

Do Violent Video Games Increase the Chances of Young People Committing Crimes?

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Abstract

The influence of violent video games on criminal behaviour is an issue that is affected by a wide range of social, environmental and individual factors. With advancements in technology, immersive video game experiences that are becoming drastically more realistic. As a result, concerns have been raised that prolonged exposure to violent video games may be desensitising those who are playing them to real-world violence. This study aimed to provide a clear understanding of the potential influence of violent video games on criminal behaviour amongst young people. A comprehensive search strategy was developed with the use of specific keywords related to the research question. Analysis of these studies produced a variety of conclusions; some believed that consumption of violent video games could result in young people committing crimes, while evidence from analysis of the General Aggression Model suggests that this model is an effective tool when used as a predictor for both aggression and aggressive behaviour within young people. An excess of questionnaire-based studies means that the results are hard to generalise across large populations, an increase in longitudinal studies would therefore be beneficial in this area. Whilst the evidence is not conclusive that violent video games cause young people to commit crimes, it could be argued that violent video games cause increased aggression. This, combined with other external factors, could cause criminal behaviour amongst young people. The effects of other external factors, such as a young person's family situation and peer groups need to be investigated further.

Key terms: *Violent Video Games; Young People; Criminality; General Aggression Model*

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Introduction

1.1 Background and Rationale

With many news outlets reporting on the effects of violent video games, the impact they are having on young people has come into question. Violent video games are defined as video games that depict virtual violence, harm or aggression towards either a character or object within the environment of the game (Ward et al, 2016). This genre of games has previously been linked to higher aggression levels, and in some cases, committing crimes. These crimes can be any behaviour that is defined as “illegal or criminal”, and can include the likes of; assault, vandalism and murder (Block & Block, 2014). Violent video games can be played by a large variety of individuals due to their accessibility, and this includes young people. Young people are defined as “individuals in the adolescent and young adult range, typically between the ages of 10-25” (World Health Organisation, 2014). Video games are widespread across the world and have become a fundamental part of youth culture. Millions of young people engage in gaming activities across the world, each using various platforms to do so. The Office for National statistics (2020) reported that the average time spent by young people gaming at home in 2020 had risen by approximately 45 minutes per day, in comparison to the 240-minute average in 2014. However, as the popularity of video games has increased over recent years, so have concerns about the potential impact that violent video games have on both the attitudes and the behaviour of young people (Hasan et al, 2014). Within this, the notion that violent video games could increase the chances of young people committing crimes has become a subject that is heavily debated. Technology has made significant leaps forward within the last few years, with immersive video game experiences that are becoming drastically more realistic. As a result, concerns have been raised that prolonged exposure to violent video games may be desensitising those who are playing them to violence in the real world, thus blurring the boundaries between virtual violence and actual violence (Exelmans et al, 2015). Researchers

argue that this real-life aggressive behaviour can develop into criminal acts amongst vulnerable groups of individuals, with young people being one of these (Boxer & Docherty, 2015).

Whilst there has been a plethora of studies that have explored the relationship between violent video games and aggression, the specific link between violent video games and criminal behaviour is one that is often overlooked and remains a contentious issue to this day. Some studies have suggested that there is a positive correlation between violent video games and aggression, and that such games could potentially contribute towards an individual committing crime (Gentile et al, 2004). On the other hand, different studies have produced inconclusive or contradictory findings (Halbrook et al, 2019). This reiterates the need for further research into this topic.

Understanding the potential correlation between violent video games and young people committing crimes is imperative for a variety of reasons. Firstly, a significant association between exposure to violent video games and criminal behaviour would raise important ethical concerns for the responsibility of game policymakers and developers in regulating access for young people to aggressive and violent content. Secondly, identifying factors that contribute to young people committing criminal acts is essential when trying to implement effective prevention strategies. This would mean that appropriate measures could be put in place to reduce any unfavourable effects and could act as early intervention. (Elson & Ferguson, 2014).

Despite the valuable knowledge gained from previous research, there are still gaps in knowledge that need to be addressed. The influence of violent video games on criminal behaviour is a growing concern that is complex and influenced by a wide range of factors. These include social, environmental and individual factors. Young people are shaped by the environment around them, and as a result are more likely to model their behaviour based on their peers, surroundings and personal relationships (Granic et al, 2014). Whilst some argue

that violent video games desensitize younger players to violence (Prescott et al, 2018), others emphasize the importance of individual and contextual factors that contribute towards the relationship between violent video games and criminal behaviour. Such factors can include the likes of family situation and peer groups of a young person. Correlations between peer groups and a young person's family situation have been found to influence violent video game play (Verheijen et al, 2018).

This study aims to provide clarity on the complex dynamics present and provide a clear understanding of the potential influence of violent video games on criminal behaviour amongst young people. The research conducted will be focusing on specific research questions and objectives. These research aims and questions are focused on specific areas within the topic that will enable for a deeper understanding when examining the results of existing literature.

1.2 Aims and Objectives

1. To conduct a systematic review of research into the relationship between violent video games and crime committed by young people.
2. To examine the extent to which exposure to violent video games correlates with an increase in aggression and hostility amongst young people.
3. To explore potential ethical implications of the impact of violent video games on young people.

1.3 Research Questions

1. What does current research on the association between violent video games and criminal behaviour amongst young people indicate?
2. To what extent do violent video games contribute to increased aggression and delinquency amongst young people?

3. What effects do non-violent video games have on young people in comparison to violent video games?

Methodology

2.1 Search Strategy

A comprehensive search strategy was developed with the use of specific keywords that aim to discover if violent video games increase the likelihood of young people committing crimes. PICO framework was used to construct part of the search strategy, by filtering the use of keywords within articles to produce relevant and accurate sources. These keywords used include the likes of; delinquency, aggression, young people and youths (see appendix 2). PICO framework has been found to be an effective tool for a wide variety of researchers (Schardt et al, 2007). Searches were conducted within Discover, the search engine for the University of Bedfordshire. All searches within this engine were time-limited, between 2002-2022 and followed strict selection criteria. This time frame was used due to there not being enough relevant research specific to the research question within the last 5 years. A subsequent search on SCOPUS proved this to be the case. This review adhered to the PRISMA guidelines. Databases selected for this search included: Academic Search Complete, PsychINFO, PubMed and Scopus. Boolean operators such as AND and OR were used when filtering studies.

