THE HONORABLE ROBERT S. LASNIK

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

VIDEO SOFTWARE DEALERS ASSOCIATION; INTERACTIVE DIGITAL SOFTWARE ASSOCIATION; WASHINGTON RETAIL ASSOCIATION; INTERACTIVE ENTERTAINMENT MERCHANTS ASSOCIATION; INTERNATIONAL GAME DEVELOPERS ASSOCIATION; and HOLLYWOOD ENTERTAINMENT CORPORATION,

Plaintiffs,

v.

NORM MALENG, in his official capacity as King County Prosecuting Attorney; GARY LOCKE, in his official capacity as Governor of the State of Washington; and CHRISTINE O. GREGOIRE, in her official capacity as Attorney General of the State of Washington,,

Defendants.

NO. CO3-1245L

REPLY TO DEFENDANTS' OPPOSITION TO PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION



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## I. INTRODUCTION

Defendants (hereinafter "the State") try very hard both to minimize the constitutional implications of HB 1009 and to suggest that there is a good reason for that law. But the facts remain the same. The State has enacted a law that directly censors protected expression because it contains content and a viewpoint of which the State disapproves. No legitimate justification for such a law exists. If allowed to go into effect, HB 1009 will infringe the First Amendment rights of the Plaintiff game creators, publishers, and distributors whose artistic expression will be directly censored, as well as the rights of those who will be unable to gain access to that expression. Plaintiffs are entitled to a preliminary injunction to prevent this irreparable harm.

## II. ARGUMENT

### A. Video Games Are Expression Fully Protected by the First Amendment.

The State makes absolutely no attempt to counter Plaintiffs' detailed factual showing that computer and video games are inherently expressive works. *See* Mot. 3-6. Moreover, its claim that video games are not expressive works protected by the First Amendment makes no sense because it concedes that HB 1009 is a content-based regulation: the law restricts only "violent" games, defined by the statute as games containing depictions of violence toward "public law enforcement officers." *See* State Opp. 11 n.8. Such a content-based law is a quintessential regulation of expression implicating the First Amendment. *See, e.g., United States v. Playboy Entm't Group, Inc.*, 529 U.S. 803, 811-12 (2000). For that reason, other courts have unanimously held that when video games are regulated based on their "violent" content, as here, they merit the same First Amendment protection accorded to all other expressive media, including television, movies, music, and books, all of which often contain similar "violent" content. *Interactive Digital Software Ass'n v. St. Louis County*, 329 F.3d 954, 956-58 (8th Cir.



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2003) ("*IDSA*") (M. Arnold, J.); *American Amusement Mach. Ass'n v. Kendrick*, 244 F.3d 572, 577-78 (7th Cir.) ("*AAMA*") (Posner, J.), *cert. denied*, 534 U.S. 994 (2001); *James v. Meow Media, Inc.*, 300 F.3d 683, 695-96 (6th Cir. 2002) (Boggs, J.), *cert. denied*, 123 S. Ct. 967 (2003); *Sanders v. Acclaim Entm't Inc.*, 188 F. Supp. 2d 1264, 1279 (D. Colo. 2002); *Wilson v. Midway Games, Inc.*, 198 F. Supp. 2d 167, 181 (D. Conn. 2002). The fact that video games are interactive, and may present the story from a first-person perspective, in no way distinguishes them from other media or detracts from their expressive qualities. *See AAMA*, 244 F.2d at 577 ("All literature (here broadly defined to include movies, television, and the other photographic media, and popular as well as highbrow literature) is interactive; the better it is, the more interactive."); *IDSA*, 329 F.3d at 957-58.[1]

