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CHAPTER 12

Violent Video Games: The Effects on Youth, and Public Policy Implications

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Years of research documents how witnessing violence and aggression leads to a range of negative outcomes for children. These outcomes result both from witnessing real violence (Osofsky, 1995) as well as from viewing media violence (Anderson et al., 2003; Gentile, 2003). Ironically, the same parents who take great pains to keep children from witnessing violence in the home and neighborhood often do little to keep them from viewing large quantities of violence on television, in movies, and in video games.

The apparent lack of parental concern about media violence is particularly perplexing given the clear research on the negative effects of such violence and the strong critique of such violence by pediatricians. The most recent comprehensive review of the literature on media violence effects—coauthored by eight leading media violence researchers—documents the “unequivocal evidence that media violence increases the

likelihood of aggressive and violent behavior in both immediate and long-term contexts” (Anderson et al., 2003, p. 81). In a 2004 survey of pediatricians, over 98% believe that the media affect childhood aggression (Gentile et al., 2004). Somehow, this message has failed to be delivered successfully to the average American parent.

Although there is a large and impressive body of research on the effects of violent television and film on aggressive behavior, there is less research on the effects of violent video games on aggressive behavior. The research that does exist, however, suggests an equally strong connection to negative effects on children. The importance of this research to parents is as critical as the work on television and film. This chapter will review the available research on video games, including the history of violence in video games and the research on the effects of playing violent video games. The chapter will also discuss the political and public policy implications of this research.

THE HISTORY OF VIOLENCE IN VIDEO GAMES

The first commercial video game, *Pong*, was released in 1972. It was like a game of table tennis (or *ping pong*), in which players had to hit a “ball” with “paddles.” As the commercial possibilities became known, game developers began to push the creative and technological envelopes in order to gain greater profits and market share. The developers not only worked to create better technological capacities and graphics abilities, but also experimented with content to see what the market would bear, including violent content.

We, like many other researchers, define *aggression* as behavior (verbal or physical) that (a) is intended to harm another individual; (b) is expected by the perpetrator to have some chance of actually harming that individual; and (c) is believed by the perpetrator to be something that the target individual wishes to avoid. In recent years, there has been a convergence of opinion among psychological scholars that physical aggression should be conceived as existing along a severity continuum ranging from mild (e.g., a weak slap) to severe (e.g., shooting), and that violence (or violent behavior) refers to physical aggression toward the severe end of this continuum (e.g., Anderson et al., 2003; Anderson & Huesmann, 2003). In other words, *violence* is simply physical aggression at the high end of a severity dimension. These definitions can be applied both to the violence shown in video games as well as to the types of aggressive behaviors that playing such games might influence.

The first violent commercial video game to receive much attention was *Death Race*, a driving simulator. Released in 1976, the game’s working title had been *Pedestrian*. The goal was to run down stick-figure pedestrians, called “gremlins,” who would then scream and turn into gravestones. The violent

content of this game spurred a public outcry, causing some communities to ban it. The controversy actually increased sales of the game about tenfold (Kent, 2001). This market outcome was not lost on game developers. Although many game developers created standards for their games, including “No excessive blood and violence” and “No sex” (Kent, 2001, p. 465), it gradually became clear that games sold better if they contained more violence, at least in part because of the free publicity generated by outcries against the violence. In the late 1980s and early 1990s, one-on-one fighting games such as *Double Dragon* and *Mortal Kombat* pushed the boundaries of violence and became all-time best sellers. The economic benefits of more explicit violence became apparent when Nintendo and Sega both created versions of *Mortal Kombat* for their competing systems. Nintendo had toned down the blood and gore in their version, and the Sega Genesis version outsold Nintendo’s version three to one (Kent, 2001). (The games mentioned in this chapter are described in Appendix A.)

During the 1980s and early 1990s, the violence in video games was still fairly stylized, in large part because of technological constraints. In 1992, a major step forward in realism was taken by the game *Wolfenstein 3D*, the first major “first-person shooter” game. In this kind of game, one “sees” the video game world through the eyes of the character one controls, rather than seeing it from afar, as in almost all previous fighting games. The player moves around, exploring a three-dimensional environment, and can shoot at various game characters. The effect is to put the player *in the game*, fighting, killing, and being killed. This additional realism was followed by other realistic touches. Video game historian Steven Kent (2001) has noted that, “part of *Wolfenstein*’s popularity sprang from its shock value. In previous games, when players shot enemies, the injured targets fell and disappeared. In

Wolfenstein 3D, enemies fell and bled on the floor" (p. 458). This caused a revolution in the way violent games were designed. In 1993, *Doom*, the next major first-person shooter game was released. It included more blood and gore and also allowed players to hunt and kill each other.

Partially in response to these advances in video game violence, Senators Joseph Lieberman (D-CT) and Herbert Kohl (D-WI) initiated Congressional hearings to examine the marketing of violent games. The hearings examined whether games with what seemed to be the equivalent of the content in R-rated movies (e.g., violence and sexuality) were being sold to children (Kent, 2001). The hearings included testimony from media effects researchers, child advocates, and video game industry executives. Although there was far less research on the effects of violent video games then than now, the combined pressure caused the video game industry to create its own trade organization (the Interactive Digital Software Association, now renamed the Entertainment Software Association), as well as an organization to create and provide ratings for video games (the Entertainment Software Ratings Board [ESRB]). Thus, the hearings resulted in the video game industry agreeing to implement a voluntary ratings system. Senator Lieberman had hoped that this would cause the video game industry to reduce the violent content of their games, by making them pay attention to the potential effects of the games (Kent, 1997). However, the adoption of ratings did not have this effect, and by 1997 Senator Lieberman admitted that, "The rating system has not stopped game producers from putting out some very violent games" (Kent, 1997). In fact, it had the same effect that the movie ratings system had had on films—now that there were ratings, producers felt able to make even more violent games because they did not need to be designed for general audiences. Thus, when *Mortal Kombat 2* was

released, the Nintendo version had just as much gore as the Sega version, and this time the Nintendo version sold better than Sega's (Kent, 2001).

