/kept in long term stores) (using a prohibited item form). Now patients are allowed to keep their own VGs as long as it is below an 18 rating – if it is an 18 rating that it would need to be sent back to its original destination (shop if purchased, or back to friend/relative who sent it in for them). Previously it would have been donated to the ward, but this is not allowed now. Wards are still able to order 18 rated games, but individual patients cannot in line with the S20(*Patients access to sexually explicit and sexually violent material*) policy.

There used to be a database for all media based content on the wards based on PEGI/BBFC content warnings, now it is only used for games which belong to the wards. VGs for individual patients are added to the patient property list for that person. Once it is listed on the appropriate database, is sent to patient stores and a copy of the paperwork sent to the patients. Patients can then request their items from patient stores.

If items are listed as prohibited (over 18, inappropriate content), the content is checked in line with the policy and flagged for the SLN to discuss with the patient/clinical team for a decision about what to do with the item. A memo is sent to the team, along with an email for the SLN and ward manager. It can take months for items to receive feedback.

If items are listed as restricted, the item is flagged, and permission is sought from the SLN before it is released to the patient. The SLN is required to get permission from the clinical team, and then send an email to confirm.

How was this decided?
The process of donating games to the ward did not work as there was no policy to enforce the decision and patients would request their games back when they moved wards / left the hospital. The wards already had access to 18 rated games and so it would not have been appropriate to remove them, given they had already been approved by the Security Liaison Nurses and the clinical teams.

Previously there were no restrictions on computer games / access to computers, however computers were removed after the Fallon Enquiry, which meant all consoles that had internet capability were removed from patient's possession and instead only hospital owned consoles on the ward were allowed to be used. The 2006 high security forum decided that the PS2 console was not allowed in patient possession and had to managed by the hospital instead.

It was felt that the release of *Grand Theft Auto IV* highlighted the need to take a more active interest in VG content as it came under the S20 guidelines (sexual violence). Prior to this it was not seen as a problem. As VGs are getting more detailed and in-depth, it is felt that clearer guidance

is needed, and more involvement from clinical teams to balance interpretation of the policy guidelines

There are issues with the current policies, particularly how vague they are in relation to VGs. The other high secure hospitals have a more clearly defined policy which aids decision making. The S20 is psychology led rather than security, and provides little guidance. The S20 itself used to be another policy which was more prescriptive, however it was felt to be out of date. The S20 policy provides some guidance on the process, however it is restrictive to moving images only and states that it is not related to the management of VGs. Previously VGs have been managed under P6 (*Patients Personal Property*).

Who is involved in the decision making process when allowing video games into the hospital / on the ward
Postal Monitoring will check the content of disks to ensure they are correct and will also check if they are within the policy (age, content etc.).

A decision is required from the SLN on the patient's ward, who is required to email confirmation of whether a game is allowed on the ward or for individual patients. The decision should be made as a clinical team, but ultimately it is the response from the SLN that effects what happens.

Are decisions about games made for the entire hospital, individual wards, or individual patients? If so, how is access restricted to those that have not been approved?
Decisions are made individually about games based on their destination (ward, individual). It is then the responsibility of the ward to manage access.

Which classification system is used? What is your knowledge about each system?
Both PEGI and BBFC, as long as a game is not an 18 it is allowed. PEGI system is relating to VGs specifically

Have any video games not been allowed into the hospital? If so, why was this?
Grand Theft Auto is "banned" in the sense that patients are advised not to attempt ordering it as it will be blocked. There are no blanket rules, but patients are informed that certain requests are unlikely to go through. There is a list of previous decisions as this helps to save time for patients rather than ordering items, waiting for approval, and deciding what to do with prohibited items.

What is your understanding of the research on the effects of violent video games? Does this inform your practice? If so, how?
Knowledge about the effects of VGs is related to clinical experience and common sense judgement.