**B. Plaintiffs' Speech Is Censored by the Statute.**

The State seems to suggest that Plaintiffs lack standing to bring one or more of the constitutional claims asserted here. *See, e.g.*, State Opp. 8, 19 n.12. That is simply wrong. Plaintiffs include creators, publishers, and distributors of video games, whose speech will be censored and chilled by the statute. *See, e.g.*, Mot. 3. Indeed, Plaintiff International Game Developers Association is an association of creators of video games. *See, e.g.*, Compl. ¶¶ 16, 44. If this were a statute barring the sale of violent books instead of video games, analogous plaintiffs would be authors and publishers, who clearly would have standing to assert their First

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[1] Lacking any pertinent legal support for its claim that computer and video games are not expression, the State relies almost exclusively on 20-year-old cases concerning non-content based zoning laws targeted at video arcades, *see* State Opp. 9-11. But those cases were not relevant when they were decided and are even less relevant now, since, as the State acknowledges, video games have changed dramatically in two decades. *Id.* at 2 ("Video games have emerged from their infancy into a technologically sophisticated realm of action, graphics, and lurid violence.") One of the very cases relied upon by the State "recognize[d] that in the future video games which contain sufficient communicative and expressive elements may be created." *Marshfield Family Skateland, Inc. v. Town of Marshfield*, 450 N.E.2d 605, 609-10 (Mass. 1983).



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Amendment rights. Moreover, Plaintiffs have standing to raise not only their own free speech claims, but also those of their prospective audience. *See Virginia v. American Booksellers Ass'n*, 484 U.S. 383, 392-93 (1988) (bookstores may assert First Amendment rights of book purchasers).

### C. The State Has Not Shown That HB 1009 Is a Narrowly Tailored Means of Serving a Legitimate and Compelling State Interest.

Because HB 1009 restricts speech on the basis of content, it must satisfy strict scrutiny. *Playboy*, 529 U.S. at 811-12. Thus, the State must (1) articulate a legitimate and compelling state interest; (2) prove that HB 1009 is "necessary" to serve that interest (*i.e.*, prove that the asserted harms are real and would be materially alleviated by the statute); and (3) show that HB 1009 is narrowly tailored to achieve that interest. *See, e.g., R.A.V. v. City of St. Paul*, 505 U.S. 377, 395 (1992); *Turner Broad. Sys., Inc. v. FCC*, 512 U.S. 622, 664-65 (1994). The State does not come close to satisfying this exacting test. Nor is it conceivable that it could do so after development of a more extensive factual record.

#### 1. "Fostering Respect" for Government Officials Is a Patently Illegitimate State Interest.

The State appears to have abandoned the rationale of "foster[ing] respect for public law enforcement officers" that was expressly set forth in HB 1009. Act § 1; *see* Mot. 15 (describing legislative history). That is not surprising, because any such interest is facially illegitimate. The Constitution forbids the State from restricting speech in order to control what individuals think, *Ashcroft v. Free Speech Coalition*, 122 S. Ct. 1389, 1403 (2002), particularly what they think of their government. As the Supreme Court has made clear, "[i]f there is any fixed star in our constitutional constellation, it is that no official, high or petty, can prescribe what shall be



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orthodox in politics, nationalism, religion, or other matters of opinion." *West Virginia State Bd. of Educ. v. Barnette*, 319 U.S. 624, 642 (1943).[2]

**2. The Goal of Preventing Violence Toward Law Enforcement Officers Cannot Justify HB 1009.**

To the extent that the State seeks to defend HB 1009 as a means of "reducing the real risk of copycat or replicating behavior in violence toward law enforcement officers," State Opp. 12, it fails to recognize—let alone satisfy—the controlling legal standard. As Plaintiffs explained, *see* Mot. 12, an asserted interest in suppressing speech based on a prediction that it will cause listeners to engage in violence is legitimate only to the extent that the law is tailored to satisfy the standards of *Brandenburg v. Ohio*, 395 U.S. 444 (1969). Even speech that *expressly advocates* lawless activity cannot be regulated unless it is "*directed to* inciting or producing *imminent* lawless action and is *likely* to incite or produce such action." *Id.* at 447 (emphasis added); *see Free Speech Coalition*, 122 S. Ct. at 1403 (relying on *Brandenburg*). There may be many forms of expression—including works of political and religious advocacy, for example—that could be shown through research possibly to trigger an idiosyncratic violent reaction by somebody. But such a prediction, even assuming its empirical validity, is constitutionally insufficient. *See, e.g., James*, 300 F.3d at 693, 698-99 (applying *Brandenburg* and rejecting attempt to regulate violent video games despite possibility of "idiosyncratic" reactions); *see also* Mot. 12-16 (discussing cases applying *Brandenburg*).