The technological advances in computing and graphics power have continued to increase at a geometric rate during the past decade, allowing the graphics and gameplay to become more violent and more realistic. For example, the first-person shooter game *Soldier of Fortune* (SOF) was created in collaboration with an ex-army colonel, and it featured 26 different "killing zones" in the body. The characters in the game respond realistically to different shots depending on where in the body they are shot, with what weapons, and from what distance. Shooting a character in the arm at close range with a shotgun rips the arm from the socket leaving exposed bone and sinew while blood rushes from the wound. In 2004, the violent game *Doom* got an update, and in the words of one reviewer, "the illusion the game creates is so realistic.... There is a crispness to details, a weight and solidity to objects and figures, a lifelike sheen to surfaces in *Doom 3* that is unlike anything we've seen before" (Grossman, 2004, p. 83).

As the violence in video games has increased, the concern about the potential effects of playing these games has also increased. One benefit of this concern has been a corresponding increase in empirical research on the effects of video games on players.

RESEARCH ON THE EFFECTS OF VIDEO GAMES

Researchers require that theories be created, tested, and revised based on the results of the tests. The revisions are further tested and revised, ultimately resulting in a theory that has solid theoretical and empirical bases. Several theories have received empirical

support and explain why playing violent video games might increase aggressive behaviors. These theories range from specific theories of learning (e.g., Gentile & Gentile, under review) to broad psychological theories of aggression (e.g., the General Aggression Model; see Anderson & Bushman, 2002; Anderson, Gentile, & Buckley, in press; Anderson & Huesmann, 2003).

There are several types of research designs that social scientists can use, and each type allows different sorts of conclusions to be drawn. No single study can ever be called “conclusive,” a point that the video game industry has continued to exploit semantically: Recently, in response to California Bill 1793, which would require that stores make signs and brochures to explain the video game ratings to customers, the president of the Interactive Entertainment Merchants’ Association stated, “To-date there has been no conclusive research to prove a causal linkage between playing videogames and asocial behavior” (Halpin, 2004). To accept this statement, one must misunderstand how behavioral science is conducted. Because no one study can ever be wholly conclusive, researchers create and test theories, conducting several studies, each of which has different strengths. It is the total picture of combined studies that answers the question of a causal link.

The three major types of studies—experimental, correlational, and longitudinal—have different strengths and weaknesses. Experimental studies randomly assign participants to different groups—for example, to play either a violent or nonviolent video game. All other factors are carefully controlled, so that the two groups should differ only on the type of game played. After playing, the experimenter might measure aggressive thoughts or aggressive behaviors for both groups. If the groups differ in their responses, causality *can be inferred*, because the game played was the only apparent way in which the groups differed (because

participants are randomly assigned to different groups, any individual differences should be equally distributed between the groups). The ability to determine causality is the great strength of experimental studies. Their major weakness in this context is that it is usually impossible to use strong “real-world” measures of aggressive behavior. It would be unethical to actually allow study participants to hit each other, for example, so more ethical measures must be used. The researcher must then prove that the laboratory measures of aggression predict real-world types of aggression.

Correlational studies allow researchers to get beyond this limitation of experimental studies. In a correlational study, for example, researchers might survey children about the video games they play, and about several real-world types of aggressive behavior, such as how many physical fights they get into. The major weakness of correlational studies is that *causality cannot be proven* by them, at least, not in a single correlational study. It might be that playing violent games causes aggressive behavior, or that aggressive children play violent games, or some third variable that causes both (such as being male, which predicts both aggressive behavior and interest in violent video games). Correlational studies are strong where experimental studies are weak and vice versa. Therefore if both types of studies show similar results, we can start to be reasonably comfortable that we have discovered a real effect.

A third type of study, longitudinal studies, can document changes over a longer period of time. In a longitudinal study, for example, one might measure children’s video game play and aggressive behavior at two points in time. In this way, one can test whether children who play violent games at the beginning of the study *change* to become more aggressive by the end of the study. The major limitation of longitudinal studies is that they are difficult and expensive to conduct.

Before scientists are willing to believe that playing violent video games predicts aggressive behavior, they would want to see studies of each type performed, and determine whether the results of the different studies converged. A strong case for a real effect arises if the same results are found no matter what way one studies it. Furthermore, behavioral scientists would want to see that the studies had controlled for several other variables that might be related to both video game play and aggression, such as sex, personality trait hostility, parental education level, parental monitoring of media, and so forth. Although more research is needed, all of these types of studies have been conducted with similar results: playing violent video games can indeed cause increases in aggressive thoughts, feelings, and behaviors.

These same methods have also been used to document potentially *positive* effects of certain types of video games. Video games have been successful at imparting the attitudes, skills, and behaviors that they were designed to teach (Lieberman, 1997, 2001). For instance, they can teach children healthy skills for the self-care of asthma and diabetes (Lieberman, 1997, 2001). In a study of college students, playing a golf video game improved students' actual control of force when putting, even though the video game gave no physical feedback on students' actual putting movement or force (Fery & Ponserre, 2001). Correlational studies with adults show that experience with video games is related to better surgical skills (e.g., Rosser et al., 2004; Tsai & Heinrichs, 1994). Research also suggests that people can learn iconic, spatial, and visual attention skills from video games (De Lisi & Wolford, 2002; Dorval & Pepin, 1986; Green & Bavelier, 2003; Greenfield, deWinstanley, Kilpatrick, & Kaye, 1994; Griffith, Volschin, Gibb, & Bailey, 1983; Okagaki, & Frensch, 1994). Finally, research on educational software has shown that

educational video games can have very significant effects on improving student achievement (Murphy, Penuel, Means, Korbak, & Whaley, 2001). In sum, video games are great teachers, but what they teach very much depends on the content (Buckley & Anderson, *in press*; Gentile & Gentile, *in press*). Therefore, we do not consider video games "bad"; rather, we consider them to be powerful teaching tools, and this compels us to study whether violent video games may be powerful teachers of aggressive thoughts, feelings, and behaviors. It is ironic, though not surprising, that even though the studies documenting positive effects as a set are considerably weaker than the studies documenting negative effects of violent games; people seem to want to believe that video games can have positive effects but not that they can have negative effects.