It would be helpful to have a clearer defined policy developed by the psychology service which combines the evidence and guidelines for best practice which would also help to evidence and justify any "blanket" restrictions. Another high secure hospital was cited as a site that has a robust policy relating to VGs, which reduces issues of interpretation.

Appendix 38: Interview Transcript – Security Staff 3

Summary of Interview Information
Date: 01.09.15
Source: Security Staff 3

Can you tell me about the procedure for managing video games within XXX
Patients are allowed to own up to a 15 age-rated game, 18 rated games must be owned by the ward and need to be agreed by the clinical team.

Patients can order VGs either through the patient shop or through family/friends, the game will then go through postal monitoring before it is allowed into the hospital. Postal monitoring will then check that a. the game is real and b. that any content (e.g. violence) is suitable and will highlight any concerns to the clinical team (responsible clinician and security liaison nurse) before the game is released to the patient – the clinical team will then discuss the game and make a decision about its suitability.

How was this decided?
Following difficulties in the previous policy (whereby patients donated VGs to the ward to play them on owned hospital consoles), it was agreed that patients would be allowed to own their own games as long as they were not an 18. Previously there had been problems with wards following the policy about ownership, where some wards would return VGs to patients once they left the ward and others would not. There have also been instances of solicitors / legal teams getting involved due to patient's complaints about being "persuaded" to donate their property – citing problems with capacity or being a Vulnerable Adult.

Who is involved in the decision making process when allowing video games into the hospital / on the ward
Postal monitors review all content coming into the hospital

Clinical team makes the final decision about appropriateness of content for patients

Director of security may be involved to help decision making

Are decisions about games made for the entire hospital, individual wards, or individual patients? If so, how is access restricted to those that have not been approved?
Games are managed ward by ward. There is not a list of banned games, as that would risk falling into restrictive practice.

There is a discrepancy with this procedure and the policy with DVD's whereby the opposite is allowed (18 personal, 15 on the ward). The decision to allow 18 games is based on 18 games already being present on the ward (as they would have been previously donated) and it would be unfair to remove the games without clear justification as to why this had happened. However, this change is recent and therefore may change when the policy is updated.

As patients are not allowed to have their own VG consoles (or ones with internet capability at least), it is not possible to make individual decisions on the appropriateness of an 18 (as it has to be played in the communal

area and could therefore be seen by others), therefore the 18 decision is made based on the ward and the current patients on it. If patients had their own consoles, it would be easier to manage. While patients could swap discs, theoretically the current "one disk" policy would manage that. The plan for the new hospital will be to have diskless devices which could be monitored and appropriate restrictions added as necessary.

As wards can own 18 games, there have been instances where patients have placed pressure on the clinical nurse managers to order in games for the ward on their behalf. However, postal monitoring staff will still have to review the game before it is allowed on the ward – but it can lead to difficulties whereby the game may not be suitable for the ward and this may not have been discussed with the clinical team.

There are difficulties with how games are viewed within clinical teams, and decisions can be made based on personal bias regarding censorship – while the game may be legal, is it ethical for high secure patients to play? While the policy does not provide guidance on this, it also does not advocate for blanket restrictions or bans which may lead to problems with restrictive practice.

Patients are encouraged to discuss anything they wish to order in with the security liaison nurse prior to making the order, who can then advise about whether it is likely to be approved or not – or discuss it further with others (e.g. clinical team, security, postal monitoring). This prevents issues with property being held back/declined and difficulties in obtaining refunds.

Which classification system is used? What is your knowledge about each system?
Classification systems used on the covers / boxes are used to guide decision. Main focus is on the BBFC classification, as there is uncertainty about how the PEGI system links to the BBFC. Currently, decisions made about appropriateness of content are made based on the BBFC or IMDB synopsis.

Have any video games not been allowed into the hospital? If so, why was this?
GTA IV was stopped from coming into the hospital as a result of the DSPD directorate which felt that actions in the game mirrored individual's offences. This was in part due to the level of realism in the game content, as well as the media pressure on the topic which meant the effects of VVGs was more in the public mind.