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[2] In hiding from this rationale, the State also tries unsuccessfully to claim that the statute is viewpoint neutral. *See* State Opp. 11 n.8. Viewpoint discrimination, "an egregious form of content discrimination," occurs "[w]hen the government targets not subject matter [*e.g.*, "violence"], but particular views taken by a speaker on a subject." *Rosenberger v. Rector and Visitors of Univ. of Va.*, 515 U.S. 819, 829 (1995). By targeting only violence aimed at law enforcement officers, and only when "inflicted" by the game player's character, HB 1009 most certainly prefers a pro-government, pro-law enforcement viewpoint over others.



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Moreover, the State does not offer anything approaching the compelling evidence that would be required to justify censoring speech. *See, e.g., Playboy*, 529 U.S at 822 ("The question is whether an actual problem has been proved in this case."). It asks the Court to defer to the Legislature's "finding" of a "correlation between exposure to violent video games and various forms of hostile and antisocial behavior." Act § 1, *see* State Opp. 3. But such a legislative assertion is plainly insufficient; it does not even purport to be a finding of correlation to any actual violence, much less *causation* of violence against *law enforcement officials*. The State then cites to anecdotal, baseless hearsay to claim that video games have "caused" violence. *See, e.g.*, State Opp. 12 n.9 (quoting newspaper article quoting a grandmother); State Opp. Exh. H (testimony of John Thompson, an activist and lawyer who unsuccessfully brought suit against video game companies in *James*). Notably, none of the anecdotes involve any violence against law enforcement officials, and the State's facts are wrong.[3] In any event, anecdote and uninformed opinion cannot be the basis for the censorship of speech. *Playboy*, 529 U.S at 822 ("[T]he Government must present more than anecdote and supposition.").

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[3] Contrary to the State's claims, the teenager convicted of the shootings in Paducah, Kentucky has stated that video games had nothing to do with his actions. *See* Andrew Wolfson, *Teen Killer Says He Isn't A Monster*, The Courier-Journal, (Sept. 12, 2002), available at http://courier-journal.com/localnews/2002/09/12/ke091202s275651.htm. Moreover, contrary to the Pennsylvania grandmother's supposition, *see* State Opp. Exh. F, planning to shoot classmates and teachers has nothing to do with the themes of Metal Gear Solid 2, in which the player's character attempts to save the world by stopping an armed group from stealing an unusually dangerous weapon. *See* http://www.metalgearsolid2.de/site/auswahl.html. And the State fails to note that the boy's father reported that although his son "enjoyed playing 'Metal Gear Solid,' . . . his interests had lately evolved toward car-racing and flight-simulation games," that "the file from his parents' 1997 divorce . . . indicate[d]" that the boy "had received psychiatric treatment and that his mother expressed concerns about 'psychotic' and 'uncontrollable' violent outbursts," that he was being picked on at school for being overweight, and that he had ready access to an arsenal of weapons with which he regularly hunted with his dad. *See* Mark Scolforo, *Student's suicide leaves troubling questions*, Associated Press, Wellsboro, PA (June 14, 2003), available at http://www.tnonline.com/archives/news/2003/06.14/suicide.html; State Opp. Exh. F.