Experimental Studies

Over a dozen experimental studies have been conducted on the short-term effects of playing violent video games (e.g., Ballard & Weist, 1996; Calvert & Tan, 1994; Chambers, & Ascione, 1987; Deselms & Altman, 2003). The best experimental studies share at least four common characteristics: sample size of 200 or more; violent and nonviolent games equated on potentially confounding dimensions (e.g., difficulty); violent and non-violent games that are truly violent and nonviolent (respectively); and a clear and valid measure of aggression or aggression-related variables assessed for the game-playing participant. Though these characteristics might seem obvious, a number of experimental studies (published and unpublished) do not have all four. Many have small samples. Some present no evidence that the violent and nonviolent games are equated on difficulty or other potentially confounding dimensions. A few (mostly unpublished) have used games that include violence in the nonviolent condition, or games with relatively little

violence in the violent condition. Still others have used self-reports of past aggression as the dependent variable of aggressive behavior, which is problematic since playing a violent video game for 20 minutes in an experiment would not logically increase aggression committed prior to starting the experiment.

Although the first published experimental study of violent video games appeared in 1985 (Graybill, Kirsch, & Esselman), the first that contained all four of these high-quality characteristics appeared in 2000 (Anderson & Dill, Study 2). In this study, college students were randomly assigned to play either a violent or nonviolent game. The games were matched on several important dimensions, including arousal and frustration levels. Participants played their assigned game and completed measures of aggressive cognition (a word-speed reading task) and of aggressive behavior (a standard competitive game involving the setting of punishment levels for one's opponent). The results were that playing a violent video game increased both aggressive cognition and aggressive behavior.

This pattern of results has also been documented with children and adolescents playing age-appropriate (based on the video game ratings) violent video games (Anderson, Gentile, & Buckley, *in press*; Study 1). E-rated video games (those labeled as appropriate for "Everyone") with violent content increased aggressive behavior in the laboratory, whereas matched nonviolent E-rated games did not. This experimental effect occurred with males and females, with children and older adolescents/young adults, with high and low media violence-exposure individuals, and with high and low media violence-preference individuals. Perhaps surprisingly, among the older adolescents the E-rated violent games produced an increase in aggression at least as large as the T-rated

video games (those labeled as appropriate for "Teens"). Although both types included violent content, the E-rated violent games were rated by players as *less* violent than the T-rated games. Combined, these findings contradict two basic assumptions made by parents, the video game industry, and various public policy groups: (1) that E-rated games (even those with violent content) are safe for all ages; and (2) that T-rated violent games have a significantly bigger immediate negative impact on players than E-rated violent games.

Correlational Studies

Several correlational studies have been conducted on the long-term correlates of playing violent video games, including the relation to real-world physical aggression (e.g., Anderson & Dill, 2000; Dominick, 1984; Gentile, Lynch, Linder, & Walsh, 2004; Krahé & Möller, 2004; Wiegman & Van Schie, 1998). The best correlational studies also share several characteristics: adequate sample size (at least 200); a reliable measure of exposure to violent video games; and a reliable measure of aggression or of an aggression-related variable (e.g., aggressive cognitions). The first published correlational study with all three characteristics appeared in 2000 (Anderson & Dill, Study 1), but the first studies with these methodological characteristics to focus on children did not appear until 2004. Krahé and Möller (2004) found a significant correlation between video game violence exposure and acceptance of physical aggression norms in a sample of eighth graders in Germany ($r = .30, p < .01$). Gentile et al. (2004) reported significant correlations between video game violence exposure and: trait hostility ($r = .21, p < .001$); arguments with teachers ($r = .20, p < .001$); and physical fights ($r = .32, p < .001$). The effect on physical fights of violent video games remained significant even after statistically controlling for sex, trait hostility, and overall amount of video game play. Anderson et al. (2004) replicated many of

these findings with a college student sample, and also provided correlational evidence that aggressive cognitions at least partially mediate the effects of repeated exposure to violent video games on aggressive and violent behavior. In other words, it is not as simple as people just copying what they have seen. Instead, playing violent video games may first increase aggressive and hostile thoughts, and these thoughts in turn increase the odds of behaving aggressively.

In a series of studies with children and adolescents, Anderson et al. (2004, in press) found that video game violence exposure was related to a wide array of aggression (e.g., verbal aggression, moderate physical aggression, violent behaviors). For example, among high school students, the correlation with violent behavior was $r = .35$, and with moderate physical aggression was $r = .46$ (Study 2). Violent video game exposure was also significantly related to a host of aggression-related variables such as trait anger and hostility, attitudes toward violence, and hostile attribution bias. Importantly, video game violence was a significant risk factor for aggression and violence even when other important risk factors were statistically controlled.

Longitudinal Studies

As this chapter goes to press, to our knowledge, only two longitudinal studies of violent video games have been conducted. In the first study, 807 Japanese fifth and sixth graders were surveyed twice during a school year (Ihori, Sakamoto, Kobayashi, & Kimura, 2003). They found that the amount of video game play at Time 1 was significantly (but weakly, $r = .08$) related to later physical aggression, but aggression at Time 1 was not related to later video game play. There are at least two potential problems with this study. First, it relies only on self-report. More importantly, however, the authors only measured the *amount* of video game play,

and not whether the children were playing violent games, a point addressed in more detail later.

