

## The School Shooting/Violent Video Game Link: Causal Relationship or Moral Panic?

CHRISTOPHER J. FERGUSON\*

*Behavioral, Applied Sciences and Criminal Justice Department,  
Texas A&M International University, Laredo, TX, USA*

### *Abstract*

*In the last 10 years, following the incidence of serious acts of school violence—particularly multiple homicides on school campuses—much attention has focused on the potential causal role of violent video game exposure. Some scholars have attempted to draw links between laboratory and correlational research on video game playing and school shooting incidents. This paper argues that such claims are faulty and fail to acknowledge the significant methodological and constructional divides between existing video game research and acts of serious aggression and violence. It is concluded that no significant relationship between violent video game exposure and school shooting incidents has been demonstrated in the existing scientific literature, and that data from real world violence call such a link into question. Copyright © 2008 John Wiley & Sons, Ltd.*

**Key words:** computer games; violence; aggression; school violence; mass media

### INTRODUCTION

Following the April 2007 Virginia Tech massacre, in which Seung-Hui Cho killed 32 students and professors, considerable debate emerged regarding the impact of violent video games and other forms of violent media as a causal agent in such serious violent acts. Related to the Virginia Tech shooting, pundits such as the lawyer and anti-game activist Jack Thompson and Dr Phil McGraw ('Dr Phil') appeared in national US media outlets stating that violent games were a significant causal factor (McGraw, 2007; Thompson, 2007). As a considerable majority of young males play violent video games (Griffiths & Hunt, 1995; Olson *et al.*, 2007) suggesting that a young male school shooter may have played violent games is hardly as prescient as it may seem on the surface. Thus, it was something of a shock when investigators concluded that Cho had little to no exposure to violent video games (Virginia Tech Review Panel, 2007). Similarly, Sulejman Talovic (age 18), who killed five in a Utah mall on February 12, 2007, was found not to be in

\*Correspondence to: Christopher J. Ferguson, Department of Behavioral, Applied Sciences and Criminal Justice, Texas A&M International University, Laredo, TX 78041, USA.  
E-mail: CJFerguson1111@aol.com

possession of computer or video games (Carlisle & Hunt, 2007). As of this writing, no evidence has emerged to suggest that the more recent (February 14, 2008) Northern Illinois University shooter, Steven Phillip Kazmierczak, was an avid player of violent games, although this may change with further investigation. These recent shootings differ markedly from the Columbine High shooting, in which the perpetrators Eric Harris and Dylan Klebold were known to have been avid players of *Doom* (Anderson & Dill, 2000). Although much speculation persists regarding the role of violent video games and school shootings, this speculation is seldom based on factual evidence. This paper will attempt to address this divide and bridge the gap between public debate and scholarly evidence.

## METHODOLOGY: IDENTIFICATION OF KEY RESEARCH

Research related to violent video games and aggression was broadly examined for relevant literature using search terms employed in previous meta-analyses of violent games (Anderson, 2004; Ferguson, 2007). To these search terms, targeted searches for (school shoot\* AND [video games OR computer games]) as well as (homicide AND [video games OR computer games]) were also conducted. Reference sections of all articles were further searched to gain a comprehensive base of literature for this review.

## THE RESEARCH ON VIOLENT VIDEO GAMES: A BRIEF OVERVIEW

Speculation regarding the potential link between violent video games and school shooting events is not limited to politicians and media 'talking heads'. Indeed, several scholars have explicitly linked academic research on violent video games with school shooting incidents (Anderson, 2004; Anderson & Dill, 2000). Bushman and Anderson (2002) suggest that even the 9/11 terrorist attacks are relevant to the media violence debate. Is there a basis for this generalisation, however?

Video game research tends to fall into two basic forms, experimental and correlational (which may include longitudinal designs). In most experimental designs, participants (usually college students) are exposed to either a violent or non-violent game, and then observed during some task that is presumed to be related, if only distantly, to aggression. Typical tasks have included delivery of non-painful white noise bursts during a competitive game (Anderson & Dill, 2000; Ferguson, Rueda, & Cruz, 2008a), filling in the missing letters in words (Carnagey & Anderson, 2006), or filling in the ending of ambiguous stories (Bushman & Anderson, 2002). Seldom are actual physical acts of aggression examined, as naturally, there are ethical constraints on the kinds of aggressive acts that can be examined in the laboratory. Results have generally been mixed, with some studies supporting a link between violent video games and minor acts of aggression (e.g. Anderson & Murphy, 2003; Carnagey & Anderson, 2006) and others finding no link (e.g. Ferguson, Rueda, & Cruz, 2008a; Unsworth, Devilly, & Ward, 2007), or even finding reduced aggression because of violent game exposure (Barnett, Coulson, & Foreman, 2008). At least one study (Anderson & Dill, 2000) purports to link games with aggression, yet a close examination of their results finds that their data does not support their conclusions (see Ferguson, Rueda, & Cruz, 2008a for a discussion).