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The State then cites to a handful of academic articles, repeated in testimony before the United States Congress, *see* State Opp. 4-5, which it claims "support the conclusion that violent video games promote aggressive and violent behavior." *Id.* at 5. Not only were these materials apparently never presented to the legislature that enacted HB 1009, but—as Courts of Appeals considering the very research cited by the State have recognized—these studies prove no link between video games and violence or between video games and harm to children. *See, e.g.*, *AAMA*, 244 F.3d at 578-79 (considering the Anderson & Dill study, State Opp. Exh. D, and explaining that this and other existing scientific studies "do not support" the regulation of "violent" video games, because these studies "do not find that video games have ever caused anyone to commit a violent act"); *id.* at 579 (describing the city's "claim of harm to its citizens from these games" as "implausible, at best wildly speculative"); *IDSA*, 329 F.3d at 958-59 (considering testimony of Anderson and concluding that his studies' claims of increased aggression are not "harm" of a kind or degree to support proscribing speech); *id.* at 958 (these studies simply do not show "that there is a strong likelihood that minors who play violent video games will suffer a deleterious effect on their psychological health").[4]

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[4] A good example of the limits of the cited studies is the Anderson & Dill article, State App. Exh. D, which summarizes two studies conducted on *college-age students* – not minors – and arrives at no firm conclusions. *See id.* at 776, 783. One of these studies merely reported on *correlations* between game play and personality features and academic achievement. The authors cautioned that "causal" conclusions were "risky at best." *Id.* at 782. The other merely studied reaction time and the delivery of "noise blasts" to an opponent after a player had won or lost a game. The authors did not conclude that they had produced evidence that video games cause harm – let alone violent behavior. *See also* State Opp. Exh. E at 9 (Buchanan article) (explaining the "limitations" of the study, including that the "findings reported here are correlational and do not merit casual [sic] assessment").

The State is simply wrong in its assertion that the study it attaches as Exhibit C is somehow "new" or different in kind from those rejected by other federal courts. *See* State Opp. 13. That study is merely an article reviewing prior studies. *See id.* Exh. C at 353.



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Instead, the studies, generated by a small group of dedicated opponents of portrayals of violence in any medium, are simply efforts to find some shred of empirical support for a predetermined ideological conclusion. A careful and thorough review of the existing literature shows that "media violence does not cause aggression, or if it does the effects are so weak that they cannot be detected and must therefore be vanishingly small." Jonathan L. Freedman, *Media Violence and Its Effect on Aggression: Assessing the Scientific Evidence*, x-xi, 200-01 (2002); *see* Christopher J. Ferguson, *Media Violence: Miscast Causality*, American Psychologist (June/July 2002) (noting "long history of human violence" predating any violent media, and suggesting that violent behavior is not caused by media "violence," but by underlying social problems and predilections of individual wrongdoers), attached hereto as Exhibit A. Indeed, testimony at the very same federal Congressional hearing relied upon by the State refuted the State's claims. *The Impact of Interactive Violence on Children: Hearing Before the Senate Comm. on Commerce, Science and Transportation*, 106th Cong. at 63-71 (March 21, 2000) (statement of Jeffrey Goldstein) (challenging the methodology of video game studies and explaining why the results of these studies do not support the conclusions that the studies reach), attached hereto as Exhibit B. Similarly, a 2001 Surgeon General report stated that "media violence has a relatively small impact on violence" and that no research supports the notion that violent media leads to subsequent violent behavior. See http://www.surgeon general.gov/library/youthviolence/chapter4/appendix4bsec3.html. The Government of Australia, after critically reviewing the academic research, likewise concluded:

> After examining several attempts to find effects of aggressive content in either experimental studies or field studies, at best only weak and ambiguous evidence has emerged. . . . The accumulating evidence—provided largely by researchers keen to demonstrate the games' undesirable effects—does indicate that it is very hard to find such effects and that they are unlikely to be substantial.