2.2 Study Selection

All articles initially retrieved from Discover were subjected to specific inclusion & exclusion criteria. This saw an initial search of over 42,000 studies get refined down based upon how relevant they were to the research question. The first round of screening was a quick and brief examination of titles and abstracts, whilst the second consisted of an advanced screening of full texts. This led to 207 reports being sorted for retrieval. Only peer-reviewed academic journals were chosen for selection, with some sources excluded due to low sample size ($n > 50$)

and a lack of longitudinal data. Of those that were sought for retrieval, 33 studies were critically examined for eligibility, with 10 being included within the review (fig 1). Studies conducted more recently would have been used, but the sample of those that were deemed as both recent and relevant to the research question was too small. A further search on Scopus proved this to be the case, which is why the range of 2002-2022 was maintained.

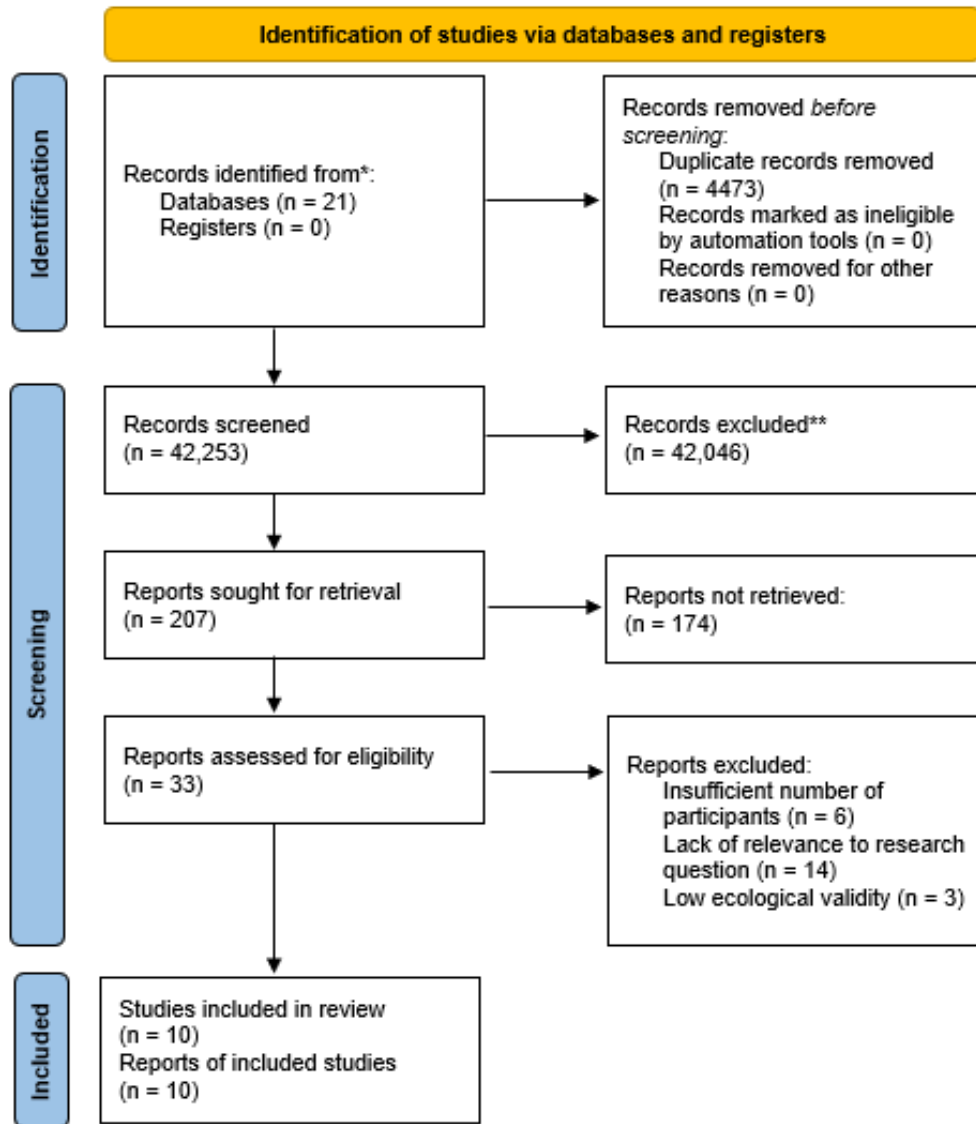


Figure 1: The screening process used for the selection of studies.

2.3 Inclusion Criteria

Each article needed to be a peer-reviewed, scholarly article to ensure the inclusion of reliable and credible sources. The articles selected had to have been between the year 2002 to present day. Focusing on more recent publications allows for consideration of the most up-to-date and relevant research within the topic. All articles were required to be published in English. This allowed for easy accessibility, as well as ease of comprehension. It was also important that each study used some form of quantitative data, as this would allow for easier comparing and contrasting with other studies within the literature review.

2.4 Exclusion Criteria

Studies that were excluded from the systematic review were all non-academic sources. The exclusion of non-scholarly articles helps to maintain the credibility and rigor of the research. Also excluded were studies that did not directly address the relationship between violent video games and criminal behaviour. Most of the research into this topic focused on the relationship between violent video games and aggression. Whilst helpful, this area of research was not fully relevant to the research question and therefore studies that solely addressed aggression and not criminal behaviour were withdrawn from the selection process.

2.5 Theories

Throughout this research the theories that will be discussed are The General Aggression Model and Social Learning Theory. These were chosen as they can both be used as effective tools when analysing the correlation between violence and young people. They were also present during multiple studies within the literature review, highlighting this correlation further.

2.5.1 The General Aggression Model

The General Aggression Model (GAM) (Allen et al, 2018) believes that exposure to violent media (of any kind) can lead to increased aggressive behaviour through a wide variety of psychological processes. The GAM states that playing violent video games can increase aggressive thoughts, aggressive feelings and a person's psychological arousal. This can result in increased levels of aggressive behaviour. The GAM suggests that individuals who are consistently exposed to violent video games may undergo long-term changes in their behaviour, potentially their aggressive tendencies. This could increase the probability of them engaging in aggressive or criminal behaviours (Anderson et al, 2011). The effectiveness of the GAM was re-evaluated in 2018 by Anderson & Bushman. During this assessment, six effects of violent screen media use were analysed with subsequent aggressive behaviour. It was found that the GAM was an effective tool for four out of these six effects. It was also noted that further research was needed on both peer group shifts and impulsivity deficits as catalysts for aggressive behaviour.