Even if experimental results demonstrated greater consistency than they do, there are considerable difficulties in generalising the results from laboratory tests of aggression to

real world serious acts of aggression (Ritter & Eslea, 2005). Recent results, for instance, have suggested that the noise blast measure of aggression does not correlate with violent crimes or domestic violence (Ferguson, Rueda, & Cruz, 2008b). Nor do peer or teacher nominations of aggression seen in some research (Henry & Metropolitan Area Child Study Research Group, 2006). Thus, the generalisability of these results to real world acts of serious violence is dubious, even if these results were consistent as some have attempted to claim (e.g. Anderson, 2004).

Correlational research tends to produce weaker results than does experimental research (Ferguson, 2007). As with experimental results, correlational results are mixed with some studies finding a relationship between violent video games and aggression (e.g. Anderson & Dill, 2000; Gentile *et al.*, 2004), others finding no relationship (e.g. Ferguson *et al.*, 2008a; Williams & Skoric, 2005), and still others finding that violent games may *reduce* aggression (e.g. Colwell & Kato, 2003). Unfortunately, most correlational studies fail to take account of potentially confounding 'third' variables such as personality, family violence, or genetics. A few do, and consistently find that the link between video game violence and aggression is greatly weakened by the inclusion of 'third' variables. For instance, Ferguson *et al.* (2008a) find that family violence exposure, not video game violence, is predictive of violent criminal acts. Gentile *et al.* (2004) find that even including gender alone as a predictor variable greatly weakens the relationship between violent games and aggression. The only peer-reviewed longitudinal study on violent video games available thus far found no relationship between video game exposure and aggressive acts (Williams & Skoric, 2005), although this study lasted for only 1 month. One non-peer-reviewed longitudinal study did find a small association between video game playing and aggression (Anderson, Gentile, & Buckley, 2007), although this study poorly controlled for relevant third variables.

Recent meta-analytic results have also questioned the links between violent video games and aggression. Ferguson (2007) found significant problems in the violent games literature related to the use of unstandardised, unreliable aggression measures, as well as publication bias. Ferguson concluded that no causal or correlational relationship between violent games and aggression had been demonstrated through the current literature. Sherry (2007) came to a similar conclusion, suggesting even that the catharsis hypothesis (that violent games may *reduce* aggression) ought to be better examined than it has been in past research. In the most recent meta-analysis on violent media more generally (Savage, 2008), no relationship between consuming violent media and violent crimes was found. A recent review commissioned by the British government (Byron, 2008), although not a meta-analysis, also noted that the research on video games was unable to support a link with serious acts of aggression or violence, although continued self-regulation and the provision of high-quality ratings for parents of child consumers was recommended (a relatively non-controversial recommendation).

From this body of research, the empirical link between violent gameplay and serious acts of aggression or violent behaviour appears to be slim at best. However, most research done on violent games is conducted with 'normal' children or adults, and certainly not with individuals at high risk for school shootings. Whilst this limits the generalisability of existing video game research to the (very small) school shooter population, it also raises the question regarding findings in the literature on school shooters themselves. It could reasonably be argued that school shooters present a particular 'at risk' subgroup of individuals (primarily males) for whom violent video games may increase aggression, even if violent games do not increase aggression in 'normal' populations. Violent video games,

then, could be arguably synonymous to peanut butter: a perfectly harmless indulgence for the vast majority, but potentially harmful to a tiny minority.

### THE DATA ON SCHOOL SHOOTERS

Given that mass school shooters are a very small population of individuals, and given that all of them ultimately end up either dead or incarcerated (Jonesboro shooter Mitchell Johnson was released from juvenile incarceration on his 21st birthday, but has since been rearrested for several non-violent charges and awaits sentencing as of this writing; co-shooter Andrew Golden was also released and his whereabouts are not known to this writer), empirical research on school shooters specifically is understandably thin.

Reddy *et al.* (2001) discuss the issue of evaluating risk and threat of targeted school violence. As noted, each approach, such as risk assessment and threat assessment, carries certain benefits and risks. Many approaches, such as the identification of 'profiles' of school shooters, carry a significant risk of overidentification or false positives (Sewell & Mendelsohn, 2000). Furthermore, data collected regarding risk factors for other types of delinquency or aggression may not prove useful in the prediction of school shooting (Borum, 2000).

Probably the most comprehensive study of school shooters to date was conducted by the United States Secret Service and the United States Department of Education (2002). This report examined 37 school shooting incidents involving 41 perpetrators from 1974–2000. Primary data sources included police reports, school reports, mental health records, and interviews with 10 of the surviving perpetrators. In general, the report challenged the notion that a 'profile' of school shooters existed. Prior organisations such as the Federal Bureau of Investigations (1999) had attempted to respond to public demand by providing characteristics of 'at risk' individuals for serious acts of violence at school. Although the FBI cautioned against overuse of this 'profile', stating that it should be used only after an individual has made a threat in order to judge the credibility of the threat, the Secret Service report suggested that even this approach may have been of limited utility. Indeed, the Secret Service report suggested that school shooters were rather diverse, with the only 'predictive' theme being that many provided information or threats in advance about their plans.