In the second longitudinal study, both concerns were addressed. In this study, 430 third, fourth, and fifth graders; their teachers; and their peers were surveyed at two points in the school year (Anderson, Gentile, & Buckley, in press; Study 3). The results showed that students who played more violent video games began to see the world more in terms of aggression (i.e., they had an increase in hostile attribution bias). Research has shown that children who exhibit this cognitive bias (to assume that negative things happen due to hostile intent rather than by accident) are far more likely to react aggressively (Bensley & Eenwyk, 2001; Crick, 1995, 1996; Crick & Dodge, 1994). Indeed, children who had high exposure to violent video games changed over the school year to become more verbally aggressive, more physically aggressive, and less prosocial (as rated by their peers and teachers; raw Pearson correlations ranged between .24 and .40). It appears that not only does repeated exposure to violent video games increase aggressive behavior, but it also decreases empathic helpful behavior. This may be especially noteworthy because increased aggressive behaviors and decreased prosocial behaviors also predicted peer rejection (Anderson et al., in press).

This last finding has particularly important implications because it addresses one of the most common criticisms of the media violence literature. It is often claimed that the correlation between media violence exposure and aggression is due to the fact that aggressive children like to consume media violence, and not because media violence increases children's aggressive thoughts and behaviors. This is a reasonable criticism of correlational research, but it does not explain the findings from experimental research in which both

from experimental research in which both aggressive and nonaggressive children become more aggressive after playing a violent video game. In our view, it does not matter what starts the ball rolling—whether aggressive children watch more violence, or whether watching violence makes children more aggressive. What is clear is that regardless of the *initial cause*, playing violent video games still makes children *more* aggressive. It is certainly plausible that this sets a child on a very bad negative trajectory as the effect snowballs. As children become more aggressive and less prosocial, other children are more likely to reject them from the main peer group. These aggressive children then form a non-mainstream clique with other socially rejected and aggressive children, who then reinforce each other's aggressive attitudes and violent media habits. Ultimately, aggressive children are significantly more likely to have negative outcomes, such as lower academic performance and lower self-esteem (Geen, 2001; National Research Council, 1993), which may perpetuate a cycle of increasingly worse outcomes. Because only one longitudinal study with a measure of *violent* video game exposure has been conducted to date, these conclusions must be considered tentative.

Meta-Analytic Procedures

There is a statistical technique called meta-analysis that is basically a composite of all of the studies, published and unpublished, in a particular area. This statistical technique allows for general conclusions of all the studies done without relying on any single research method or sample population. One recent meta-analysis specifically examined the effects of violent video games effects (Anderson, 2003). The results showed that across all of the studies conducted, video game violence exposure is positively associated with aggressive behavior ($r = .21$,

aggressive affect ($r = .16$), and aggressive cognition ($r = .18$), and negatively associated with helping or prosocial behavior ($r = -.19$).

Early Research Compared to Recent Research

Because video games have changed to include more violence over time, one might predict that early studies looking at the effects of the games might be less consistent in their findings than in later studies. That is, one might expect the difference between the violent and nonviolent games in 1985 to have been a much smaller difference than exists today, and therefore should have a correspondingly smaller and harder-to-detect effect. In fact, this is exactly the pattern researchers have found. In experimental studies where the difference in amount of violent content can be quantified, studies with larger differences between the violent and nonviolent games show larger affects on aggressive behavior (Gentile & Anderson, 2003). In correlational studies, where it is much harder to quantify differences between games, an analysis of the year the studies were conducted shows an increase in effects over the years. Much smaller effect sizes occurred in the 1980s than in the late 1990s and early 2000s (Gentile & Anderson, 2003).

Amount of Play vs. Content of Play

By now, the scientific evidence of potentially harmful effects from violent video games is becoming clearer—playing violent video games appears to increase aggressive thoughts, feelings, and behaviors, both short-term and long-term. It is important, however, to note a critical distinction implicit throughout this chapter—that there may be important differences in the potential effects based on *amount* of game play compared to those based on the *content* of the games played. Many studies (particularly those

using data from the 1980s) treated amount of game play as a correlate and found mixed results. More recent studies that carefully separate amount of play from the content of play have shown that amount seems to be negatively related to school performance, but it is only weakly associated with aggressive and antisocial behaviors, most likely because only some of the games played have violent content. Conversely, playing games with violent content is positively related to aggressive variables, but is at most only marginally related to school performance (e.g., Anderson & Dill, 2000; Anderson et al., under review; Gentile et al., 2004). This finding again makes it clear that the question, "Are video games good or bad?" is a false dichotomy. Playing a moderate amount of nonviolent games seems to be benign; and if one plays games with educational content (even relatively infrequently), the effect is likely to be positive, at least on knowledge in that educational domain. But if one plays games with violent content, the effects seem to be negative. These findings appear to result from the simple fact that children learn whatever content their video games teach.

The Question of Youth "Vulnerability"

Many people have assumed that children might be especially "vulnerable" to the effects of violent video games. There are several plausible reasons why this might be true. First, children have less real-life experience to which they can compare portrayals of violence in video games, and therefore may learn more from them. Second, children (especially young children under 8) do not have the same understanding of the fantasy-reality distinction that adults do, and therefore may accept media violence portrayals as more "real." Each of these reasons is theoretically justifiable. Unfortunately, little research supports the idea that children aged

7 or above are more vulnerable to the effects of playing violent video games than adults (Anderson et al., under review). Adults who play violent video games also show both short-term and long-term effects on aggressive thoughts, feelings, and behaviors (Anderson & Bushman, 2001).

MEDIA VIOLENCE AS A RISK FACTOR FOR AGGRESSION

Violent video games came under intense scrutiny in the public eye in the late 1990s as a result of tragic school shootings in which the shooters had a history of playing violent video games (e.g., West Paducah, KY [December, 1997]; Jonesboro, AR [March, 1998]; Springfield, OR [May, 1998]; Littleton, CO [April, 1999]; Santee, CA [March, 2001]; Wellsboro, PA [June, 2003] and Red Lion, PA [April, 2003]). The news media have linked violent video games to other violent crimes, including a violent crime spree in Oakland, CA (January, 2003); five homicides in Long Prairie and Minneapolis, MN (May, 2003); beating deaths in Medina, OH (November, 2002); and Wyoming, Michigan (November, 2002); and the Washington, D.C., "Beltway" sniper shootings (Fall, 2002). As early as 2000, the U.S. Federal Bureau of Investigation reported that one of the warning signs characteristic of school shooters was that the high-risk student "spends inordinate amounts of time playing video games with violent themes, and seems more interested in the violent images than in the game itself" (O'Toole, 2000, p. 20).