2.5.2 Social Learning Theory

Social Learning Theory (SLT) is the notion that individuals learn behaviour through observing, imitating and then subsequently reinforcing (Bandura, 1977). In accordance with this, exposure to violent video games could serve as a form of observational learning. Players of these games may imitate the aggressive and violent behaviours portrayed in front of them. In addition to this, SLT suggests that the reinforcement mechanisms within the games, such as being positively reinforced for aggressive actions, could potentially encourage aggressive behaviour in real life. SLT provides an insight into how exposure to violent video games may influence young people's behaviours and actions, potentially increasing the likelihood of them engaging in criminal acts (Bandura, 1977). Developing an understanding of the work of Bandura is vital

in the analysis of Social Learning regarding aggression. It is this initial behaviour that can result in potential criminal activity (Allan, 2017).

2.6 Outcomes

This review aimed to explore whether or not there was a positive correlation between violent video games and criminality amongst youths. All these articles include the effects of violent video games on young people. Whilst there are a variety of effects present, each article had the specific correlational study of violent video games and criminality amongst youths. This information enables this research to ascertain the potential positive and negative effects that violent video game usage can have on young people.

2.7 Data Synthesis

A meta-analytic approach was used when extracting data due to the size of the study. This allowed for the inclusion of quantitative data, which was necessary for a study of this magnitude as it made filtering through previous research much simpler. Furthermore, this allowed for easier comparing and contrasting of selected studies. This results in each study selected having a high validity in relation to the research question.

2.8 Ethical Considerations

When conducting research, numerous ethical considerations must be addressed to ensure the responsible use of previously published literature and data (see appendix 1). All studies selected will have adhered to strict BPS guidelines. This means that each study has obtained informed consent for each participant, with everyone having the right to withdraw. Furthermore, all studies selected will maintain the anonymity of the participants within the study. Research that has selected participants via the use of random sampling will be used to negate any potential researcher bias (British Psychological Society, 2018).

Results

3.1 Results Table

Using the literature found by utilising the methods mentioned in the previous chapter, this results section will refer to the data found within each study that has been selected for this literature review. A summary table of this can be found below in **Table 1**.

Table 1: A summary table of data found within the literature review.

Authors	Year of Publication	Name of Study	Name of Journal	Country of Origin	Hypothesis	Quantitative/Qualitative	Study Design	Participant's Age Range	Findings
Impink et al	2020	Violent Video Games And Crime	Journal of Media Economics	USA	Both Hypothesis and Null Hypothesis were stated	Quantitative	Time-Series Regression Analysis	N/A	The release of top-selling VVG's positively correlates with an increase of crime in the subsequent week
Smith et al	2018	A longitudinal analysis of shooter games and their relationship with conduct disorder and	Journal of Law and Psychiatry	UK	N/A	Quantitative	Longitudinal Study	5 Years Old-15.5 Years	Neither competitive video games nor violent video games predicted later likelihood of

		self-reported delinquency							conduct disorder
Ferguson	2011	Video Games and Youth Violence: A Prospective Analysis in Adolescents	Journal of Youth and Adolescence	Mexico	The frequency of exposure to VVG's at Time 1 will predict serious aggressive behaviour	Both	Standardised Scripted Interview	10 Years Old- 14 Years Old	VVG's not a predictive factor to youth crime, but depressive symptoms and antisocial behaviours were
Olson	2004	Media Violence Research and Youth Violence Data: Why Do They Conflict?	Academic Psychiatry	USA	N/A	Both	Systematic Review	N/A	Difficult to establish a link between VVG's and crime, notes that studies on this would be "impractical and expensive"
Ward	2011	Video Games and Adolescent Fighting	Journal of Law & Economics	USA	Unconditional correlations overestimate the link between VVG's and violence	Quantitative	Meta-Analysis	N/A	Significant positive correlation between VVG's and crime is limited to heavy users
Ferguson et al	2014	Violent Video Games, Catharsis Seeking, Bullying,	Crime & Delinquency	USA	Any relationship between video game playing and delinquency	Quantitative	Meta-Analysis	12-14 years old	little evidence for the assertion that VVG's are a useful predictor for

		and Delinquency: A Multivariate Analysis of Effects			will be moderated by other relevant third variables: potential risk and protective factors such as trait aggression, family environment, stress, participation in extracurricular activities, and perceived support from peers and family				youth delinquency
Ybarra et al	2022	Violent Media in Childhood and Seriously Violent Behavior in Adolescence and Young Adulthood	Journal of Adolescent Health	USA	N/A	Quantitative	Survey	10-15 years old	Exposure to violence in VVG's positively correlates with violent behaviour in adolescents
Ybarra et al	2014	Video games and crime	Contemporary Economic Policy	USA	Omitted variable bias will result in the reported magnitudes under- measuring the actual effects	Quantitative	Meta-Analysis	15-24	Actually suggests that video game play leads to a DECREASE in crime and mortality

Ferguson et al	2011	Personality and media influences on violence and depression in a cross-national sample of young adults: Data from Mexican-Americans, English and Croatians	Computers in Human Behaviour	Mexico, USA, UK and Croatian	N/A	Quantitative	Questionnaire	"young adults"	Violent acts are predicted by negative personality traits, not correlated with VVG's
Dill et al	2011	Recurrent Issues in Efforts to Prevent Homicidal Youth Violence in Schools: Expert Opinions	New Directions for Youth Development	USA	N/A	Quantitative	Meta-Analysis	N/A	VVG's do not directly cause school shootings, but could be classed as noteworthy in the progressive build up to this

3.2 Impink et al (2020): Violent Video Games and Crime

In 2020, Impink et al examined the change in crime observed in the weeks following the release of top-selling video games between the years 2006-2011. Conducted in the USA, quantitative data was used, comparing and contrasting criminal behaviour alongside the release of video games across the country. A time-series regression-analysis was used to do this. Across the entire study, a total of 50 million crimes, conducted over 35 US states were analysed. It was found that the release of violent video games has a positive correlation with an overall increase of crime in the weeks that followed the games release. Criminal behaviour increased for both young people and adults, but the increase in criminal behaviour for young people was four times greater than for adults. On the other hand, it was discovered that the release of best-selling nonviolent video games had no correlation with a change in criminal behaviour levels during the weeks that followed. The results of Impink et al suggested that the release of violent video games increases the rate of crime amongst young people. It was noted that the results of this study were completely moderated in US counties that forbid alcohol sales. This suggests the notion that alcohol consumption is a necessary ingredient for young people who are exposed to violent video games to commit crime.