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Kevin Durkin & Kate Aisbett, *Computer Games and Australians Today* (Office of Film and Literature Classification 1999). Perhaps the best evidence that the "studies" cited by the State are baseless, however, is that the State completely ignores its *very own study* of the effects of "violent" video games, which, as Plaintiffs' Motion pointed out, *see* Mot. 17, concluded that "the research evidence is not supportive of a major public concern that violent video games lead to real-life violence." Wash. State Dep't of Health, Executive Summary, *Video Games and Real-Life Aggression: A Review of the Literature* (May 2000), attached hereto as Exhibit C; *see Video Games and Real-Life Aggression: A Review of the Literature*, Journal of Adolescent Health (2001), attached hereto as Exhibit D.

Finally, the State has produced no evidence specifically pertaining to violence against law enforcement officers—the subject of the State's content-based regulation. To be sure, it does include a short videotape apparently containing the two most lurid scenes of violence against police officers that it could find in the video game medium. But that hardly constitutes proof that games cause violence. Instead, it illustrates that one small category of games allows players—if they choose—to *pretend* to engage in anti-social behaviors, including violence against law enforcement officers. These games, such as *Grand Theft Auto III* and *Postal II*, create worlds in which the player can choose to act morally or immorally, responsibly or irresponsibly.[5] That may be controversial, but it hardly provides a basis to censor speech.

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[5] *See Grand Theft Auto III*: info, at http://www.rockstargames.com/grandtheftauto3/flash/main.html; John C. Breeden, *Postal II Kicks Butt*, Game Industry News, at http://www.gameindustry.com/reviews/030428postal2.asp (noting that players control important aspects of their characters' behavior). Although the videotape submitted by the State purports to contain excerpts of three games—*Duke Nukem*, *Grand Theft Auto: Vice City*, and *Postal* 2, *see* Attachment to State Opp. Exh. G, the copy served upon Plaintiffs contains excerpts of only two games, and the excerpted games appear to actually be *Grand Theft Auto III* and *Postal 2*.



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### 3. Protecting Minors From "Harmful" Content Is Not a Legitimate—Let Alone a Compelling—State Interest.

The State also suggests another interest—protecting the "well-being of minors." State Opp. 12. This alleged interest in minors' well-being is apparently modeled after the less speech-protective "harmful to minors" framework for sexual speech. *See Ginsberg v. New York*, 390 U.S. 629 (1968), *cited in* State Opp. 12. In *Ginsberg*, the Court applied mere rational basis review in upholding a statute regulating sexual speech that was allegedly "harmful to minors," or "obscene as to minors," because "obscenity" does not receive full First Amendment protection. *See* 390 U.S. at 636-40. But, as the State recognizes in distancing itself from statutes modeled on the *Ginsberg* statute, State Opp. 14-15, there is no comparable category of "violent" speech that is unprotected for minors. The Supreme Court has made clear that depictions of violence, even if containing "nothing of any possible value to society," are "as much entitled to the protection of free speech as the best of literature." *Winters v. New York*, 333 U.S. 507, 510 (1948). The sexual "harmful to minors" cases cited by the State are thus entirely inapposite, see State Opp. 12-14 (citing *Sable Communications of Cal., Inc. v. FCC*, 492 U.S. 115 (1989), *Ginsberg*, and *United States v. American Library Ass'n, Inc.*, No. 02-361, 2003 WL 21433656 (U.S. June 23, 2003)), and the State cannot benefit from the lesser standards applied to sexual speech, *IDSA*, 329 F.3d at 959.[6]

Moreover, as explained above, the State has come forth with no evidence of real "harm" to minors sufficient to meet strict scrutiny. *See supra* Part IIB. In fact, as Judge Posner discussed in *AAMA*, it might well be more harmful to seek to insulate minors from violent

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[6] The State claims to find in *United States v. American Library Association* support for barring minors from access to "inappropriate" materials other than sexual "harmful to minors" material. State Opp. 14. But the law at issue was limited to obscenity, child pornography and sexual "harmful to minors" material and nothing in the opinions justifies a broader, free-floating state effort to censor "inappropriate" materials.