What is your understanding of the research on the effects of violent video games? Does this inform your practice? If so, how?
Issues with understanding the possible effect – the media says yes, but it does not account for other issues such as mental health, background, etc. There is a lack of clear cut research to help guide decisions.

There are issues now with younger patients coming in who have been exposed to VVGs from a younger age than older patients in the hospital. It is important to understand how this may affect if and how access to VVGs are monitored within the hospital.

It is also important to focus on how videogames help patients by providing them with activities to occupy themselves and opportunities for escapism.

It would be interesting to explore how much patients play, and what additional activities they do or whether videogames restrict their involvement in other activities.

Appendix 39: Summary of Ward Staff Survey

	Concerns about patients?	What are the concerns?	How are these managed?	Open access games?	What restrictions are placed on video games?	How is access to violent or 18-rated monitored?	Do you feel confident in deciding if a patient can access?	What aids your decision making?	What general policies/ principles would you like the hospital to adopt?
Gamer 1	Yes - 2	Using to act out fantasies related to behaviour in need of treatment. 1 patient mental state decreases, plays more (same level over and over - stealth level, stab opponents)	Listed in notes, but if games here difficult to review content again. Relapse signature goes in notes, but no way to flag concerns about content	Any can play, could be care planned, but not currently. Stored in ward safe/ locked cupboard	None that aware of. Unsure of how content is played. 18 despite conflict with DVDs in day area. 1 in 1 out for risk, signed in and out	Nothing beyond sign in - not captured	Not my choice - not at my discretion. Ward policy dictates, cannot go over otherwise complaints. Curiosity. Team? Maybe. Would require change to operational policy	No real decision making - ward policy. No clinical say	No policy. Vetting system. 18 shouldn't be in the hospital, could in their room but should be on an individual basis. Centralising of judgement - postal monitoring and security should have more input for each ward rather than difference. "This is what you can and can't have." If security is involved probably not adequate
Gamer 2	No	N/A	N/A	Open access to all	No restrictions	Postal monitoring stops access to inappropriate games	Yes	Not allowed them, so can't order it	Stored in boxes, everyone can go through. Team leader or manager. Any question (staff or patients) not happened

	Concerns about patients?	What are the concerns?	How are these managed?	Open access games?	What restrictions are placed on video games?	How is access to violent or 18-rated monitored?	Do you feel confident in deciding if a patient can access?	What aids your decision making?	What general policies/ principles would you like the hospital to adopt?
Gamer 3	Yes - 2	Personal view: content - violence. Violent people playing violent game	No management, personal concern. If could - individualised agreement of what can and can't --> high gore content	Kept in safe, any can request	All in office, all risk item. Unsure about 18s	Not monitored. Games signed in and out as a matter of course	No confidence in saying no, don't want to upset	Broad knowledge of patients, should discuss on clinical team meeting	Aware of policy - no. Would help: clarity on age ratings for individual basis. Console out of the way, easy to congregate away from staff
Gamer 4	No	N/A	Not really played	Open, security cupboard	Not aware for the ward. Request activity coordinator --> clinical team meeting --> security liaison nurse	Through clinical team, if allowed	Yes - go through clinical team, security	Mental state, index offence, team	Shouldn't allow violent games - here to treat violence, shouldn't be allowing it. Killed in real life and allowed to do it here
Gamer 5	Yes - 1	Spends long time asleep, then most awake time is on consoles. Concerns over whether VG time contribution to dissociation periods. Concern around screen	Awaiting formal assessment. Xbox is currently broken. Previously noted, but nothing formally. Discussed by team	All games allowed - kept in cupboard (10), others in separate room	All games have to be 15 or under for ward/hospital	18 shouldn't be on ward - go through CTM and would be stopped	Yes, some games rated low, but the content is not appropriate. Confident to challenge issues related to appropriate to index offence	Knowing patient history (index offence) knowing the risk associated. Policies related to ward	Age restriction should be lowered to 12, restrict access to combat simulation games (based on own observations) shouldn't be encouraging patients to do it