Impink et al conducted a review of 50 million crimes, across 35 different US states. This is a large sample size, which increases the reliability of the study. However, having a sample size this large means that it would be incredibly difficult to repeat the study to re-test its findings. The findings are relevant to the research question. This study highlights a distinct positive correlation between violent video games and criminal behaviour, with this link being even stronger in young people. The study provides further insight into the study of violent video games and crime, by highlighting the lack of presence of alcohol within the study. Further research into this area would be required to give more clarity of the effect that alcohol has on young people whilst playing violent video games. This would, however, be a difficult variable

to measure due to the ethical concerns of providing young people with alcohol. Furthermore, Impink et al focused solely on major releases of games. This was a conscious decision made to gauge the effects that these releases had on the subsequent crime rates. The exclusion of such events could be seen as a limitation of Impink et al, as the number of events used to measure crime rates was lowered. It could be argued that this lower sample of video game releases results in lower generalisability for the findings.

3.3 Smith et al (2018): A longitudinal analysis of shooter games and their relationship with conduct disorder and self-reported delinquency

In 2018, Smith et al conducted a longitudinal analysis of shooter games and their relationship with both conduct disorder and self-reported delinquency. Conducted in the United Kingdom, Smith et al (2018) analysed quantitative data from 14,541 pregnant female residents of Avon, UK. The total number of participants was increased later in the study to 15,445. The age range of the participating children spanned between aged 5-15.5 years old, with 50.6% of these participants being male. Delinquency traits of the participants were assessed at age 15 years and six months old. Participants answered a 12 item Likert-style questionnaire, with a total delinquent trait score calculated for each. The effects of independent and confounded variables were compared using Analysis Multivariate Poisson regressions alongside the correlation matrix. The results of the study revealed that early childhood mental health symptoms, such as depression, ADHD and early conduct disorder were moderate predictors of criminal activity in later youth. Despite this, no evidence was found to suggest that shooter games were a predictor of adolescent criminal activity. It was concluded that violent video games play little to no part in youth psychopathy or criminal behaviour. A lack of positive correlation to shooter games and future criminal behaviour was noted as something that could be better understood within the context of the Catalyst Model.

The work of Smith et al used a sample size of 15,445 children. This is a large study, and so it could be argued that findings of this study are generalisable to that of a larger population. Furthermore, the study was conducted in the UK. This means that the findings of Smith et al could be more relevant to the research question than that of Impink et al. However, an overwhelming percentage of participants (99.8%) of the study were White Europeans. This is not an accurate reflection of the diversity of young people within the UK, which implies that further study within this area needs to be undertaken with a specific focus on a more geographically accurate sample of participants. The findings are relevant to the research question due to the strong correlation between the study of young people's use of violent video games in relation to crime. Impink et al highlights the necessary need for a potential change in recruitment when conducting similar studies. This could potentially result in a more diverse sample of participants, which would produce results that have greater comparability to other studies. This study highlights the need for the effects of ADHD on young offenders to be further examined. Implications of such research could result in early intervention, which would aid the prevention of youth crimes.

3.4 Ferguson (2011): Video Games and Youth Violence: A Prospective Analysis in Adolescents

Ferguson (2011) believed that frequent exposure to violent video games would cause an increase in subsequent aggressive behaviour. This hypothesis was investigated with standardized scripted interviews, which measured both quantitative and qualitative data. A sample of 603 Mexican children was used to collect this data. The young people who were interviewed were aged between 10-14, with 52.3% being females. Of this sample, 96.8% were of Hispanic ethnicity. Aggression levels were measured using a 29 item Likert scale questionnaire. Before conducting the study, it was noted that no previous research had employed the use of well validated measures of youth violence. They had also not considered video game violence effects within the context of other influences on young people, including

the likes of depressive symptoms, peer delinquency and family environment. It was found that 7.3% of children surveyed reported engaging in a minimum of 1 violent criminal act during the last 12 months. It was also discovered that levels of a young person's depressive symptoms were found to be a strong predictor of high aggression and violence levels across most outcome measures. Depressive symptoms were found to have a strong positive correlation with antisocial traits, suggesting that antisocial individuals with depressive symptoms were most likely to submit to youth violence and hostility. However, a link between violent video games and youth crime was not found to be a predictor of youth crime.

The work of Ferguson measured both quantitative and qualitative data of young people in the form of standardized scripted interviews. The combination of quantitative and qualitative data means that the answers given by the young people can be analysed in greater detail, allowing for a deeper understanding of factors that contribute towards youth crime. The findings do provide valuable insight when examining the research question as they shine a light on the effects that other factors have on a young person's chance of committing crime. The most notable of these being peer delinquency. This highlights a clear need for more research to be undertaken into the effects of social learning theory amongst young people. A deeper understanding of the effects of social learning theory amongst young people could contribute towards young people making better informed decisions when spending time with their peers, as well as the video games that they play.

3.5 Olson et al (2004): Media Violence Research and Youth Violence Data: Why Do They Conflict?

In 2004, Olson et al conducted a systematic review of the similarities and differences between media violence research and youth violence data. Before undertaking this research, it was noted that there was a large split between those who believe violent video games are harmful towards

young people and those who believe that they are not. It was stated that a previous report on youth violence reviewed effects of exposure of violent media towards young people. In the report, evidence was found for a small to moderate short-term increase in physically and verbally aggressive behaviour in young people when playing violent video games. This is in correlation with findings that 30% of young people reported being bullied, being the bully themselves or both. This was found to be a result of increased aggression levels within young people. However, findings from studies that were experimental, longitudinal and cross-sectional suggest that video game violence has a relatively small impact on subsequent violence and aggression amongst young people. Olson et al stated that research into media violence needs to be investigated further, and that to do this it needs to be put into greater context. Many known risk factors for violence cannot be changed or altered, whilst exposure towards media can be. Video games and other forms of media violence could have less visible harmful effects on children's lives, despite not featuring in most headline-making crimes. They concluded that it is very difficult to understand whether violent video games contribute to youth violence or not.