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content: "To shield children right up to the age of 18 from exposure to violent descriptions and images would not only be quixotic, but deforming; it would leave them unequipped to cope with the world as we know it." *AAMA*, 244 F.3d at 577.

**4. HB 1009 Is Not Narrowly Tailored.**

Even assuming a compelling state interest, the State makes no real attempt to counter Plaintiffs' narrow tailoring argument or Plaintiffs' argument that the State failed to consider less speech-restrictive means of achieving its stated goals. *See* State Opp. 14-15. Rather, the State returns to its refrain that "[t]he language of the statute was intentionally narrow in order to pass constitutional muster." *Id.* at 15. Although it is true that HB 1009 narrowly targets one particular type of violent speech—indeed, so much so that it regulates speech based on viewpoint—that has absolutely nothing to do with the Constitution's requirement of narrow tailoring. "Narrow tailoring" in the Constitutional sense requires that regulation of speech be limited to what is necessary to achieve the legislature's end, and requires the State to explain the rejection of less speech-restrictive alternatives. Here, the State's purported ends are preventing real-world violence and protecting minors' "well-being," but the State alleges no link between the "narrow" class of expressive works it has selected for regulation and the harms it seeks to prevent: It has produced no studies or other evidence—much less studies sufficient to justify suppressing speech—that games involving law enforcement officers have different effects, if any, than any other games depicting violence. Thus, the State's discussion of "narrow tailoring" simply highlights the arbitrary nature of the category of speech censored by the State. Because HB 1009 is not narrowly tailored to serve any State interest, it fails constitutional scrutiny.

**D. The Statute Is Impermissibly Vague.**

Rather than attempt to respond to Plaintiffs' examples of HB 1009's unconstitutional vagueness, *see* Mot. 19-22, the State effectively concedes that HB 1009 is vague. Addressing



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Plaintiffs' request for clarification of the term "law enforcement officer," the State responds: "If the statute contained precise language defining, for instance, a public law enforcement officer, designers and makers of a video game could certainly design around such a precise definition, eviscerating the intent of the statute." State Opp. 16. This response can only be interpreted as an admission that the State has crafted HB 1009 vaguely *in order to create a chilling effect on expression*. If the legislature's true intent in passing HB 1009 were merely to restrict games depicting violence toward "law enforcement officers," it would not matter that game designers could "design around such a precise definition," as long as the games did not offend the precise terms of a properly defined statute.

Moreover, the State's entirely abstract discussion of the meaning of the law does nothing to answer the specific vagueness problems Plaintiffs identified. The State makes no attempt to clarify the meaning of "law enforcement officer"—for example, are secret agents and military officers included? And the State's discussion of "realistic" raises more questions than it answers. The State suggests only that the second definition in one dictionary "appears" to be the correct definition of the statutory term "realistic." State Opp. 17. But, even under that definition, does Homer Simpson's running over Chief Wiggum in *Road Rage*, *see* Exh. B to McCrary Decl., fall within the statute? Does the violence against zombified police officers in *Resident Evil II*? *See* Exh. B. to Jimenez Decl. The State does not say, and does not explain how Plaintiffs and others will be able to know how to avoid running afoul of HB 1009.

**E. The Irreparable Harm That Would Be Caused By HB 1009 Compels An Injunction.**

The allegation of a colorable First Amendment claim entitles Plaintiffs to preliminary relief, *see Sammartano v. First Judicial District Court*, 303 F.3d 959, 973 (9th Cir. 2002), and Plaintiffs have demonstrated much more than that—they have shown HB 1009 to be facially



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unconstitutional. The State has no response to Plaintiffs' claim of irreparable harm, other than to claim that Plaintiffs' interest is solely economic. That is patently false. Plaintiffs include the very game creators and developers whose expression will be suppressed if HB 1009 goes into effect, and Plaintiffs have standing to assert the irreparable harm to their willing audience, who will also be denied access to protected expression by HB 1009. An injunction is warranted.

