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Violence Video Games DO Contribute to Aggression

By Erica Scharrer, Gichuhi Kamau, Stephen Warren, and Congcong Zhang

Abstract

In this chapter, we provide a brief review of the research investigating the connection between playing violent video games and aggression, summarizing key approaches and findings from survey research and experimental methodology. We trace through some of the main features of the debate surrounding the topic, present the grounds on which we arrive at our own interpretive position, and make some suggestions for future research. We find that effects are often contingent on (or made stronger or weaker by) features of games themselves and how they are played as well as differences that different users bring to the gaming experience. On balance, we make a case for the interpretation that playing violent video games does, indeed, contribute a small but meaningful influence on aggression.

Throughout history, concern about the effects of exposure to violence in the media has circulated with the introduction and widespread adoption of many forms of media technology, including film, television, and the Internet. When each of these media types has found its way to the daily lives of the public, their use has triggered expressions of concern about the violent images and actions found within their content. Video games seem to have spurred particularly anxious commentary and critique, likely attributable in large part to their interactive nature, technology that immerses the player in the action, and the notoriety of some of their most popular titles. With games in the Call of Duty and Grand Theft Auto franchises capturing headlines for both popularity and record-breaking sales (Macy, 2017; Minoti, 2017) and for their inclusion of violent images and simulations (Olsen, 2012; Saar, 2014), the potential for violence in video games to have an adverse influence has captured the popular imagination.

Scholars, too, have been posing research questions and testing hypotheses pertaining to the potential influence of violence in video games on players young and old for quite some time. Using the main techniques of surveys and experiments—as well as exploring some key variations within—the social scientist is able to examine both the long-term, cumulative ways in which time spent gaming with violent genres and titles might relate to one's level of aggression as well as the short-term, immediate impact of such gaming. Our topic has generated a rather vehement debate within the scholarly community, with researchers battling it out in published commentaries and other forums on the merits of the studies and on the ways in which those studies have been framed, discussed, and represented. We will trace through some of the most pertinent points of departure among researchers that help fuel the debate surrounding the issue. We divide our discussion of the existing research by major method employed—experiments and

surveys—to look for correspondence and divergence in approach and findings within similar types of studies.

The distinction between the term “aggression” and the term “violence” is an important starting place. Most social scientists conceive of aggression as the more general, umbrella term and violence as a narrower subset of actions underneath (Baron & Richardson, 1994). Psychologists and other social scientists generally use the term aggression to signify anything one human might do to intentionally inflict harm on another (Kirsh, 2012). Aggression can have physical (harming with the body or with weapons), verbal (harming with words), and even indirect (harming someone without them having to be present) components (Kirsh, 2012). When aggression takes a physical form, the act can range from causing decidedly illegal and decisively severe (like shooting, stabbing, or engaging in sexual violence) to relatively more minor harm (like children shoving each other on the playground or even acts against objects like slamming a door in anger). Violence is typically confined in its use by scholars in our field of study to more severe acts of physical forms of aggression, acts at the overtly and seriously harmful end of the aggression continuum (Anderson, Berkowitz, Donnerstein, Huesmann, Johnson, Linz, et al., 2003). Using this logic, therefore, not all aggression is violent, but all violence is aggressive. This distinction will prove quite important in our review of the existing research and will factor heavily in the opposing interpretations of the meaningfulness of the existing research evidence.

The evidence from experiments

Lab experiments can illuminate the ways in which individuals respond to games of varying types. Yet, the experimenter has to contend with threats to validity in the conditions created by the experiment, including the ways in which aggression is measured. The researcher also has to make sure conditions are equivalent on as many factors as possible besides the

amount of violence in the game. Ethical considerations are also exceptionally important. Fundamentally, the researcher would not want to trigger an expression of violence among research participants and therefore has to confine herself to outcome measures generally characterized as aggression rather than violence.