Olson et al conducted a systematic review, which resulted 43 studies being examined. Having a sample size as high as this means that the work can be generalized to that of a larger population. The relevance of this research provides a valuable insight into the need for more research needing to be undertaken within the area of violent video games and crime. It was, however, explained that this would be "impractical and expensive". The effects of violent video games found within this research were said to be secondary effects, meaning that they were not obvious to the casual viewer. They finished by suggesting that studying how violent video games may contribute to some types of everyday violence would be a feasible and practical next step within the line of research. Based on the work of Olson et al, it would also be useful to understand how much time spent playing violent video games affects individuals, rather than

just playing them in general. It was hypothesised that individuals who spent unsociable hours playing video games were more likely to have causational factors such as maternal/paternal deprivation, and so family studies needs to be a factor researched more heavily when investigating violent video game play and criminality within young people.

3.6 Ward (2011): Video Games and Adolescent Fighting

Ward (2011) investigated violent video games in correlation with adolescent fighting. Tests were implemented to measure a potential link between playing violent video games and levels of crime and mortality. Before undertaking any research, it was hypothesized that unconditional correlations overestimated the link between violent video games and subsequent violent displayed by the individual. A count data panel estimator was used to measure the number of crimes by category and the mortalities of various types to the number of video game stores. Analysis of the data conducted found that, for six out of eight measured categories of crime, there were significant reductions in crime rates in areas that had a larger amount of game stores. In addition to this, it was noted that mortality rates also fell in areas that had a larger number of game stores. In contrast to this, proxies for other teen or young adult leisure activities, such as sports stores and movie theatres, exhibit either no similar effect or a smaller effect. It was also discovered that there is a significant positive correlation between violent video games and crime, however, this link was only found by those who were deemed as “heavy users” of the violent video games. It was found using robustness checks that these findings were not likely to be the result of reverse causality. Furthermore, a delve into the effect that sports had on young people found that young people who had access to sport saw a 1% decrease in the probability of committing a violent crime.

Ward conducted this research through the use of a meta-analysis. This involves the collection and analysis of a multitude of studies, all of which were peer reviewed. This means that the

findings could be easily generalized due to the high sample size and quality of data examined. The findings contradict that of previous research. This study produces a valuable insight into the potential benefits of violent video games for young people. It was noted that individuals who played violent video games experienced a decrease in anti-social behaviours. They also noted that there was a decrease in criminal activity in areas of which there were a high number of video game stores. This work offers a fresh perspective into the potential benefits of violent video games on young people. This study directly contradicts the work of the General Aggression Model (GAM), stating that exposure to violent video games does not result in young people exhibiting aggressive or violent behaviour. The work of Ward also highlights a need for further research into the benefits of sports on young people, particularly in relation to criminal behaviour. Gaining further understanding of this could be valuable in the prevention of future criminal acts committed by young people.

3.7 Ferguson et al (2014): Violent Video Games, Catharsis Seeking, Bullying, and Delinquency: A Multivariate Analysis of Effects

In 2014, Ferguson et al investigated the effects that violent video games had on the levels of delinquency displayed by young people in the USA. Before conducting the study, they hypothesized that any relationship between playing violent video games and youth delinquency would be moderated by other relevant third-party variables: potential risk and proactive factors such as base aggression levels, family environment, stress, participation in extracurricular activities and perceived levels of support from friends and family. This study used a sample of 1254 12–14-year-old students, with 47% of these being males. Of these, 53% were from a comparatively affluent school, whereas 47% were from a school in an area with a lower socioeconomic status. It was also noted that 90% of all students taking part in the study were of white ethnicity. Before undertaking the research, it was stated that there are several concerns surrounding previous research of video game violence. One of these was that many of the

aggression measures used demonstrated a poor validity, with the idea that many measures used in video game studies claiming to represent aggressive behaviour did not accurately correlate with real-life acts effectively. Students answered four Likert scale questionnaires that measured delinquency, aggression when angry, bullying and catharsis seeking. Ferguson et al found that there was little evidence to promote the assertion that violent video games were an effective predictor for youth delinquency and deviant behaviours. However, they did establish a strong positive correlation between violent video games and anger, with aggression levels rising by 58% amongst young people playing violent video games.

The work of Ferguson et al used a sample of 1254 students. This is a large sample size and enables the findings to be compared and contrasted with larger studies. Furthermore, the sample of students used was a diverse one, with an almost even split between female and male participants (47% male) and a similar split in terms of socio-economic status of the students (53% affluent). This means that the results could have a higher validity than previous studies. The data collected from the students was in the form of a Likert scale questionnaire, and having this quantitative data makes it easier to compare findings between the students from each school. Unlike previous research, the findings of Ferguson et al shed light on the need for further investigation into other third-party variables that could affect a young person's likelihood of committing crime alongside violent video games. Such investigations could prove vital in understanding the true implications of the effects that violent video games have on young people when variables such as an individual's socio-economic status and family status are more heavily researched.

3.8 Ybarra et al (2022): Violent Media in Childhood and Seriously Violent Behavior in Adolescence and Young Adulthood

Ybarra et al (2022) measured the effects of violent media in childhood and seriously violent behaviour in adolescence and young adulthood on an individual's likelihood of committing crimes. Data was collected via an online questionnaire sent out to students all over the USA. Follow up data was collected from the students ten years after giving the initial data. This longitudinal study recruited 1586 child-caregiver pairs via email. Each child was, at the time, aged between 10-15 years old, a fluent English speaker and had access to the internet at least once in the previous 6 months. The young people reported the amount of violence they were exposed to across five distinct types of media: video games, television, websites of cartoons, music and websites of real people. It was found that the probability of reporting seriously violent behaviour over time was 2.45-fold higher with an increase in each one's baseline violent media exposure. They concluded that exposure to violent video games and other types of violent media in childhood may be an influencing factor on seriously violent behaviour in adolescence and adulthood, even for individuals who have different risk factors. It was noted that, whilst findings should be explored in further research with a wider number of participants, it would be recommended that paediatricians might collaborate with parents to identify a media consumption plan for their children. This would allow for minimized exposure to violence across the different media types and would be a feasible and realistic counter measure.