	Concerns about patients?	What are the concerns?	How are these managed?	Open access games?	What restrictions are placed on video games?	How is access to violent or 18-rated monitored?	Do you feel confident in deciding if a patient can access?	What aids your decision making?	What general policies/ principles would you like the hospital to adopt?
		time rather than content							
Gamer 6	Not currently (caveat: console is currently password protected and unusable)	As long as not secluded, can play freely. If were, would be vigilant risk related to item rather than content	Searches, checks, etc.	Anyone can play. Games vetted by security before, clinical nurse manager before - may have linked with security	Not sure of criteria, something related to violence. Not worse available, not excessively violent	Don't differentiate on age rating, depends on interest. Sign in and sign out sheets - risk of items	Personally don't, can watch anything in their room. Not restricted anyone before - all over 18, expect staff to do it when allowed to (security)	Mental state, interest in games, influence of others (co-op play)	Not aware of policies. Postal monitoring involved. Down to individual wards, very violent games, need to manage certain ones given environment. Similar issues to TV/DVDs
Gamer 7	Yes - 1	Some games are violent and linked to index offence. Can get excited, see change in behaviour	Not allowed 18's - individually assessed. Not allowed to play on the ward, but has Wii console in room	Locked cupboard, but anyone can ask. If been ok to have 18 can have it	No 18 games on the ward - varies on the patient. Some 18 allowed if not violent	Monitored through the clinical team - has to go through security who check first. Individuals have to sign in and out	No, team decision. Psychology has a bigger input. If ask to sign out check with nurse in charge/others until clear answer	Nurse in charge, team. Reading notes - can indicate if allowed or not. Check if already have any - 1 in, 1 out.	Not sure of policies related to content. Know about numbers, 18s, etc. List of approved games / DVDs which was on the ward for staff and patients to check. Should be a section in the clinical team meeting each week to discuss view. Benefit of memory stick - can check content. Needs

	Concerns about patients?	What are the concerns?	How are these managed?	Open access games?	What restrictions are placed on video games?	How is access to violent or 18-rated monitored?	Do you feel confident in deciding if a patient can access?	What aids your decision making?	What general policies/ principles would you like the hospital to adopt?
									more clarity about what is and isn't allowed. Security should have more input about the decision to feedback to ward.
Gamer 8	No	N/A	N/A	Yes, security cupboard	Have to go through security liaison nurse, allowed 18s - if restricted wouldn't come in the ward	Security liaison nurse filters. Sign in sheet	If concerned discuss with clinical team, depends on concerns	Any request is given unless concern raised	Happy as it is. Happy to raise
Gamer 9	No	N/A	N/A	Yes	More security - disks. 1 in, 1 out. Not sure about 18's	Don't have any 18's on the ward - same as DVD's	Blanket rule for fairness - not all effect, but keeps it consistent	Blanket restriction. Lower than 18 allow. Don't need to rely on individual - most violent offence	Not aware. Rely on operational policy. Policy needs clarifying - generalise for all hospital? Or individual? Games vetted - security? Brief info to help decide