How to measure aggression ethically as well as validly and reliably is perhaps the most difficult challenge that social scientists studying video game violence effects face. Employing an indirect measure of aggression, for example, Giumetti and Markey (2007) first measured dispositional anger (how much a person tends to feel anger and emotional arousal day to day) among participants (167 college students) and then randomly assigned them to play one of three violent games or one of three non-violent games on the Xbox for 15 minutes. Participants were presented with three story stems, describing scenarios in which individuals found themselves in vexing situations. The researchers asked the participants to list 20 things that individual might do, say, or feel, and measured those responses for the presence of aggression. Those who had played the violent games wrote down significantly more aggressive thoughts, feelings, and actions for the character in the story stem compared to those who played the non-violent games.

In an additional example of an indirect measure, McGloin and colleagues (McGloin, Farrar, Krcmar, Park, & Fisklock, 2016) randomly assigned 488 participants (again, college students) to play the game Time Crisis 4 (a first person shooter) with a traditional button and joystick controller or with a gun controller for 10 minutes on the PlayStation 3. The measure of aggression was an adaptation of the Buss-Perry self-report questionnaire that was revised to measure participants' state aggression (their current levels, as expressed by intentions to use verbal or physical aggression) rather than their trait aggression (their general willingness to use aggression on a daily basis). In the results, the researchers found two paths to increased

aggression. The effect of playing with a gun controller was associated with participants' perceptions of the naturalness of the controller, which, in turn, predicted realism, which, again in turn, predicted enjoyment, which, finally, predicted increased reports of state aggression. The effect of playing with a gun controller again predicted perceptions of naturalness in the second path, but then in-game failure (number of times the player was killed and had to press continue) predicted frustration which led to higher reports of state aggression, as well. More and less skilled players, therefore, had different paths to state aggression, yet in each the naturalness of the controller (using a gun to simulate the first person shooting) seemed to make a difference.

When researchers employ direct, physical expressions of aggression in a laboratory setting, they must do so in a manner that does not cause serious harm to research participants. Examples of such measures used in studies of the effects of video games include administering unpleasant tastes or sounds to individuals. A recent study conducted by Arriaga and colleagues (Arriaga, Adrião, Madeira, Cavaleiro, Maia e Silva, et al., 2015) provides a good example and a complex research design. In their study, participants played either Time Crisis 4 or Need for Speed (two games rated similarly by participants for enjoyment, difficulty, and frustration but rated quite differently for violence), and then were shown pictures of victims of violence, during which eye tracking technology measured their pupil dilation. Next, participants participated in a competitive reaction time test in which they and a competitive partner were each trying to achieve the fastest reaction time. The competitive partner was actually a programmed computer, but the participants believed they were issuing unpleasant and loud blasts of noise to a person against whom they were competing. Those who played the violent game had lower pupillary dilation responses to victims shown in distress or injury (an indication of desensitization)

compared to those who played the non-violent game. Those low pupil dilation responses, in turn, predicted increased use of the noise blasts, the behavioral aggression measure used in the study.

Zumbach, Seitz, and Bluemke (2015) employed a unique design using an implicit association task to measure the association between the self and aggressive words before compared to after playing a violent game, thereby avoiding the limits of self-report. The researchers found a closer association between the self and aggressive words after playing a violent game (Call of Duty: Modern Warfare 2) compared to before playing (whereas a more explicit measure of aggression did not differ from pre- to post-playing). Playing the game in 3D mode with shutter goggles rather than in 2D mode on the PC did not matter for this outcome.

Another key challenge in experimental studies is how to select video games for treatment group and control group members to play that are equivalent in as many factors as possible except for the presence or different types of violence in the game (Adachi & Willoughby, 2011). Anderson and Carnagey (2009) attempted to address the issue of whether competitiveness or violence is the key driving force in links between video game exposure and aggression. They had undergraduate student research participants play either a sports game that contained the typical amount of aggression that one would find in the sport (Madden Football, MVP Baseball 2004) or a version of those same sports games in which aggressive behaviors are exaggerated within the playing options of the game. In MLB Slugfest, players can punch other players, and in NFL Blitz Football, the hits are particularly intense. Those who played the games with the gratuitous violence scored higher on one of four state hostility measures (a measure showing an aggravated state) and on a noise blast competitive reaction test. As we have seen, other approaches used to isolate the impact of violence include measuring whether games played across conditions were

equivalent in enjoyment, difficulty, or other characteristics (as Arriaga et al., 2015 had done) or having a number of violent and non-violent options (as Giumetti and Markey, 2007 had done).