The FBI report (1999) had included 'unusual fascination' with violent media amongst its potential predictors. As most young males consume considerable amounts of violent media (e.g. Griffiths & Hunt, 1995; Olson *et al.*, 2007), 'unusual' consumption necessitates reaching a very high bar. The report also suggests that incessantly reading/viewing a particular book or visual media with violent, or school violence content, may be a predictor. The FBI report appeared to focus on individuals who approved of hateful or destructive messages in the media, rather than merely enjoying the media for entertainment purposes. For instance, an individual who praised *Mein Kampf* and its message of racism and hatred would arguably be considered more 'at risk' than would someone who enjoyed playing the violent video game *Medal of Honor* because it was fun. Indeed, related to violent video games, the FBI report specifically stated, "The student spends inordinate amounts of time [although inordinate is never defined and is left subjective] playing video games with violent themes *and seems more interested in the violent images than the game itself*" [italics added]. Thus, an overall interest in causing harm is potentially predictive of violence, not exposure to violent media in and of itself, a conclusion supported by the recent Savage, (2008) meta-analysis. The FBI report also carefully notes that no one or two

predictors should be given unique weight, despite that this often happens in regard to violent games, with even some scholars pointing to video games as a unique link between school shooting cases (Anderson, 2004). The FBI report has come under some criticism, for the relatively low number of cases used in developing the profile (Reddy *et al.*, 2001).

Related to media violence generally, and video game violence specifically, the results from the Secret Service report (2002) were even more striking. Only 59% of perpetrators demonstrated 'some interest' in violent media of any kind (as compared to Griffiths & Hunt's 1995 results suggesting that over 90% of non-violent males play violent video games alone) including in their own writings. For video games, the figure was even lower—only 12%. Video games featuring person-on-person violence began to become widely available in the early 1980s with games such as *Castle Wolfenstein* (1981), *Chiller* (1986), *Swashbuckler* (1982), and others. The graphicness of such games increased in the late 1980s with games such as *Street Fighter* (1987), *Mortal Kombat* (1992), and *Doom* (1993). Three of the school shootings occurred before the widespread availability of violent games (one in 1974 and two in 1978) with two others (1985 and 1986) occurring before the release of *Street Fighter*. As these cases had either no or little access to violent games, they clearly should not be included in the percentile analysis on violent game interest. Readjusting for this fact, we find that the percentage of perpetrators with 'some interest' in violent games increases to only 14%. Removing three more (1987, 1988, and 1989) cases prior to the release of *Mortal Kombat* improves the percentile only to 15%. Thus, we can see that even removing individuals from the sample who are unlikely to have had access to violent games does little to influence the surprisingly low percentage of shooters with 'some interest' in violent games. Given prior data suggesting that the majority of young males play violent games (Griffiths & Hunt, 1995; Olson *et al.*, 2007), this data would seem to suggest that school shooters have *less* interest in violent games, not *more*. It is important to point out several caveats to this possibility, however, given the existing data. First, there is no study comparing school shooters to a contemporary group of non-pathological youth. Such a study would be the ideal standard by which to examine media consumption in school shooters. Secondly, the Secret Service's use of the terms 'some interest' is vague and difficult to quantify. It is worth noting that school shootings, such as that committed by Charles Whitman at the University of Texas in 1966, occurred long before the wide availability of video games. However, these results are not without precedent in other areas involving the intersection of media and violent crimes, as increased availability to pornography has been found to be associated with decreased sexual assault rates (Diamond & Uchiyama, 1999). Sex offenders have been found to have used *less* pornography, and been exposed to pornography later in life than non-offenders (Becker & Stein, 1991; Goldstein & Kant, 1973; Kendall, 2006; Nutter & Kearns, 1993; Walker, 1970).

Although these results are interesting and run contrary to much of the public discourse, it must be cautioned that there is a danger in comparing 'apples to oranges' in that the contrast is between two data sets, the Secret Service report and that by Griffiths and Hunt (1995) and Olson *et al.* (2007) with potentially different methods of data collection. However, it may be valuable to address this question by examining the video game consumption histories of non-violent controls and violent offenders to see how they may differ. Nonetheless, the evidence available to date on school shooters is not supportive of the hypothesis that their consumption of violent video games played an etiological role in the instigation of school shooting incidents.

## THE VIDEO GAME MORAL PANIC

In the 1980s, the paper-and-pencil board game *Dungeons and Dragons*, in which (to simplify the game quite a bit) players assume the roles of wizards, knights, and priests and slay monsters as part of an ongoing story, generated a substantial amount of controversy (Cardwell, 1994; Waldron, 2005). The game is highly immersive and featured demons and involved pagan-esque religions, and thus naturally attracted considerable condemnation from conservative religious groups concerned about Satanism and moral turpitude. Some therapists and mental health professionals worried about the game's impact on suicide and psychosis, particular given the oft-repeated but somewhat apocryphal view that 'kids can't tell fiction from reality' (this same belief was also applied to women during the 19th century, who it was believed would suffer ill effects from reading novels (Kirschenbaum, 2007)), although actual research on this phenomenon remained scarce (Waldron, 2005) and tended not to support the alarmist view. In this sense, the moral panic regarding *Dungeons and Dragons* differed from that regarding video games, in that the scientific community produced little research on the topic, one way or another. *Dungeons and Dragons*, despite its popularity, clearly never touched off a wave of child mental health problems or aggression and, save for a few ongoing religious commentaries, the controversy over *Dungeons and Dragons* has largely faded from view.