Appendix 39: Summary of Ward Staff Survey

	Concerns about patients?	**What are the concerns?**	**How are these managed?**	**Open access games?**	**What restrictions are placed on video games?**	**How is access to violent or 18-rated monitored?**	**Do you feel confident in deciding if a patient can access?**	**What aids your decision making?**	**What general policies/ principles would you like the hospital to adopt?**
Non-Gamer 1	No	N/A	N/A	Yes. 10 on the ward - others available, secure	Has to be cleared by the clinical team	Discussed in the clinical team meeting, told if particular can't be played. May be kept separate if only some can	Rely on the team. Raise concerns if needed. Speak to nurse in charge beforehand	Index offence, current presentation. Not aware of policies. Ward policy	Certainty around content. Really violent shouldn't be allowed. Some may play and be allowed, but others can watch
Non-gamer 2	Yes - 1 (left now)	Playing violent games - care plan	Care plan - monitor time, what playing. Certain not allowed. Restricted for all the ward	All can access - all suitable. Locked cupboard	1 in, 1 out. Some have games in rooms - access to consoles	Some not allowed to have - x rated not allowed, managed by security/postal monitoring checked with clinical team	Cleared by clinical team meeting so can have it. Even if have, judge on the day. Feel able to stop if concerned	Risk - links to index offence, mental state	Policy - available, clear about what can / cannot have. Help to manage what comes in. Policy should be clear to staff. Links to care plan should be able to manage it to restrict access --> link to policy makes it clear why. Care plan clinical involvement

Appendix 39: Summary of Ward Staff Survey

	Concerns about patients?	**What are the concerns?**	**How are these managed?**	**Open access games?**	**What restrictions are placed on video games?**	**How is access to violent or 18-rated monitored?**	**Do you feel confident in deciding if a patient can access?**	**What aids your decision making?**	**What general policies/ principles would you like the hospital to adopt?**
Non-gamer 3	Yes - 1 (left now)	Links to index offence	None now. The Sims - scantily clad females, questionable about appropriateness of sexual content	Open access. Discussed in clinical team meeting, have to be cleared first by security	All games free for all patients unless specific to individual (e.g. Sims) --> links to index offence	By staff - sign in and out. Can observe from nursing station	Rely on policy / clinical team	Mental state, ward policies relating to access	More involvement from clinical team. Policy - focus on sexual, what about violence? Impact on therapy. Appropriateness of content based on Index offence. Label/code VGs - index offence, can't play/watch
Non-gamer 4	No	N/A	N/A	Any patients can - few play	Depends on patient rather than ward	Signed in and out - 1 in, 1 out	Discuss with team	No aids, down to an individual basis	No, not played on the ward

Appendix 40: 18 Rated Games on the Wards

Title	Rating System	Content warning	PD			PD/MI		MI		
			A	HD	MD	AR	AR	A	HD	AR
Aliens Colonial Marines	PEGI	Bad language, violence				Y				
Army of Two	BBFC	N/A				Y				
Assassins Creed 2	PEGI	Bad language, violence		Y						
Assassins Creed 3	PEGI	Bad language, violence	Y		Y					
Assassins Creed Syndicate	PEGI	Discrimination, bad language, violence, gambling		Y						
Battlefield	PEGI	Bad language, violence								Y
Bioshock	BBFC	N/A				Y				
Bioshock 2	PEGI	Bad language, violence			Y					
Borderlands 2	BBFC	N/A				Y				
Call of Duty: Advanced Warfare	PEGI	Bad language, violence		Y			Y			Y
Call of Duty: Black Ops	BBFC	N/A								Y
Call of Duty: Black Ops 2	PEGI	Bad language, violence			Y	Y	Y			
Call of Duty: Modern Warfare 2	BBFC	N/A					Y			
Call of Duty: Modern Warfare 3	BBFC	N/A			Y				Y	
Deadspace 3	PEGI	Bad language, violence					Y			
Dishonoured	BBFC	N/A					Y			
Dragons Dogma	PEGI	Violence		Y						
The Evil Within	PEGI	Bad language, violence								Y
Fallout 3	BBFC	N/A				Y				
Fallout: New Vegas	BBFC	N/A		Y			Y			
Far Cry 3	PEGI	Bad language, violence, gambling			Y	Y		Y		Y
Gears of War	BBFC	N/A				Y				
Gears of War 3	BBFC	N/A					Y			
Gears of War Judgement	PEGI	Bad language, violence			Y					
Ground Zero	PEGI	Bad language, violence								Y