Although these highly publicized tragedies have drawn attention to the potential effects of playing violent video games, these are actually *not* good examples of the effects. In each of these cases, the shooters had several risk factors for aggressive behavior. Research has shown that there are very many risk factors for aggression, such as poverty, a

history of having been abused, psychological disorders, gang membership, drug use, media violence, and inflated self-esteem (U.S. Department of Health and Human Services, 2001). We argue that in order for a “normal” child to become seriously violent, he or she would need to have several of these risk factors present (Gentile & Sesma, 2003). No single risk factor is typically strong enough to cause such an extreme behavior as a school shooting. That said, however, there is one important difference between media violence and most of the other risk factors for aggression—it is the one that is *easily controlled*. Even the parent in a family living in poverty (and many families living in poverty have video game systems) can say, “No, you can’t play that game. Play this one instead.”

If one adopts the view that media violence exposure is a risk factor for aggression, it provides a much clearer understanding of the research. For example, the lack of evidence for youth vulnerability suggests that violent video game exposure is a risk factor for everyone who plays, regardless of age, sex, or other factors. However, this does not mean that most people who play violent video games will later become violent. It *does* mean that their risk is elevated. If there are additional risk factors, the risk is further elevated. With enough risk factors, it becomes extremely likely that an individual will behave with inappropriate aggression at some point. This is similar to predicting heart disease: Smoking elevates the risk of having a heart attack. Smoking is not the sole “cause” of the heart attack, but it does increase the risk—it is a causal factor. If one also does not exercise, the risk is further increased. With each additional risk factor, such as family history of heart disease, or poor diet, the risk increases until it becomes statistically very predictable whether one is likely to have a heart attack. This approach to understanding violent video games can be empirically tested.

In the longitudinal study of third-to-fifth graders, several risk factors for aggressive

behavior were measured, including sex, hostile attribution bias, prior aggression, and video game violence exposure. As predicted by a risk factor approach, the group with the least predicted risk of physical fights at Time 2 are (1) girls who have (2) a low hostile attribution bias, (3) have not been involved in fights previously, and (4) who do not play violent video games. The group with the greatest predicted risk of physical fights are (1) boys who have (2) a high hostile attribution bias, (3) have been involved in fights previously, and (4) who play a lot of violent video games. As is shown in Figure 12.1, this is exactly the pattern that was found (Anderson et al., under review). This pattern is identical to that found in a study of adolescents where violent video game play and trait hostility were both measured (Gentile et al., 2004). In that study, both hostility and violent game play were related to physical fights, but the combination was greater than either alone.

The utility of a risk factor approach is further evidenced by considering the opposite side—protective factors. Theoretically, active parental involvement in children’s media habits should serve as a protective factor for later aggressive habits (Austin, 1993, Dorr & Rabin, 1995; Lin & Atkin, 1989), a prediction that has received some confirmation. Although boys are more likely than girls to be involved in physical fights, if their parents are more involved in their media habits, their risk of fighting is decreased. In addition, although girls are less likely overall to get into physical fights, if their parents are involved in their media habits, their risk for fighting is diminished by almost half (Anderson et al., under review). Putting the risk and protective factors together, the group with the least predicted risk of physical fights would be (1) girls who have (2) a low hostile attribution bias, (3) have not been involved in fights previously, (4) who do not play violent video games, and (5) who have parents who are highly involved in their media habits.

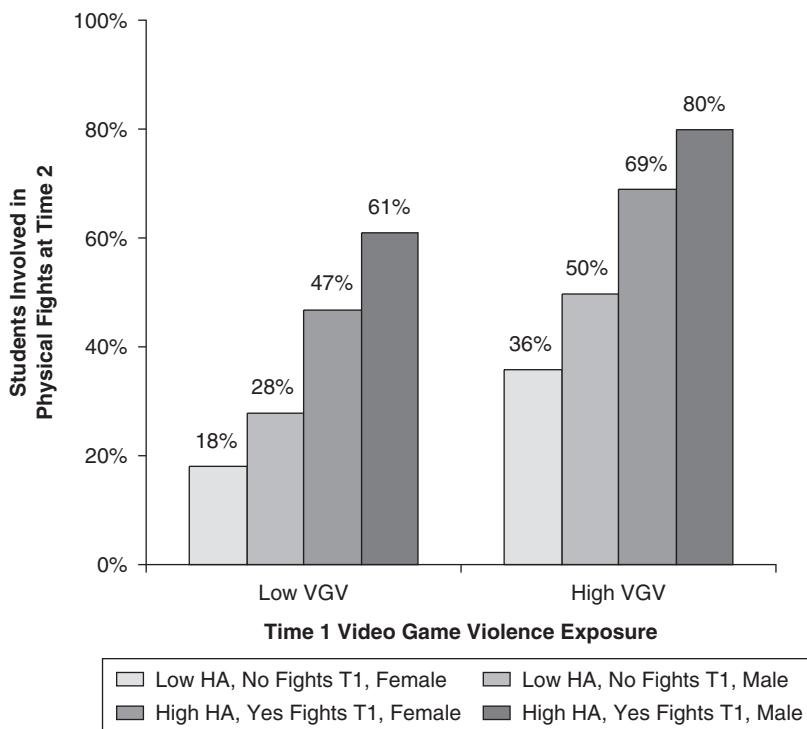


Figure 12.1 Predicted likelihood of physical fights at Time 2 as a function of hostile attribution bias, involvement in physical fights at Time 1, sex, and video game violence exposure (VGV)

Source: Anderson, C. A., Gentile, D. A., & Buckley, K. E. (*under review*). Reprinted by permission.