Ybarra et al selected the participants of the study via the use of random sampling. This means that there can be no potential researcher bias, as the researcher had never met the participants/caregivers. Furthermore, the study design employed the use of longitudinal data. Although this makes the work difficult to replicate, it means that the findings have a larger validity than other studies. Many previous studies have only measured short term aggression, and so the research provides a valuable insight into the long-term effects of exposure to violent

video games on young people. Being a longitudinal study, correlations are easier to analyse, and so Ybarra et al were able to explore a variety of outcome measures effectively. Despite being a longitudinal study, the young people who were surveyed only reported their exposure to violent video games, and not the amount of time that they were exposed to them for. Such an inclusion of data could prove vital in understanding the true effect that exposure to violent video games has on young people committing crimes.

3.9 Ybarra et al (2014): Video games and crime

In 2014, Ybarra et al investigated cross-sectional associations between violent video games and weapon carrying within a national cohort of children. Data was collected from young people aged between 9 to 18 years old, with these being surveyed nationally across a three-wave longitudinal study. The probability of carrying a weapon to school within the last month was measured in correlation with past-year exposure to violent content in video games, along with peer aggression and biological sex. The sample of participants included young people who were at risk of both the exposure to violent video games and who attended public or private school. Within the analysis, 3,397 observations from 1,489 young people were included. 1.4% of young people reported carrying a weapon to school in the last month, with 69% reporting that at least one video game that they had played depicted some form of violent behaviour or aggression. Once other potentially influential characteristics had been adjusted for, playing at least one violent video game within the past twelve months positively correlated with a 400% increase in the probability of also reporting carrying a weapon to school within the last month. The work of Ybarra et al supports the hypothesis that the probability of carrying weapons to school has a positive correlation with violent video game play. This is consistent with the predictive factors of social-cognitive and observational learning theory. On the contrary, 31% of young people surveyed reported that they did not play a single violent video game.

Ybarra et al noted that this study was one of the first of its kind, and as a result the findings of this study should be interpreted cautiously. A need for the study to be replicated was also highlighted. They included a data collection sample from young people aged between 9-18. This is quite a broad age sample, which makes it easier to generalize the findings of the study to young people across the rest of the world. This research provides a valuable contribution to the field of research, offering a fresh perspective on the implications that violent video game play can have on young people. It also reinforces the importance of the role that observational learning plays in the lives of young people. The results are consistent with media findings that violent video game consumption positively correlates with violent behaviour over a longer period. This correlational analysis highlights a further need for more longitudinal studies within this area. Such research could result in a greater understanding of the link between violent video games and criminal behaviour.

3.10 Ferguson et al (2011): Personality and media influences on violence and depression in a cross-national sample of young adults: Data from Mexican-Americans, English and Croatians

In 2011, Ferguson et al conducted a study that focused on personality and media influences on violence and depression in a cross-national sample of young people. Before conducting any research, it was noted that previous studies had focused a considerable amount of attention on the potential negative effects of violent media exposure on the psychological health of young people. It was also stated that previous studies within this area of research, particularly the earlier studies, relied heavily on bivariate correlations between violent media usage and negative results. When recruiting participants the researchers took a sample of 232 Mexican American young people from the south of the USA, with 43.1% of these being male. The English sample comprised of 150 young people attending university in London. The English sample was ethnically diverse, with only 39.3% of participants being “white British”. The Croatian sample had 455 young adults, 44.6% of which were male. Participants answered a

variety of Likert-scale questions in the form of questionnaires. It was found that 7.3% of children reported that they had engaged in a minimum of 1 violent crime within the last 12 months. Results suggested that, despite not considering the effects of personality variables, the correlational links between media exposure and violent acts are inconsistent and only had a small positive effect. Despite this, once personality variables were accounted for the correlation between media violence and violent acts no longer existed within the Mexican American and English samples. They concluded that exposure to violent media did not positively correlate with violence within young people.

The work of Ferguson et al does have limitations. Firstly, the sample of participants used was only a sample of college students, making it hard to generalize the findings of this study to other groups under the umbrella term of “young people”. Furthermore, the analysis of data was correlational in nature, meaning that no causal attribution should be implied or made from this work. The results of this research increase the notion that the effects of exposure to violent video games may have been exaggerated by the media and other researchers, and that this can be explained through the influence of personality variables. This study highlights that individuals who have specific personality traits may be more prone to engaging in violent or criminal acts. Overall, this research highlights a distinct need for the investigation into personality variables as an explanation for violence and criminal behaviour. A deeper understanding of the effects of personality variables could result in this being an effective predictor for youth crime alongside violent video game consumption.

3.11 Dill et al (2011): Recurrent Issues in Efforts to Prevent Homicidal Youth Violence in Schools: Expert Opinions

Dill et al (2011) investigated the recurring issues in efforts to prevent youth homicidal violence within schools. Before conducting any research, it was noted that previous research indicated

that the probability of arrest acts as a deterrent for young people, whereas the severity of the punishment does not. They conducted a meta-analysis in which multiple studies on youth violence crimes were compared. It was stated that punishments would likely have deterrent effects if those offending believed that they had a high probability of being caught. Some young people may have a difficulty understanding the risk of being punished and arrested, due to their psychosocial state and their general brain immaturity. Other factors that were found to affect this were their susceptibility to peer pressure and the idea of focusing on the short-term benefits of committing the crime, rather than acknowledging the potential consequences of their actions. An examination of six large-scale studies within the meta-analysis found that there were higher rates of recidivism amongst young people convicted of violent crimes in criminal court compared to those that were tried in the juvenile court, suggesting that stigmatization and labelling may result in self-fulfilling prophecy. Dill et al concluded that violent video games do not directly cause young people to commit crime in isolation. However, it was noted that violent video games could be classed as “noteworthy” in the progressive build up to this.

Overall, the work of Dill et al can be classed as significant in the investigation of youth recidivism rates in relation to young people playing violent video games. The insight into recidivism rates is not an area in which previous studies have delved into, and this highlights a need for further investigation into this. Looking at youth recidivism rates specifically would allow for a deeper understanding of how effective the preventative measures are for young people that have previously offended. Most young people reported that they believed that they would not be tried as an adult, and that committing these crimes would result in a lighter sentence, if any. Understanding this in the context of violent video games could allow for policymakers and game developers to make better informed choices about the content that they put into their games. Increasing preventative measures could also prove to be useful, as some of the young people studied highlighted low levels of empathy and responsibility for their

actions. Increasing these measures could result in young people having a higher sense of responsibility, thus being less likely to commit deviant acts.