Game content and mode of play are additional factors that the careful researcher must also consider. There is indication in the research that being rewarded by accruing points for aggressive play can stimulate more aggressive thoughts (as measured by a word completion task; completing the beginning of ki__ as kill, for instance) and actions (again, using the competitive reaction time test) compared to being punished for the same acts by losing points (Carnagey & Bushman, 2005). Realism of the game's content may play a role, as well. Barlett and Rodeheffer (2009) found that those who played a game based on a plausible and even historical premise (Conflict Desert Storm) experienced more aggressive feelings (as measured by the self-report state hostility scale) than those who played a violent game with a fantasy theme (Star Wars Battlefront 2). For aggressive cognitions (the word completion task), playing either of the games with violence led to higher scores compared to the control group. Recent research also suggests that playing a violent game competitively rather than cooperatively with others helps determine aggressive response (Velez, Greitemeyer, Whitaker, Ewoldsen, & Bushman, 2015).

Age is an important factor to consider, as well. Konijn, Bijvank, and Bushman (2007) found that among adolescent boys, wishful identification with the game character (an expressed desire to be like the character) interacted with playing a violent game to predict aggression as measured by the competitive reaction time test and corresponding noise blasts. Saleem, Anderson, and Gentile (2012) assigned young people aged 9 to 14 to play E-rated games with and without violence, and assessed outcomes by asking participants to assign puzzles for an ostensible competitive game partner to solve. They found that playing the more violent games

led to more hindering behavior (i.e., assigning the opponent more difficult puzzles), whereas playing the prosocial games led to more helping behavior (i.e., assigning easier puzzles).

The evidence from surveys

Cross-sectional studies conducted in the United States have gathered data from undergraduate students and adults outside the university setting. In Fox and Potocki (2015), for instance, respondents estimated frequency of exposure to violent video games during childhood, adolescence, and adulthood. That measure was found to predict more favorable attitudes toward interpersonal aggression, which, in turn, predicted both hostile sexism and rape myth acceptance. Tang and Fox (2016) determined that number of hours of online gameplay, game involvement, and hostile sexism each predicted male players' use of generalized or sexualized harassment of other players during online game play. Ivory, Ivory and Lanier (2017) surveyed 533 college students from across the U.S. Most central to our topic, they found amount of weekly video gaming predicted participants' reports of the number of times they had carried a weapon in the past year, the number of times they had gotten into a physical fight, and the number of times those fights required someone seeking medical attention. Amount of time spent with action games, in particular, a genre in which violence is typically quite central, also predicted carrying a weapon and getting into fights requiring medical attention.

Cross-sectional surveys have gathered data from children and/or adolescents from various locations around the globe (e.g., Brändle, Cardaba, & Rivera, 2015; Breuer, Festl, & Quandt, 2014; Dittrick et al., 2013; Gentile, Lynch, Linder, & Walsh, 2004; Lam, Cheng, & Liu, 2013; Möller & Krahé, 2009; Rudaksikira, Muula, & Siziya, 2008; You, Kim, & No, 2015). Lam and colleagues (2013), for instance, found that among adolescents from two cities in Northeast China, moderate to high levels of violent video game exposure predicted reporting being a

perpetrator as well as being concurrently a perpetrator and a victim of cyberbullying. Similarly, in Canada, Dittrick and colleagues (2013) found those 10- to 17-year-olds whose three favorite games contained violence were more likely to report bullying peers both on- and offline. In the United States, Rudatsikira, Muula, and Siziya (2008) found, in a large national sample of youth, that playing video games for three hours or more daily was one of several significant predictors of reporting having engaged in a physical fight on school property in the 12 months prior to the survey. In Germany, Festl, Scharkow, and Quandt (2013) found higher scores on the Game Addiction Scale were associated with self-reports of physical aggression and anger among a large sample of respondents aged 14 and older.