The emergence of violent video games appears unlikely to be the cause of any wave of child mental health problems, increased problems with aggression, or violent crimes amongst either youth or adults. Government agencies, from the Virginia Tech Review Panel (2007), to the United States Secret Service and United States Department of Education (2002), to the UK's Byron Report (2008) have found little evidence of violent games sparking an increase in youth violence or school shootings specifically. Why, then, does this discussion persist?

Several authors (Burns & Crawford, 1999; Gauntlett, 1995; Lawrence & Mueller, 2003; Sternheimer, 2007; Trend, 2007) have discussed mechanisms by which politicians, news media, and social scientists interact to cause a moral panic in the general populace. A moral panic occurs when a segment of society believes that the behaviour or moral choices of others within that society poses a significant risk to the society as a whole (Cohen, 1972; Gauntlett, 1995). Moral panics may emerge from 'culture wars' occurring in a society, although moral beliefs often become disguised as scientific 'research', oftentimes of poor quality (Gauntlett, 1995). Each of these groups, politicians, news media and social scientists, arguably has motives for promoting hysterical beliefs about media violence, and video games specifically. Actual causes of violent crime, such as family environment, genetics, poverty, and inequality, are oftentimes difficult, controversial, and intractable problems. By contrast, video games present something of a 'straw man' by which politicians can create an appearance of taking action against crime (Kutner & Olson, 2008). As for the news media, it has long been recognised that negative news ... including that which promotes extreme views of a potential problem, 'sell' better than do positive news (Surette, 2006). As such, news media and politicians may both pay greater attention to 'negative' news about video games than 'positive' news as it better suits their agendas. As for social scientists, it has been observed that a small group of researchers have been most vocal in promoting the anti-game message (Kutner & Olson, 2008), oftentimes ignoring research from other researchers, or failing to disclose problems with their own research. As some researchers have staked their professional reputation on anti-game activism, it may be difficult for these researchers to maintain scientific objectivity regarding the subject of



their study. Similarly, it may be argued that granting agencies are more likely to provide grant money when a potential problem is identified, rather than for studying a topic with the possibility that the outcome may reveal that there is nothing to worry about (this may be similar to pharmaceutical research in which pharmaceutical companies are more likely to fund researchers whose results are more friendly to their products, or publish research that is supportive rather than non-supportive [see Turner *et al.*, 2008]).

Figure 1 presents the 'Moral Panic Wheel', which has been adapted from Gauntlett's, (1995) theories about the origins of moral panic. In this model, 'societal beliefs', which may include 'commonsense notions', moral beliefs, religious beliefs, scientific dogma, and other beliefs, essentially 'spin the wheel' of moral panic. The populace begins to become concerned about something, in this case the media (although other issues such as immigration, race, homosexuality, etc., could also apply to this model), particularly something that is new, foreign, or alien. It may be more likely that societal 'elders' who are particularly unfamiliar with a new media technology, and perhaps wary of youth rebelliousness against the social order, are often the progenitors of a panic.

It has been the observation of this author, for instance, that the majority of individuals critical of video games are above the age of 35 (many are elderly) and oftentimes admit to not having directly experienced the games. Some commentators make claims betraying their unfamiliarity, such as that games like *Grand Theft Auto* 'award points' for antisocial behaviour (e.g. Dads & Daughters, 2008; Mello, 2004; Meltz, 2003) despite that few games award points for anything anymore, instead focusing on stories. Even *Grand Theft Auto* includes negative ramifications for antisocial behaviour, such as police

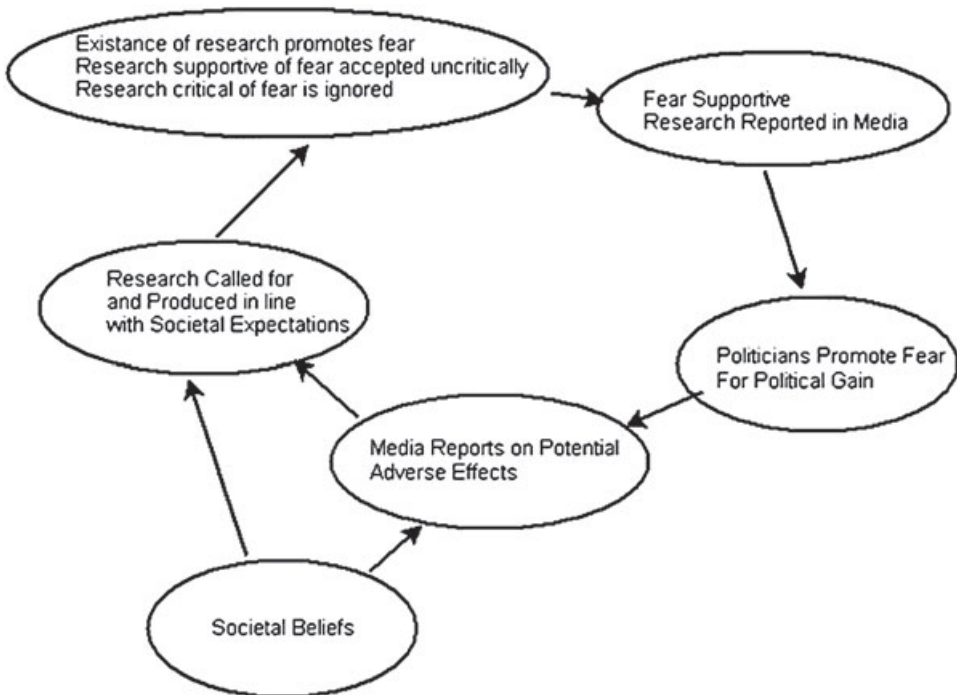


Figure 1. The moral panic wheel.

attention, and it would be more accurate to state that *Grand Theft Auto* does not prohibit antisocial behaviour, more so than awarding points for it. The player is left to make many decisions in this regard for themselves.