Discussion

4.1 Findings

The aim of this study was to analyse previous literature to establish the relationship between violent video games and crimes being committed by young people. Throughout the results, there were a variety of conclusions found by researchers. Whilst some believed that consumption of violent video games could result in young people committing crimes (Impink et al, 2020), others found that violent video games play little to no part in criminal behaviour, with some even finding violent video games to have a positive effect on young people (Ward., 2011). The notion that violent video games can cause criminal behaviour within young people is a conclusion that has been found in a variety of other academic sources, with claims that access to such material at such an age can be extremely dangerous. (Anderson & Murphy., 2003; Fournis & Abou., 2014). On the other hand, other studies examining the effects of violent video games have concluded that they have a negative correlation with criminal behaviour within young people, suggesting that these have positive benefits for individuals engaging with the games (Cunningham et al, 2011; McCaffree & Proctor., 2017).

The GAM was used in most of the studies present within the Literature Review. Studies that found an increase in aggressive behaviour in young people after playing violent video games also discovered that this positive correlation was consistent with the GAM. Further analysis of the GAM in correlation with violent media usage has found strong, well-established effects with four effects of violent media usage leading to aggressive behaviour. These include; aggressive cognition, desensitisation to violence, empathy deficit and aggressive affect (Anderson & Bushman, 2017). This suggests that the GAM is an effective tool as a predictor

of aggression and aggressive behaviour amongst young people within the context of violent video games.

The notion that violent video games could benefit the lives of young people is one that is contrary to previous research. Copenhaver et al (2017) state that studies that gained high media attention and newspaper coverage were those that were deemed to have poorer quality in both their methodology and findings. The concept that previous findings have been overinflated is one that needs further investigation. More research into this area could result in a higher level of clarity into the potential benefits of violent video games on young people.

Figure 2 was created to analyse each study within the literature review, with each criteria being given a score of 1-10 (with 10 being the highest scoring and 1 being the lowest, based on the strength of the study). Overall, the majority of studies that were deemed to be the highest-scoring were those that boasted a high sample size ($n > 1000$).

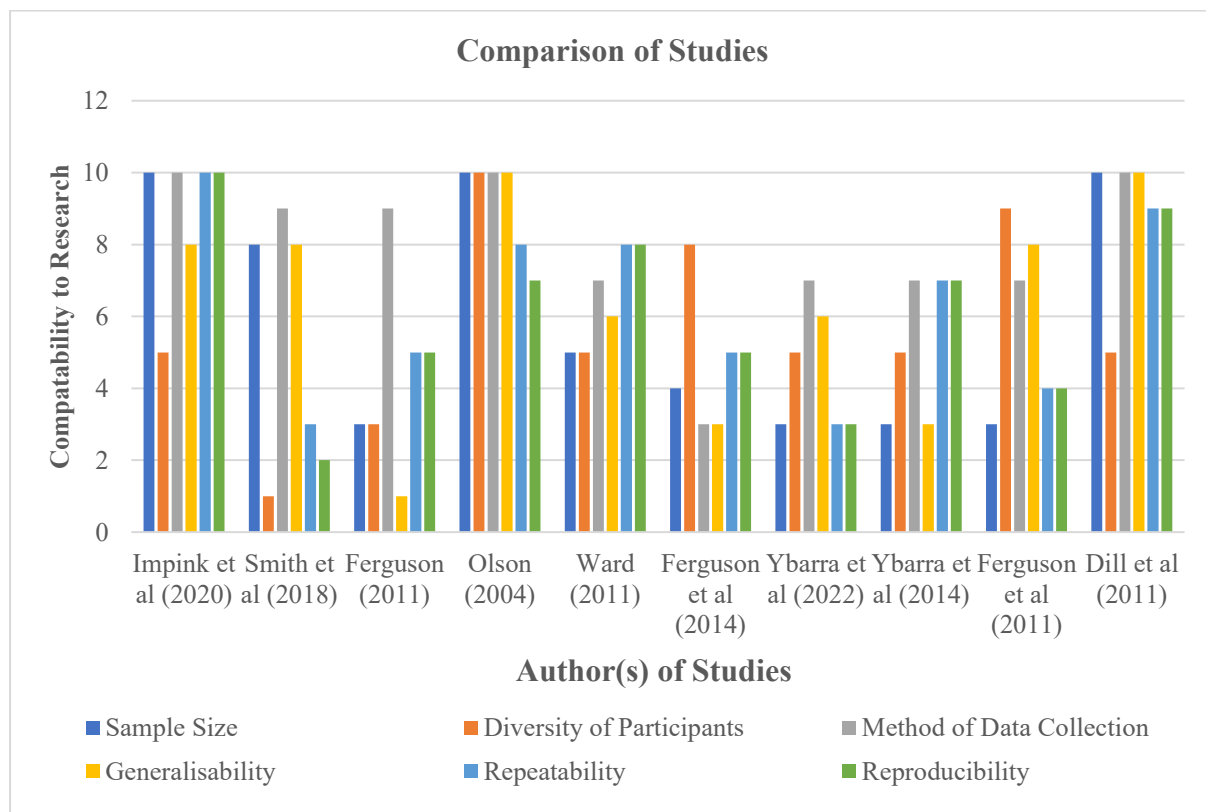


Figure 2: *A graph comparing and contrasting key areas of analysis for each study within the literature review.*

Generally, studies that had a higher sample size tended to have higher diversity of participants. This positively correlated with high generalisability, as having a wider variety of participants meant that findings could be generalised to a larger population. All studies scored well for method of data collection, suggesting that research into this area is conducted by using a wide variety of methods, mainly including Likert-style questionnaires. Despite longitudinal studies having a higher generalisability, these studies are significantly harder to replicate. As a result, repeatability and reproducibility of these studies would be significantly more challenging.