Of course, correlation is not causation, and the prime concern with the cross-sectional approach is that researchers cannot rule out the reverse explanation, that observed links between aggression and violent gaming are explained by those high in aggressiveness seeking out violent games rather than the game causing their aggression. Longitudinal studies measure respondents over multiple points in time, and are therefore able to establish the sequence necessary for a causal interpretation, with violent gaming preceding and predicting aggression rather than (or perhaps in addition to) aggression preceding and predicting violent gaming. Möller and Krahé (2009) used cross-lagged path analysis and found a significant relationship between violent video game use at time 1 and physical aggression at time 2. Slater and colleagues (2003) studied data from over 2,500 children in grades 6 and 7 for two years. Results pointed to a “downward spiral” of mutually reinforcing associations between violent media use (which included Internet, TV, and video and computer games) and aggressive thoughts, values, and behavior. Aggression of the young person predicted the selection of violent media consistently throughout the periods of data collection, whereas violent media use predicted the youth’s aggression increasingly over

time. Research by Fikkers, Piotrowski, Weeda, Vassen, and Valkenburg (2013) using longitudinal data from 499 10- to 14-year-olds in the Netherlands showed exposure to conflict within the family interacted with exposure to television and video game violence to predict increases in aggression over time. The aggression measure used in the study included name calling, pushing, hitting or kicking, purposely tripping, threatening to beat up, or fighting. Finally, Willoughby, Adachi, and Good (2012) surveyed 1,492 adolescents over the course of 9th through 12th grade. The dependent variable they used was self-reports of both typical aggressive behavioral patterns and specific aggressive behaviors enacted over the past year. More violent video game play predicted higher scores on these measures, even after controlling for prior levels of aggression. Non-violent video game use did not predict change in aggression, and prior aggression generally did not predict greater violent video game use.

In surveys investigating a form of aggression likely to qualify as violence due to the severity of harm measured, the evidence for a meaningful connection between violent gaming and these behaviors is less consistent. In a large longitudinal sample of school-going youth, Ybarra, Huesmann, Korchmaros, and Reisner (2014) determined that violent video gaming was associated concurrently with carrying a weapon to school. Exelmans, Custers, and Van den Bulck (2015) found that among over 3,000 Flemish 12- to 18-year-olds, violent video game exposure predicted reports of delinquent behaviors (an index in which the most common behavior was attacking someone with the intent of hurting them), even when accounting for a number of additional risk factors. Yet, other studies have found reduced or even unsupported associations between video game use and serious violence (Savage, 2004). Using the same data set from over 6,000 eighth graders in Delaware, for example, both Gunter and Daly (2012) and DeCamp (2015) demonstrated that when young people who played video games were matched

with young people who did not on a long list of factors, the differences between the groups on serious aggressive outcomes were small or non-significant. In the DeCamp study, for girls only, gaming contributed a small but significant amount of variance to hitting someone with the intention to hurt them and carrying a gun to school, but the size of the association was much smaller than the risk factors of witnessing violence at home and having high levels of sensation seeking. Ferguson, San Miguel, Garza and Jerbeck (2012) found no connection between violent video game use and scores on a scale that measured youth and parent reports of serious aggression or dating violence in a longitudinal study of 165 mostly Latino youth.

Sources of debate

In assessing the divide between those that contend violent video games contribute meaningfully and importantly to aggression and those that dispute this claim, two overarching themes are evident, those pertaining to methodological approaches and those having to do with interpretation. In the former category, Elson and Ferguson (2014) argue that laboratory experiments tend to utilize trivial measures that lack reliability and external validity. As one of the most frequently employed outcome measures, the competitive reaction time task has been criticized for lacking validation and standardization (Ferguson, Smith, Miller-Stratton, Fritz, & Heinrich, 2008; Savage, 2004). The “hot sauce measure” has been similarly criticized (Elson & Ferguson, 2014; Ferguson & Rueda, 2009). Researchers that use the CRTT state that while multiple measures may be reported in different studies they yield similar results (Bushman, Rothstein, & Anderson, 2010). Further, evidence of high external validity is reported, as variables known to influence real world aggression and violence have been shown to have the same effects on laboratory measures of aggression (Anderson & Bushman, 1997).