In one recent unfortunate incident, the psychologist Cooper Lawrence discussed the video game *Mass Effect* on Fox News and compared some scenes in the game to pornography (see [Gamepolitics.com, 2008a], which includes a partial transcript of the discussion). It quickly was revealed that Dr Lawrence had not actually played the game, and ultimately recanted her statements that were erroneous. It is quite possible that Dr Lawrence was 'tricked' in some way by Fox News, yet she also bears responsibility for commenting on a medium with which she was not familiar. It is to Dr Lawrence's credit, however, that she recanted her erroneous statements.

These societal beliefs become the basis for early news stories and calls for 'research' of the potential problem. As the moral panic develops, research is 'cherry-picked' that supports the panic. Research supportive of the moral panic is accepted without question (or thorough examination), whereas research suggestive that little problem exists is typically ignored (or at best, criticised and discarded). In at least one recent court case, it was pointed out that even some social scientists have cherry-picked data that support the panic view, ignoring unresponsive research (ESA, VSDA and IRMA v. Blagojevich, Madigan and Devine, 2005). The Illinois case cited above mentions this issue in several passages, noting that:

'With regard to their conclusions, Dr. Goldstein and Dr. Williams noted that Dr. Anderson not only had failed to cite any peer-reviewed studies that had shown a definitive causal link between violent video game play and aggression, but had also ignored research that reached conflicting conclusions. Dr. Goldstein and Dr. Williams noted that several studies concluded that there was no relationship between these two variables. They also cited studies concluding that in certain instances, there was a *negative* relationship between violent video game play and aggressive thoughts and behavior (e.g., initial increases in aggression wore off if the individual was allowed to play violent video game for longer period).' (ESA, VSDA and IRMA v. Blagojevich, Madigan and Devine, 2005, pp. 14–15).

The court also expresses similar concerns about cherry-picking of data by politicians involved in enacting anti-game legislation, noting (ESA, VSDA and IRMA v. Blagojevich, Madigan and Devine, 2005, p. 16):

'Finally, the Court is concerned that the legislative record does not indicate that the Illinois General Assembly considered any of the evidence that showed no relationship or a negative relationship between violent video game play and increases in aggressive thoughts and behavior. The legislative record included none of the articles cited by Dr. Goldstein or Dr. Williams. It included no data whatsoever that was critical of research finding a causal link between violent video game play and aggression. These omissions further undermine defendants' claim that the legislature made "reasonable inferences" from the scientific literature based on "substantial evidence.'

The media dutifully reports on the most negative results, as these results 'sell' to an already anxious public. Politicians seize upon the panic, eager to be seen as doing something particular as it gives them an opportunity to appear to be 'concerned for children'. Media violence, in particular, is an odd social issue with the ability to appeal both to voters



on the far right, who typically are concerned for religious reasons, and on the far left, who are typically motivated by pacifism (for a discussion of the influence of politics on psychological science, see Redding [2001]).

The unfortunate result of this moral panic wheel is that mistaken beliefs are promulgated in the general public and the hysteria sown for the gain of the news media, politicians, and some activist scholars. The cost comes in reference to personal freedoms, the threat of increased government intrusion in parenting (i.e. the so-called 'Nanny State'), and loss of credibility for social science (e.g. Sikes, 2008) once the most dire of predictions do not come true (as is already the case in regard to video games).

The reality is that (as presented in Figure 2, data from Childstats.gov, 2007; Entertainment Software Association, 2007), as violent video games have become more prevalent, violent crimes have decreased dramatically. This is true both for police arrest data, as well as crime victimisation data. Similar statistics for reduced crime have been found in Canada, Australia, the European Union, and the United Kingdom using both arrest and victimisation data (Nicholas, Kershaw, & Walker, 2007; van Dijk, van Kesteren, & Smit, 2007). This is certainly not to say that violent video games are necessarily responsible for this decline, even partially. However, this certainly cuts away the basis of any belief that violent games are promoting societal violence. The correlation (an astonishing  $r = -0.95$ ) is simply in the wrong direction. This would be akin to lung cancer *decreasing radically* after smoking cigarettes was introduced into a population, which is simply not the case.

Almost all research on video game violence examines 'normal' populations of individuals. Unfortunately, little research has examined the possibility that, whilst most children are unaffected by violent video games, small groups of children with existing problems may be 'at risk'. Only further investigation will elucidate whether this is a possibility.