4.2 Implications of Findings

The findings of this research provide insight into the effects that violent video games can have on young people. Despite not having a universally conclusive link between violent video games and criminal behaviour, there has been compelling evidence to suggest that violent video games do cause young people to become more aggressive (though see Boduszek et al., 2019). Paired with the work of the GAM, it could be believed that the baseline aggression a person has, combined with the increased aggression due to violent video game consumption, could be contributing factors towards some young people committing crimes. Despite some researchers having doubts about the ability of the GAM as a tool for predicting aggressive behaviour (Ferguson & Dyck, 2012) the GAM has been found to be an effective method for prediction of aggressive behaviour. Having a clearer understanding of the GAM could contribute towards videogame makers reviewing the content of their games more thoroughly. A deeper review of content being published so accessibly could result in less violent content being consumed by young people. This could mean fewer young people are exposed to media which will increase their baseline aggression, which may result in them committing less crimes.

Having established a positive correlation between violent video games and aggressive behaviour within young people, trends were also established between aggressive behaviour and crime. Identifying that violent video game consumption can potentially result in young people committing crimes is essential to our criminal justice system. Understanding this link could be vital when introducing criminal prevention strategies for young people (Zhao et al, 2021). Implementing such measures could result in fewer young people being exposed to violent media content, thus engaging in less criminal behaviour.

One of the factors that was found to increase a young person's susceptibility to the effects of violent video games was time spent playing them. This was found to be consistent within further literature (Lee et al, 2021). Whilst it is impractical for game developers to introduce mechanisms preventing young people for playing beyond a specified time, findings of this research could help educate both young people and their parents on the potential risks of violent video games. As a result, this research could be used to help young people and their parents make better-informed choices about their video game consumption.

4.3 Ethical Implications

Throughout the entirety of the research, all BPS guidelines were strictly adhered to. The idea that violent video games can have a negative effect on young people raises the question about their morality. Young people can access violent video games with relative ease in the modern day, with some being able to purchase these over the internet without any need for identification. With ever-growing concerns that violent video games are causing young people to become more aggressive and antisocial, questions are being raised about the accessibility that young people have to such violent content (Konjin et al, 2007). It could be argued that policymakers need to make the accessibility of violent video games more difficult for young

people. Limiting such accessibility would result in less young people playing violent video games. This could, in turn, result in less violent crimes being committed by them.

4.4 Methodological Limitations

The majority of research conducted within the literature review was done via the use of questionnaires, with a limited number of these being longitudinal studies. The lack of longitudinal studies within the literature review means that the results of these studies become harder to generalize to a larger population. However, longitudinal studies are harder to replicate than most studies within the literature review since they are so time-consuming. It could therefore be argued that research of this nature would be more difficult to compare with other studies.

Throughout the literature review, the conception that other environmental factors play a pivotal role in the development of young people committing crimes was addressed. Some of these factors included the likes of: family situation, peer behaviours and previous aggressive/violent behaviour. Such factors can have a contribution towards young people committing crimes, and therefore the notion that violent video games are the only factor that contributes to young people committing crimes is one that cannot be proved.

The research conducted throughout the systematic review included studies conducted outside of the United Kingdom. Despite many of these studies being UK based, some were conducted in other nations, such as the United States of America and Croatia. Whilst these are ecologically similar, it could be argued that findings of this research could be less generalisable to the population of the United Kingdom due to some research into this area being conducted elsewhere.

4.5 Recommendations for Future Research

In 2021, China implemented new regulations which prevent young people from gaming excessively. This new rule means young people are only able to access video games for 1 hour per day. Aiming to protect young people against mental ill health, this policy seeks to limit the exposure to violent video games that young people have (Kattula et al, 2021). This has seen students in China form a good understanding of the effects of depression and antisocial behaviours, which means that they are able to see the potential negative effects that violent video games can have on them (Salleh & Abdul Ghani, 2022). This shows that the new gaming restrictions implemented by China are found to be an effective prevention method of crime amongst young people.

With a lack of longitudinal studies present within the literature review, this area could benefit from studies that measure the effects of violent video games on young people over a longer period. Many of these studies gather one-off results over the course of a day. Whilst helpful in the understanding of the effects that violent video games can have, it could be argued that the findings of these studies are harder to generalise to a larger population due to their design. An increase in longer, more thorough measures could result in more generalisable findings. However, studies of this nature are more costly, and so this could be harder for individuals to undertake this research.

If we are to understand the effects violent video games have on young people, we must first understand why they wish to play them. Understanding the reason why young people play violent video games could be key when trying to limit their effects, as well as introducing prevention methods. Jansz (2006) argued that violent video games provide gratification for the experience of multiple emotions. With gamers largely in control, violent video games leave them with a sense of freedom, which is particularly attractive to those who are struggling with

their personal identity (Sherretts & Willmott, 2016; Barnett et al., 2021). Further research into the reasons why young people seek to immerse themselves in violent video games could prove vital in the quest to safeguard them from harm and prevent them from engaging in subsequent criminal behaviour.

As per Figure 3, Olson et al (2004) had the highest mean score of all studies, with a rating of 9.16 out of 10. This is due to the fact that the method of data collection was a meta-analysis. The other study that used this design was Impink et al (2020), who scored 8.83. It could therefore be argued that future research should be undertaken with a meta-analytical approach in order to increase the validity of the studies. Further research into this area must also consider a change of method when selecting participants, as this was a notable weakness of the studies present within the literature review. A diverse selection of participants would result in higher generalisability of all future findings. Future research must also investigate the effects that nonviolent video games have on young people committing crimes. This will prove vital in understanding the effects that violent video games truly have.

Conclusion

Overall, it has been difficult to establish a direct link between violent video games and crime. Whilst some argue that there is a strong positive correlation, others have stated that violent video games have benefits to young people, and that the effects of these benefits need to be explored in more detail. The link between violent video games and aggression has been established, with multiple sources stating that violent video game exposure leads to increased aggression levels. This co-insides effectively with the GAM, which was found to be an effective tool as a predictor of aggression within young people. A link was also established between aggression levels and criminal behaviour. Whilst there is not conclusive evidence that violent video games cause young people to commit crimes, it could be suggested that violent

video games cause young people to be more aggressive. Indirectly, this heightened level of aggression, combined with other external factors, could cause criminal behaviour amongst young people. These external factors include the likes of a young person's family situation, socio-economic status and biological status. These effects need to be investigated further to fully understand how much of an impact that they have on a young person committing crimes, alongside violent video game exposure.

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