Children with the greatest predicted risk of physical fights would be (1) boys who have (2) a high hostile attribution bias, (3) have been involved in fights previously, (4) who play a lot of violent video games, and (5) whose parents are not involved in their media habits. This is exactly the pattern that is found in Figure 12.2. The highest risk group is over five times more likely than the lowest risk group to become involved in physical fights by Time 2, 16% compared to 84%.

IMPLICATIONS FOR PUBLIC POLICY

Adopting a risk factor approach may be particularly beneficial when attempting to determine public policies regarding children's exposure to media violence. This is similar

to the risks associated with smoking, and resembles how scientists studying criminology attempt to understand the predictors of criminal behaviors. Scientific evidence is an important factor in the adoption of good public policies, but it is usually divorced from what the "appropriate" policies could or should be. Only one-third of smokers ever get lung cancer, but that does not mean that smoking is "good" for the other two-thirds. Smoking is a risk factor for all smokers, regardless of whether they ever actually get cancer. Public policy regarding smoking has tended to have a two-tiered approach. For adults, most modern societies provide information about the risks associated with smoking, but allow adults the freedom to accept those risks. For children, most societies support parents' efforts to keep their children

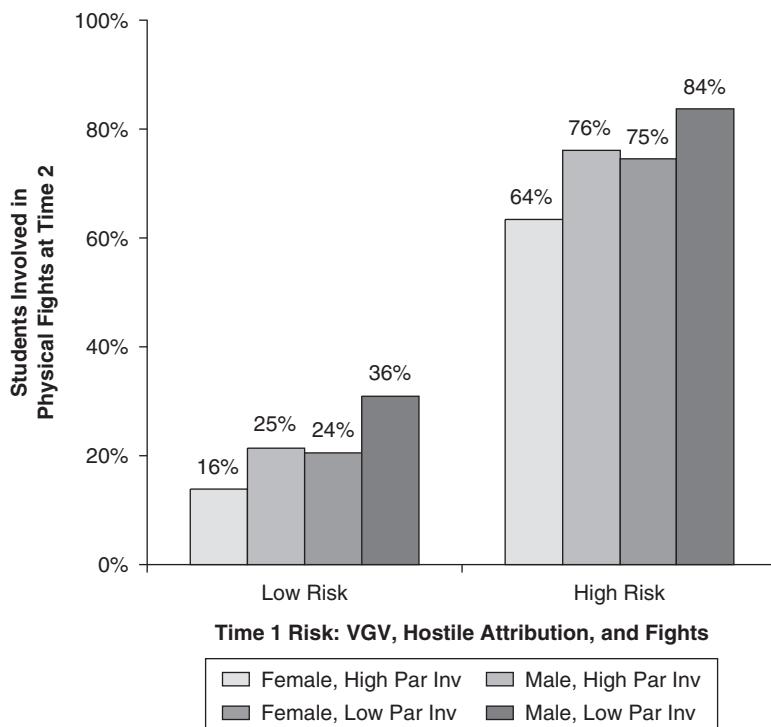


Figure 12.2 Predicted likelihood of physical fights at Time 2 as a function of hostile attribution bias, physical fights at Time 1, sex, video game violence exposure (VGV), and parental involvement

in press

Source: Anderson, C. A., Gentile, D. A., & Buckley, K. E. ([under review](#)). Reprinted by permission.

from beginning to smoke, which includes making the purchase of tobacco products by minors illegal. This two-tiered approach was not determined by scientific research, which suggests that smoking is likely harmful for all who smoke, regardless of age. Instead, the research evidence was one part of the information used in conjunction with several other nonscientific considerations deemed relevant to public policy decisions.

Although we agree that the research on both general media violence and specific video game violence is sufficiently definitive and clear to contribute to public policy debates, we also believe that it is important to focus on the scientific merits of various possible policies. Scientific evidence does not and cannot automatically translate into effective public policy. There are at least four very different

and important sources of information underlying the formulation of effective public policy, as Figure 12.3 illustrates, science facts, legal issues, personal values, and political realities. Good scientific facts can and should influence public policy in at least two major ways. First, well-developed science can identify societal problems that might require some sort of public policy intervention. Second, it can identify policies that are likely to work (e.g., Head Start programs) as well as those unlikely to work (e.g., midnight basketball). In both cases, science contributes by providing key answers to factual questions.

The Three Pillars of Responsibility

As the evidence of negative effects of violent games becomes more compelling, parents,

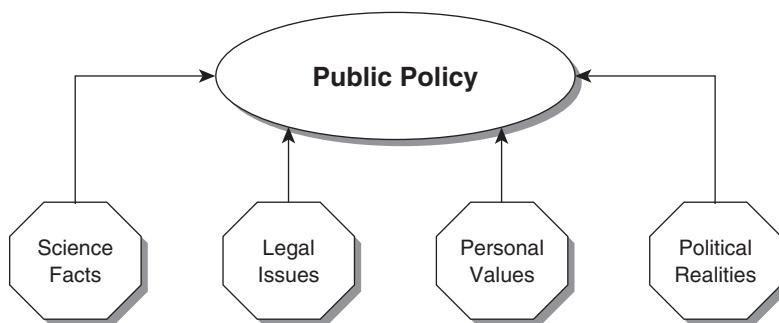


Figure 12.3 Relation of Scientific Information to Public Policy

educators, and policy makers are increasingly concerned about what to do. From our perspective, there are at least three pillars of responsibility—the video game industry, the rental and retail industry, and parents.