School shootings, although exceedingly rare, are an important issue worthy of serious consideration. However, for our understanding of this phenomenon to progress, we must

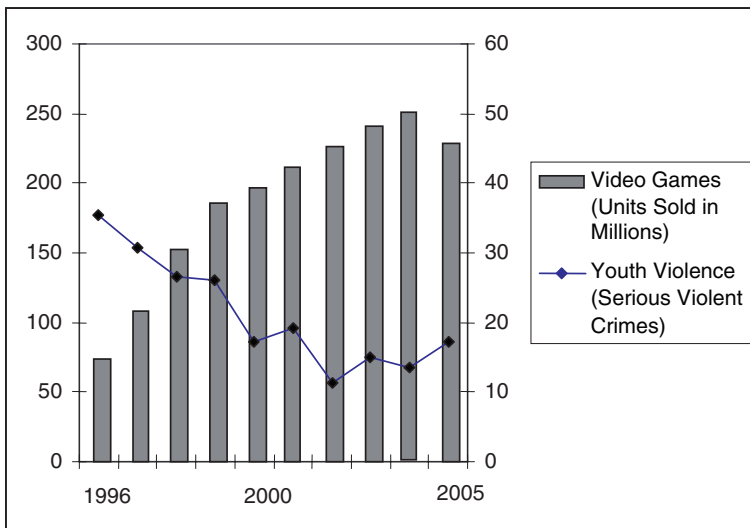


Figure 2. Youth violence and video game sales data.

move past the moral panic on video games and other media and take a hard look at the real causes of serious aggression and violence. A recent editorial in the medical journal *The Lancet* (2008) suggested that the time may have come to move beyond research focusing on media violence, generally, as a cause of serious aggression. As presented here, the wealth of evidence, from social science research on video games, to governmental reports and legal cases, to real world data on crime, fails to establish a link between violent video games and violent crimes, including school shootings. The link has not merely been unproven; I argue that the wealth of available data simply weighs against any causal relationship.

Regarding the investigative implications of this conclusion, I argue that excessive investigative focus on potential violent game effects are a poor use of police resources. Given that the majority of young males play violent video games (Griffiths & Hunt, 1995; Olson *et al.*, 2007), 'linking' an individual crime to violent games easily risks the investigative equivalent of a type I error. Such errors may mislead the public, contribute to unnecessary panic, and focus attention away from real social issues that contribute to youth crime. This is true also in cases in which perpetrators themselves claim to have been influenced by games. In the US, this occurred recently in a June 2008 'crime spree' by six youths, in which one youth made a reference to *Grand Theft Auto*, (Gamepolitics.com, 2008b). In this recent case, police alleged that one of the suspects made comments suggesting that he was mimicking the game *Grand Theft Auto IV*, although the police also noted that several of the youths had previous criminal records. The police have, at the time of this writing, not made the youth's comments publicly available. However, it is common for criminal offenders, once caught, to cast blame for their own actions on multiple external causes, oftentimes their victims, their parents, peers, alleged mental illnesses, society as a whole, etc. Blaming video games is simply 'more of the same' and it is remarkable that law enforcement officers would consider offender statements to the effect of blaming games as credible, when statements blaming other sources would likely be viewed as non-credible.

In regard to offender profiling, if profiling must be undertaken for school shooters (and with data currently available, it is not recommended by this author), the issue of video game exposure should be discarded as a facet of any such profiles. There simply is no quality evidence for the predictive value of violent game exposure as a risk factor for school shootings. Indeed, the risk of false positives is significant, even when considered in light with other variables (the inclusion of even one or two 'universal variables', that is, variables that are near universally true for the population of interest, give the illusion of multiple risk factors when considered in combination). Even if the focus is on 'incessant' interest in violent games, most elders (teachers, parents, psychologists, etc.), as unfamiliar with game culture as most are, simply lack the perspective to evaluate what constitutes 'incessant' interest, and what is developmentally normal or even healthy. Again, aside from individuals who claim in advance that they are going to commit a school shooting, it is argued here that not enough data exists to suggest that a consistent 'profile' of potential school shooters exists that would avoid significant risk of false positives. Certainly, the inclusion of violent game exposure as a potential risk factor worsens the predictive utility of any such profile.

This review of violent video games and school shootings is viewed as a platform for further discourse and research, as well as a potential source of information for public policy. If further debate on violent video game effects is stimulated by this paper, its mission will have been largely achieved.