PD=Personality Disorder; MI=Mental Illness; A=Admission; HD=High Dependency; MD=Medium Dependency; AR=Assertive Rehabilitation

Appendix 40: 18 Rated Games on the Wards

Title	Rating System	Content warning	PD				PD/MI		MI	
			A	HD	MD	AR	AR	A	HD	AR
Hitman Absolution	PEGI	Bad language, violence		Y			Y			
LA Noire	BBFC	N/A		Y						Y
Left 4 Dead	BBFC	N/A				Y				
Left 4 Dead 2	BBFC	N/A				Y				
Max Payne 3	PEGI	Bad language, violence		Y			Y			
Metal Gear Solid 5	PEGI	Bad language, violence		Y						Y
Metro Last Light	Both	Bad language, violence							Y	
Resident Evil 5	BBFC	N/A				Y				
Resident Evil 6	PEGI	Bad language, violence		Y	Y					
Saints Row 4	PEGI	Bad language, violence		Y				Y		Y
Sleeping Dogs	PEGI	Drugs, bad language, violence					Y			
Spec Ops the Line	BBFC	N/A					Y			
Tom Clancy: Splinter Cell	PEGI	Bad language, violence		Y						
Wolfenstein New Order	PEGI	Bad language, violence					Y			

PD=Personality Disorder; MI=Mental Illness; A=Admission; HD=High Dependency; MD=Medium Dependency; AR=Assertive Rehabilitation

Appendix 41: PEGI Rating System

About PEGI
What do the labels mean?
The PEGI labels appear on front and back of the packaging indicating one of the following age levels: 3, 7, 12, 16 and 18. They provide a reliable indication of the suitability of the game content regarding protection of minors. The age rating does not take into account the difficulty level or skills required to play a game.



PEGI 3
The content of games given this rating is considered suitable for all age groups. Some violence in a comical context (typically Bugs Bunny or Tom & Jerry cartoon-like forms of violence) is acceptable. The child should not be able to associate the character on the screen with real life characters, they should be totally fantasy. The game should not contain any sounds or pictures that are likely to scare or frighten young children. No bad language should be heard.



PEGI 7
Any game that would normally be rated at 3 but contains some possibly frightening scenes or sounds may be considered suitable in this category.



PEGI 12
Videogames that show violence of a slightly more graphic nature towards fantasy character and/or non graphic violence towards human-looking characters or recognisable animals, as well as videogames that show nudity of a slightly more graphic nature would fall in this age category. Any bad language in this category must be mild and fall short of sexual expletives.



PEGI 16
This rating is applied once the depiction of violence (or sexual activity) reaches a stage that looks the same as would be expected in real life. More extreme bad language, the concept of the use of tobacco and drugs and the depiction of criminal activities can be content of games that are rated 16.



PEGI 18
The adult classification is applied when the level of violence reaches a stage where it becomes a depiction of gross violence and/or includes elements of specific types of violence. Gross violence is the most difficult to define since it can be very subjective in many cases, but in general terms it can be classed as the depictions of violence that would make the viewer feel a sense of revulsion.

Descriptors shown on the back of the packaging indicate the main reasons why a game has received a particular age rating. There are eight such descriptors: violence, bad language, fear, drugs, sexual, discrimination, gambling and online gameplay with other people.



Bad Language
Game contains bad language



Discrimination
Game contains depictions of, or material which may encourage, discrimination



Drugs
Game refers to or depicts the use of drugs



Fear
Game may be frightening or scary for young children



Gambling
Games that encourage or teach gambling



Sex
Game depicts nudity and/or sexual behaviour or sexual references



Violence
Game contains depictions of violence



Online gameplay
Game can be played online

Extended Consumer Advice

This is specific information explaining why a game received its classification. A number of examples are listed below:

Contains: extreme violence, criminal techniques, glamorisation of crime, strong language
Contains: comic violence
Contains: nudity, strong language, unrealistic violence