The video game industry has at least three responsibilities. First, it must clearly and accurately label the content of games, so that parents know what they are getting before buying. Recently, the authors of a study of “Teen”-rated games pointed out that there is a “significant amount of content in T-rated video games that might surprise adolescent players and their parents” (Hanninger & Thompson, 2004, p. 856). Both the ratings and the content descriptors being provided by the current system are suspect and need improvement (Gentile, Humphrey, & Walsh, 2005). The second responsibility of the video game industry is to market their products appropriately. Advertisements for mature-rated (“M”-rated) games have been seen in *Sports Illustrated for Kids* and other magazines with high proportions of youth readers (Federal Trade Commission, 2000, 2001, 2004). Indeed, the Federal Trade Commission (FTC) has documented numerous ways in which game manufacturers have explicitly marketed their M-rated games to children (although this practice has declined in response to actions taken by the Entertainment Software Association). It is inappropriate and unethical for the video

game industry to label some games as “not for kids” while vigorously marketing those same games to children. The video game industry’s third responsibility is to help educate parents about why ratings matter. The industry has provided what amounts to, at best, a mixed message to parents. On the one hand, they tout how good their rating system is (e.g., Entertainment Software Association, 2004), while on the other hand they claim (in television, newspaper, and magazine reports and interviews; in courtroom briefs; in conference addresses) that no research shows that violent games can lead to negative outcomes. For example, Doug Lowenstein, president of the ESA, stated in a May 12, 2000, interview on CNN, “There is absolutely no evidence, none, that playing a violent video game leads to aggressive behavior.” Beyond not being truthful, this approach only serves to confuse the public about why they should learn about and use ratings.

The rental and retail industries have two responsibilities. First, they must create policies under which children under 17 (18 would seem a more appropriate age cutoff) may not buy or rent mature-rated games without parental permission. Many stores, including large chains and superstores, have dragged their heels in instituting such policies. Second, retailers must enforce these policies. In one “sting operation” conducted by the National Institute on Media and the Family, children as

young as 7 were able in half of all attempts to purchase M-rated games (Walsh, Gentile, Gieske, Walsh, & Chasco, 2003). Similar sting operations conducted by the FTC found that teenagers are able to purchase M-rated games 69% to 85% of the time (FTC, 2000, 2001, 2004). Parents should be able to expect that stores will not allow children access to M-rated games in much the same way that they expect movie theaters to deny children entry to R-rated movies when parents drop them off at the theatre, or that bars and liquor stores will not allow underage people to purchase alcohol products.

The third pillar of responsibility is parents. Parents have three principal responsibilities. First, they need to educate themselves about the video game ratings (there are three main ones—"E" for everyone, "T" for teen, "M" for mature) and the content descriptors associated with the games. Second, they need to learn why it is important to pay attention to the ratings and descriptors. Here is where the research is so useful. In short, both *amount* and *content* matter. Parents who put limits on the amount and content of games that children play have children who get better grades and have fewer aggressive outcomes (e.g., Anderson et al., under review; Gentile et al., 2004). Finally, parents need to act on their knowledge. Just as playing violent games is a risk factor for negative outcomes for children, active parental involvement in children's video game habits appears to act as a protective factor (although the specific mechanisms for this have not yet been identified).

Public Policy Options

What public policy options exist to help encourage and support the responsibilities identified above? Several options are available, including supporting education, voluntary industry ratings, mandatory industry ratings, governmental ratings, mandatory independent ratings, legal access restrictions, and restrictions on production. Each will

be described briefly below, although we recognize that these do not exhaust the list of possible options.

Education

One obvious solution is to provide much better public education about the deleterious effects of exposing children and youth to media violence. The main idea is that if people truly understood the consequences, they would cut consumption of violent media. Although 95% of parents claim to be concerned that children are exposed to too much inappropriate content in entertainment media, only half of parents (52%) say they have *ever* used the video game ratings (Rideout, 2004). Even this may be a generous statistic. In a study of adolescents, only 31% said that their parents understand the ratings, and fewer than one in five (19%) say that their parents have ever used the ratings to keep them from getting a game (Gentile et al., 2004). There have been few publicly funded efforts to educate parents about media ratings and the need to use them. Numerous parent and child advocacy groups have attempted to provide such education, and the video game industry has made attempts to provide information about the ratings without explaining why it is important to use them. The high rate of media violence consumption demonstrates that such small, underfunded, piecemeal efforts have largely failed to influence the general population.

Voluntary ratings by the industries

This has been the dominant approach in the United States for many years. Although nominally "voluntary," the ratings systems for television, films, music, and video games were in each case created only after Congress threatened the industries with government regulation. This approach has failed for several reasons. First, existing rating systems are flawed in numerous ways (Gentile et al., 2005). They are based on invalid assumptions

about what is safe versus harmful for individuals of various ages; the rating criteria are frequently misapplied; the rating criteria have become more lenient over time (e.g., Thompson & Yokota, 2004); and age-based systems often encourage underage consumption. For example, in content analyses of E-rated games (purportedly fine for "Everyone"), intentional violence against game characters was rewarded or required for advancement in 60% of the games, and more importantly, there was no content descriptor to alert parents to the violent content for almost half of them, 44% (Thompson & Haninger, 2001). In a content analysis of T-rated games ("Teen"), nearly half, 48%, of the games included content that was not described on the box (Haninger & Thompson, 2004). Second, the entertainment industries frequently fail to follow their own guidelines, thereby allowing, and in many cases actively encouraging, underage consumption. For example, in a validity study of video game ratings, parents felt that under half of T-rated games, 43%, were completely appropriate for teenagers (Walsh & Gentile, 2001). Third, as shown above, parents frequently fail to understand the different rating systems (i.e., TV, video game, movie, music, etc.), how to use them, or the serious consequences of allowing one's children to be repeatedly exposed to media violence.

Mandatory ratings by the industries

Governments could require the industries to provide and enforce their own ratings systems. This has never been done in the United States or anywhere else as far as we know. The 1996 Telecommunications Act required that television ratings be created, but it did not specify how or by whom. We suspect that there would be many unsolvable problems with a government-mandated, industry-controlled system. For example, conflicts between the competing interests of the government (to act in the best interests of

children) and the industry (to maximize sales and profits) would be likely, with resulting First Amendment dilemmas.