## REFERENCES

- Anderson, C. (2004). An update on the effects of playing violent video games. *Journal of Adolescence*, 27, 113–122.
- Anderson, C., & Dill, K. (2000). Video games and aggressive thoughts, feelings and behavior in the laboratory and in life. *Journal of Personality and Social Psychology*, 78, 772–790.
- Anderson, C., & Murphy, C. (2003). Violent video games and aggressive behavior in young women. *Aggressive Behavior*, 29, 423–429.
- Anderson, C., Gentile, D., & Buckley, K. (2007). *Violent video game effects on children and adolescents: Theory, research and public policy*. Oxford: Oxford University Press.
- Barnett, J., Coulson, M., & Foreman, N. (2008, April). The WoW! factor: Reduced levels of anger after violent on-line play. Poster presented at the British Psychological Society Annual Meeting, Dublin, Ireland.
- Becker, J., & Stein, R. (1991). Is sexual erotica associated with sexual deviance in adolescent males? *International Journal of Law and Psychiatry*, 14, 85–95.
- Borum, R. (2000). Assessing violence risk among youth. *Journal of Clinical Psychology*, 56, 1263–1288.
- Burns, R., & Crawford, C. (1999). School shootings, the media, and public fear: Ingredients for a moral panic. *Crime, Law and Social Change*, 32, 147–168.
- Bushman, B., & Anderson, C. (2002). Violent video games and hostile expectations: A test of the generalized aggression model. *Personality and Social Psychology Bulletin*, 28, 1679–1686.
- Byron, T. (2008). Safer children in a digital world: The report of the Byron review. Retrieved April 1, 2008 from <http://www.dcsf.gov.uk/byronreview>
- Cardwell, J. (1994). The attacks on role-playing games. *Skeptical Inquirer*, 18, 157–165.
- Carlisle, N., & Hunt, S. (2007). Trolley Square: A search for answers. *The Salt Lake Tribune*. Retrieved April 3, 2008 from [http://www.sltrib.com/weather/ci\\_5230906](http://www.sltrib.com/weather/ci_5230906)
- Carnagey, N., & Anderson, C. (2006). The effects of reward and punishment in violent video games on aggressive affect, cognition and behavior. *Psychological Science*, 16, 882–889.
- Childstats.gov. (2007). America's children: Key national indicators of well-being, 2007. Retrieved December 10, 2007 from <http://www.childstats.gov/>
- Cohen, S. (1972). *Folk devils and moral panics*. London: MacGibbon and Kee.
- Colwell, J., & Kato, M. (2003). Investigation of the relationship between social isolation, self-esteem, aggression and computer game play in Japanese adolescents. *Asian Journal of Social Psychology*, 6, 149–158.
- Dads and Daughters. (2008). Baseball and violence against women don't mix. Retrieved July 21, 2008 from <http://dads.e-actionmax.com/showalert.asp?preview=1&aaaid=359>
- Diamond, M., & Uchiyama, A. (1999). Pornography, rape and sex crimes in Japan. *International Journal of Law and Psychiatry*, 22, 1–22.
- ESA, VSDA and IRMA v. Blagojevich, Madigan and Devine. (2005). Case No. 05 C 4265.
- Entertainment Software Association. (2007). Sales and genre data. Retrieved December 14, 2007 from <http://www.theesa.com/facts/index.asp>
- Federal Bureau of Investigations. (1999). The school shooter: A threat assessment perspective. Retrieved April 3, 2008 from <http://www.fbi.gov/publications/school/school2.pdf>
- Ferguson, C. J. (2007). Evidence for publication bias in video game violence effects literature: A meta-analytic review. *Aggression and Violent Behavior*, 12, 470–482.
- Ferguson, C. J., Rueda, S., Cruz, A., Ferguson, A., Fritz, D., & Smith, S. (2008a). Violent video games and aggression: Causal relationship or byproduct of family violence and intrinsic violence motivation? *Criminal Justice and Behavior*, 35, 311–332.
- Ferguson, C. J., Rueda, S., & Cruz, A. M. (2008b, February). Executive functioning, impulsive aggression and the validity of a laboratory based aggression paradigm. Poster presented at the International Neuropsychological Society 36th Annual Meeting, Waikoloa, Hawaii.
- Gamepolitics.com. (2008a). Cooper Lawrence: "I misspoke" about Mass Effect. Retrieved March 3, 2008 from <http://gamepolitics.com/2008/01/26/cooper-lawrence-i-misspoke-about-mass-effect/>
- Gamepolitics.com. (2008b). GTA IV connection to crime spree came from statements made by one of the suspects. Retrieved July 21, 2008 from <http://www.gamepolitics.com/2008/07/02/police-gta-iv-connection-crime-spre-came-statements-made-one-suspects>