For survey research, Elson and Ferguson (2014) suggest that correlational studies have failed in reporting significant and conclusive results linking video game violence to aggression and that they are not effective in controlling for outside risk factors. On the opposing end, others make the point that correlational studies attempt to rule out alternative explanations through use of statistical controls (Anderson, 2003). They state that unlike experimental methods, correlational research ethically allows for the study of more serious and severe acts of aggression. Further, these researchers have argued that the average effect sizes for experimental studies and correlational studies are comparable (Anderson & Bushman, 2001).

The role that meta-analyses play has continually been put to task by some, while adamantly defended by others. Some researchers argue that mean effect sizes estimated across multiple studies are potentially inflated to cover for weak methodology and unstandardized measures, as well as publication bias (the tendency for research supporting a hypothesized link between media violence and aggression to be more likely to be published than research not finding such a link; Ferguson & Kilburn, 2009). In contrast, Bushman and Huesmann (2014), argue that effect sizes may be underestimates, since in research one is unable to expose participants to age-inappropriate video games, which does occur in the real world. Also, during experiments participants are exposed to violent video games for a significantly shorter (15-30 minutes) period of time than is typically reported in real-world play.

A fundamental area of disagreement among researchers focuses on the models and theories used to assess aggression. The General Aggression Model (GAM) is based on social cognitive theories and puts forth that repeated use of violent media results in increased aggression over time (Anderson & Bushman, 2002). Opponents argue that the GAM relies heavily on social learning and assumes a passiveness on the part of video game users while

disregarding the role of biological factors (Ferguson & Dyck, 2012). In contrast to the GAM, the Catalyst Model as proposed by Ferguson, Rueda, et al. (2008), focuses primarily on how genetic factors and societal attributes, such as physical environment and family and peer interaction, influence aggression. Another argument suggests effects of violent gaming are confined to those with a predisposition to aggression (Ferguson, Ivory & Beaver, 2013), whereas critics of this position state that research has not consistently substantiated the claim that certain populations are more susceptible (Bushman & Huesmann, 2014).

Opponents of the aggression claim have stated that in published studies the reported effect sizes are trivially small and inconclusive. Further, they posit that if there is a significant relationship, the increase in popularity of these games should result in an increase in violent crime rates in the U.S. while the inverse is the case (Ferguson, 2010). Those in support have argued that, in fact, studies have linked high levels of violent video game exposure to delinquency, bullying, hitting, and other acts of aggressive behavior (Anderson, 2003). In critique of the logic that an increase in violent crime rates should be observed, proponents have been careful to note that other contributing factors to societal violence may have greater influence, arguing that while violent video games may not be the primary factor, they cannot be ignored entirely (Anderson & Bushman, 2002). As demonstrated by the research on other health risks, in certain cases small effects sizes can be cause for concern when occurring over time or when a large population is exposed (Bushman & Huesmann, 2014).

In relation to how findings are reported and presented, Ferguson (2015) argues that researchers that support the claim of a link between violent video games and aggression often ignore research that differs from their stance on the issue. Further, the claim for publication bias in psychological science is made with the argument that positive results get published in

professional journals while negative findings often go unpublished. Yet, Anderson (2003) suggests researchers often cite studies more closely related to their own work especially given page limits in journals. Therefore, when reporting significance and formulating a discussion around positive results similar literature is likely to be discussed. Lishner, Groves, and Chrobak (2015) state that a review of the research demonstrates that publisher bias is not a valid concern as reported effect sizes are similar and health and behavioral science peer-reviewed journals have published work on both sides of the argument.

Assembling the evidence to form conclusions and moving forward

In this chapter, we have presented a select number of studies (limited by the pages permitted in the book) that exemplify some of the ways that social scientists have attempted to answer the important question of whether violent video games contribute meaningfully to aggression. We have seen that studies are complex and often show effects that are not universal but often are contingent upon features of the game or the gaming experience or factors pertaining to the individual players themselves. Nonetheless, they do, indeed, demonstrate effects.

Of course, every one of the studies that we have reviewed—and, indeed, every conceivable study—has limitations. Surveys are more natural and can produce valid self-reports under conditions of anonymity but even under multiple controls they fall short of unequivocally establishing a causal relationship. Experiments can measure short-term and delayed post-test causal effects, but they are inherently artificial and they require the researcher to use oblique measures of aggression that may or may not map on to real-world actions. So, how can we then take the position that violent video games do contribute meaningfully to aggression?