Governmental ratings of an advisory nature

Governments could create their own ratings system and agency, and require that all entertainment media products be rated by the government agency prior to distribution and sale. Many countries have such systems in place (e.g., Australia, the United Kingdom). However, we know of no studies of their effectiveness in reducing children's exposure to harmful materials.

Mandatory universal ratings provided or validated by an independent third party

Currently, there are different ratings for television shows, movies, home video games, video games in arcades, music, Internet sites, and so forth. Because multiple ratings systems are confusing and often contradictory for parents, governments could enact legislation requiring that the entertainment industries create one universal rating system so that parents need not learn the full "alphabet soup" of different ratings systems. Furthermore, legislation could mandate that the ratings be administered independently of each medium. Currently, U.S. TV ratings are assigned by the TV networks, movie ratings are created by the Motion Picture Association of America, video game ratings are assigned by the Entertainment Software Rating Board, and so on. Legislation might also mandate that an independent ratings review board be created to conduct research on the validity of the ratings and to maintain standards. Many industry representatives have argued that a universal ratings system is not possible, and that ratings systems must be different because the various media are different (e.g., Baldwin, 2001; Lowenstein, 2001; Rosen, 2001). These claims seem very difficult to support. First,

organizations like the National Institute on Media and the Family have already created universal ratings systems and applied them successfully across media types (e.g., Walsh, Gentile, & van Brederode, 2002). Second, although TV, movies, music, and video games certainly are different in important ways, the concerns that parents have about violence, offensive language, and sexual content are similar across all types of media. There has been a great deal of research on how to create better and more effective ratings systems (Gentile et al., 2005). It appears to us that such a system could be created and that there are several good options for creating or selecting a third-party organization to oversee the system.

Legal-access restrictions

Governments could (and sometimes do) restrict access to certain types of material. Government-enforced, age-based ratings and restrictions are fairly common (e.g., the United Kingdom, Australia, Canada, Germany), but are almost entirely absent in the United States. Nonetheless, this approach seems feasible in the United States for two reasons. First, the media industries concede that some media products are not appropriate for children (and give them R [movie], TV-MA [TV], or M [video games] ratings). Second, legal precedent in the United States has established that the government has an entirely appropriate role in specific instances in limiting the influences and activities to which children are exposed. For example, state and local authorities routinely restrict minors' access to tobacco, guns, pornography, and gambling. In fact, the U.S. Supreme Court, in *Ginsberg v. New York* (1968) upheld restrictions on minors' access to pornography where it was "rational for the legislature to find that the minors' exposure to [such] material *might be harmful*" (emphasis added). The media violence research conducted to date has clearly met this test, demonstrating that exposing children and youth to violent media is harmful

(although legislatures have yet to concur with the consensus among scientific and public health organizations). It is important to note that this is not the only legal precedent under which regulating access could be legally defensible while still being sensitive to First Amendment concerns (see Saunders, 2003, for an excellent review).

At all levels of government, bills have been introduced to restrict youth access to M-rated games (e.g., Congressional House Resolution 669; Washington House Bill 1009; Florida House Bill 663; St. Louis County Ordinance 20193; Indianapolis City Council Violent Video Games Ordinance; for more examples, go to <http://www.medialegislation.org>). Most have been overturned after legal challenges by the video game industry. We find it ironic that the video game industry has fought every legislative attempt to restrict the sale of M-rated games to minors as this suggests that the industry is unwilling to stand behind its own ratings. The result is that over half of fourth- through twelfth-grade boys report buying M-rated games, with almost one in four admitting that they purchased M-rated games without parental knowledge (Walsh et al., 2003).

Governmental restrictions on production

Many governments (including the U.S.) have made the production of certain types of materials illegal. For example, making sexually explicit films using minors is illegal in the United States. "Snuff" films, in which people are filmed being killed, are also illegal. In a sense, such productions are illegal because the activities involved in the making of such materials are themselves illegal (sex with a minor, murder). However, further restrictions on production of entertainment materials involving otherwise legal behaviors are likely to encounter the greatest problems, given the high value most people (ourselves included) place on freedom of expression.

CONCLUSION

There has been too little serious public policy debate concerning how best to reduce exposure of children and youth to media violence. Many of the debates that have occurred in Congress, the popular press, and conferences have often focused on *whether* there is sufficient scientific evidence of harmful effects to support public policy actions. Some debates have conflated other public policy issues with the basic scientific question of whether there are significant harmful effects. Some U.S. First Amendment proponents who are vociferous critics of media violence research do

not seem to understand that the scientific question (Are there harmful effects?) is different from the legal question (Are proposed policies legal under the U.S. Constitution?).

As the medical, public health, and psychological scientific communities have repeatedly stated, the scientific debate about *whether* there are harmful effects of media violence is over. We believe that it is time to move on to the more difficult public policy questions concerning whether modern societies should take action to reduce the high rates of exposure of children and youth to media violence, and if so, what public policies would likely be the most effective.

APPENDIX

Table 12.1 Descriptions of Video Games Mentioned

Name	Year of Release	Description
Death Race	1976	Driving simulator in which the goal is to run down as many stick-figure people as possible
Double Dragon	1987	Hand-to-hand fighting game, in which two martial arts masters must defeat the Black Warriors gang to rescue a captive woman
Mortal Kombat	1992	Hand-to-hand fighting game in which one advances by inflicting fatal damage to a series of opponents. Included blood and gore
Mortal Kombat II	1993	Hand-to-hand fighting game in which one advances by inflicting fatal damage to a series of opponents
Castle Wolfenstein 3D	1992	The first “First-Person Shooter,” in which one advances by exploring a maze-like fortress while killing Nazi soldiers
Doom	1993	A First-Person Shooter game in which one advances by exploring a maze-like environment while killing monsters
Soldier of Fortune	1999	A First-Person Shooter game in which one advances by exploring an urban setting while killing terrorists and rescuing hostages. This game boasted a new level of realistic violence
Doom III	2004	A First-Person Shooter game in which one advances by exploring a maze-like environment while killing graphically realistic monsters

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