- Gauntlett, D. (1995). *Moving experiences: Understanding television's influences and effects*. Luton, UK: John Libbey.
- Gentile, D., Lynch, P., Linder, J., & Walsh, D. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors and school performance. *Journal of Adolescence*, *27*, 5–22.
- Goldstein, M. J., & Kant, H. S. (1973). *Pornography and sexual deviance: A report of the legal and behavioral institute*. Berkeley, CA: University of California Press.
- Griffiths, M., & Hunt, N. (1995). Computer game playing in adolescence: Prevalence and demographic indicators. *Journal of Community and Applied Social Psychology*, *5*, 189–193.
- Henry, D., & Metropolitan Area Child Study Research Group (2006). Associations between peer nominations, teacher ratings, self-reports, and observations of malicious and disruptive behavior. *Assessment*, *13*, 241–252.
- Kendall, T. (2006, June). Pornography, rape and the internet. Paper presented at the Law and Economics Seminar. Clemson University, Ohio.
- Kirschenbaum, M. (2007). How reading is being reimagined. *The Chronicle of Higher Education*, *54*, 15, B20.
- Kutner, L., & Olson, C. (2008). *Grand theft childhood: The surprising truth about violent video games and what parents can do*. New York: Simon & Schuster.
- Lawrence, R., & Mueller, D. (2003). School shootings and the man-bites-dog criterion for news worthiness. *Youth Violence and Juvenile Justice*, *1*, 330–345.
- McGraw, P. (2007). Virginia Tech massacre: Interview with Larry King Live. Retrieved July 16, 2008 from <http://transcripts.cnn.com/TRANSCRIPTS/0704/16/lkl.01.html>
- Mello, J. (2004). Haitian group files suit to ban Grant Theft Auto: Vice City. *CRMBuyer*. Retrieved July 21, 2008 from <http://www.crbuyer.com/story/ptech/32527.html>
- Metz, B. (2003, May 22). Legislation would target violence in video games. *Boston Globe*. Retrieved July 21, 2008 from [http://www.lionlamb.org/news\\_articles/bostonglobevideogames.html](http://www.lionlamb.org/news_articles/bostonglobevideogames.html)
- Nicholas, S., Kershaw, C., & Walker, A. (2007). *Crime in England and Wales 2006/2007*. London: Home Office.
- Nutter, D., & Kearns, M. (1993). Patterns of exposure to sexually explicit material among sex offenders, child molesters, and controls. *Journal of Sex and Marital Therapy*, *19*, 77–85.
- Olson, C., Kutner, L., Warner, D., Almerigi, J., Baer, L., Nicholi, A., & Beresin, E. (2007). Factors correlated with violent video game use by adolescent boys and girls. *Journal of Adolescent Health*, *41*, 77–83.
- Redding, R. (2001). Sociopolitical diversity in psychology: The case for pluralism. *American Psychologist*, *56*, 205–215.
- Reddy, M., Borum, R., Berglund, J., Vossekui, B., Fein, R., & Modzeleski, W. (2001). Evaluating risk for targeted violence in schools: Comparing risk assessment, threat assessment and other approaches. *Psychology in the Schools*, *38*, 157–172.
- Ritter, D., & Eslea, M. (2005). Hot sauce, toy guns and graffiti: A critical account of current laboratory aggression paradigms. *Aggressive Behavior*, *31*, 407–419.
- Savage, J. (2008). The effects of media violence exposure on criminal aggression: A meta-analysis. *Criminal Justice and Behavior*, *35*, 1123–1136.
- Sewell, K. W., & Mendelsohn, M. (2000). Profiling potentially violent youth: Statistical and conceptual problems. *Children's Services: Social Policy, Research, and Practice*, *3*, 147–169.
- Sherry, J. (2007). Violent video games and aggression: Why can't we find links? In R. Preiss, B. Gayle, N. Burrell, M. Allen, & J. Bryant (Eds.), *Mass media effects research: Advances through meta-analysis* (pp. 231–248). Mahwah, NJ: L. Erlbaum.
- Sikes, P. (2008). At the eye of the storm: An academic's experience of moral panic. *Qualitative Inquiry*, *14*, 235–253.
- Sternheimer, K. (2007). Do video games kill? *Contexts*, *6*, 13–17.
- Surette, R. (2006). *Media, crime and criminal justice: Images, realities and policies*. Belmont, CA: Wadsworth.
- The Lancet. (2008). Is exposure to media violence a public health risk? *The Lancet*, *371*, 1137.
- Thompson, J. (2007). *Massacre at Virginia Tech: Interview with MSNBC*. Retrieved July 16, 2008 from <http://www.msnbc.msn.com/id/18220228/>
- Trend, D. (2007). *The myth of media violence: A critical introduction*. Malden, MA: Blackwell.

- Turner, E., Matthews, A., Linardatos, E., Tell, R., & Rosenthal, R. (2008). Selective publication of antidepressant trials and its influence and apparent efficacy. *New England Journal of Medicine*, 358, 3.
- United States Secret Service and United States Department of Education. (2002). *The final report and findings of the Safe School Initiative: Implications for the prevention of school attacks in the United States*. Retrieved November 12, 2007 from [http://www.secretservice.gov/ntac/ssi\\_final\\_report.pdf](http://www.secretservice.gov/ntac/ssi_final_report.pdf)
- Unsworth, G., Devilly, G., & Ward, T. (2007). The effect of playing violent videogames on adolescents: Should parents be quaking in their boots? *Psychology, Crime and Law*, 13, 383–394.
- Virginia Tech Review Panel. (2007). Report of the Virginia Tech Review Panel. Retrieved November 11, 2007 from <http://www.governor.virginia.gov/TempContent/techPanelReport.cfm>
- Waldron, D. (2005). Role playing games and the Christian Right: Community formation in response to a moral panic. *Journal of Religion and Popular Culture*, 9. Retrieved July 17, 2008 from <http://www.usask.ca/relst/jrpc/art9-roleplaying-print.html>
- Walker, C. E. (1970). Erotic stimuli and the aggressive sexual offender. Technical report volume 7 (pp. 91–147): US Commission on Obscenity and Pornography.
- Williams, D., & Skoric, M. (2005). Internet fantasy violence: A test of aggression in an online game. *Communication Monographs*, 72, 217–233.
- van Dijk, J., van Kesteren, J., & Smit, P. (2007). *Criminal victimization in international perspective*. The Hague: United Nations Office on Drug and Crime.