We do so by looking across the individual studies to the research literature as a whole. In doing so, we find that most data that are available on the topic do point to a connection between playing violent games and some form of aggression. Together, the body of evidence, we argue, is sufficiently convincing to warrant the position we are taking in this chapter. We believe the limitations of each major method or single study when weighed against the strengths of the other method and body of knowledge as a whole in the published research thus far allow for this conclusion. We are not alone in this interpretation. The American Psychological Association recently assigned a task force of scholars to do an independent assessment of the state of the knowledge in this field. The taskforce determined, "The research demonstrates a consistent relation between violent video game use and increases in aggressive behavior, aggressive cognitions, and aggressive affect and decreases in prosocial behavior, empathy, and sensitivity to aggression" (APA Task Force on Violent Media, 2015).

To make our claim about the state of the research as a whole we rely, as well, on meta-analyses. Meta analyses amass as many existing studies as the researcher can find on a shared topic and determine statistically what the collected studies find. The most recent meta analyses on video game violence and aggression (Anderson et al., 2010; Ferguson & Kilburn, 2010; Greitemeyer & Mügge, 2014) encompass 27 to 381 individual tests of the relationship between violent video game use and aggression, covering 12,000 to 130,000 participants. The effect sizes they estimate between violent gaming and aggressive behavior are quite similar: .14 for the Ferguson and Kilburn (2010) meta analysis, and .19 for the other two. The Anderson and colleagues (2010) and the Greitemeyer and Mügge (2014) meta analysis also estimate effect sizes of about the same magnitude or larger for the outcomes of aggressive thoughts and feelings. Although the effects sizes are not large, we join the members of the APA Task Force on Violent

Media in interpreting them as establishing a small but significant (both statistically and colloquially) contribution of use of violent video games to aggression.

Yet, others look at the same effect sizes and interpret them as inconsequential (Ferguson & Kilburn, 2009). As the debate currently stands, a consensus among researchers on questions concerning the link between violent video games and aggression appears somewhat distant. Perhaps one potential way to bring the two sides a bit closer together is to distinguish between acts of aggression at the more compared to the less severe end of the spectrum. Our own reading of the existing research is that the more severe end of the spectrum is the primary area in which research findings diverge and/or when effects sizes are diminished. We would argue that this makes intuitive sense, in that acting violently in a manner that goes entirely against societal norms, legal codes, and moral considerations is a rare and complex phenomenon likely driven by serious real-world experiences. A survey found that just 35% of scholars believe media violence can be linked to severe acts of real-world violence, yet a considerably larger 57% believe there is sufficient evidence to support the argument that violent media may lead to less extreme acts of aggression (Bushman, Gollwitzer, & Cruz, 2015).

Of course, even if all those involved in the scholarly debate agree that the size of the contribution of violent video gaming is larger for less compared to more severe forms of aggression, they are likely to still disagree about whether the impact of violent games on less severe forms is cause for concern. We would argue that it is, indeed, the case. The less severe forms of aggression identified in the studies we have reviewed and others would still represent harsh and quite unpleasant experiences for the parties involved. If we could make those experiences less likely, we would reduce important stressful conditions and conflicts among individuals. And unlike more intractable causes of aggression including poverty, systemic

inequalities, and other cultural conditions, limiting or speaking up about violence in video gaming is a preventative approach relatively easy to achieve.

Another “best practice” that perhaps all scholars could observe in moving forward is using more precise language about the outcome measures used to study aggression. In this chapter, we have tried to be quite careful in including detail about how aggressive thoughts, feelings, and behaviors are measured, and have attempted to model the use of descriptions of the actual measures themselves in interpreting outcomes in place of broader claims. We also believe additional studies are needed to sufficiently address whether and how age, gender, and other demographic and individual differences matter in the ways that individuals respond to violent video games. Overall, we hope researchers remain open and transparent in their studies on this topic, not over or understating their results and interpretations, as the overall goal remains to advance knowledge and inform society using scientifically supported findings.

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