## III. CONCLUSION

Plaintiffs respectfully request that this Court grant a preliminary injunction.

RESPECTFULLY SUBMITTED this 26th day of June, 2003.

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# Media Violence Miscast Causality

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Interpersonal violence within the United States is an issue of great concern to psychologists, lawmakers, and other concerned citizens. As noted by Bushman and Anderson (June/July 2001), the past few decades have seen alarming increases in violent crime in the United States. Arguably, the United States is one of the most violent industrialized nations. It would seem reasonable to suggest that violence within the United States results from a complex mixture of factors, on both societal and individual levels. Yet when an issue of critical social concern arises, there is the risk that society may demand quick, simple answers. The debate over the influence of violence in the media on the violent impulses of individuals who view media seems to typify this tendency. Few would argue with Bushman and Anderson that the media have become saturated with violence. Similarly, the decades since the 1950s have seen an increase in violent crime that seems to parallel the increase in media violence. Still, attempts to make a causal connection between violence in the media and violent crime may be premature. In effect, undo emphasis is placed on a symptom, and underlying causes that reflect on either society as a whole or the choices made by individuals with criminal intent are ignored.

In comparing research on media violence with research on smoking and lung cancer, Bushman and Anderson (2001) suggested that "in both cases, the industry claims that there is no good evidence have persisted long after the scientific data clearly indicated there could be no reasonable doubt about the seriousness of the causal impact" (p. 482). Comparing media violence research with that on smoking is a powerful polemic. The extent to which the cigarette industry went to deny the effects of smoking was a travesty. Anderson and Bushman are probably correct in suggesting that the media industry should not be expected to be quick to embrace research that condemns the excesses of violence in film, music, television, and news media. However, it is not clear that research on media violence has reached the no-reasonable-doubt point that was reached by cigarette research. Cigarette smoking was demonstrated to be a necessary and sufficient cause of lung cancer. But is media violence a necessary and sufficient cause of violent behavior? As Horgan (1999) pointed out, social scientists have often been guilty of vastly overstating the significance of their findings. It could be that Anderson and Bushman presented one example of such an overstatement. In support of that premise, several critiques of Anderson and Bushman shall be presented.

- Humans are by nature a violent species and may demand violence in their entertainment. Violent media, then, are not a necessary precursor to violent behavior.
- Unlike lung cancer, which is rare outside of individuals not exposed to cigarette smoke or other inhaled carcinogens, violent behavior is common in the absence of violent media, whereas many who are exposed to violent media demonstrate no violent behavior. Violent media, then, are not sufficient to cause violent behavior.
- The effect sizes of media violence research are small. They account for only a small fraction of the variance in violent behavior.

Humans are a violent species. In 1998, Eric Harris and Dylan Klebold entered their high school in Littleton, Colorado, and systematically killed 12 students and 1 teacher before killing themselves. Although these two individuals had an established history of psychological disturbance (Holmes & Holmes, 2001), it seemed difficult to admit that two young men might have willingly perpetrated a massacre within their community. Quickly, blame began to shift to media influences, including gothic music, violent movies such as *The Matrix* , and violent video games. For many, it may have been easier to believe that Harris and Klebold were poor child victims of insidious media rather than to accept that



**EXHIBIT A**

these children were, themselves, malevolent.

Yet evidence suggests that violence is a basic facet of human nature. In a review of research on primates, Sagan and Druyan (1992) noted that violence, including assault, rape, murder, infanticide, and even warfare, are common to primates, including chimpanzees and baboons. Violent behavior may similarly have proven to be adaptive in humans ( Wilson & Daly, 1996) . As a function of species-wide evolution, some form of violent behavior may be a natural (although not desirable) trait in many individuals. Although it could be argued that such genetic tendencies merely place some individuals at risk for violent behavior and that violent media act as the catalyst, it seems unlikely that violent media alone are sufficient to bring about violent behavior.

Further, although higher rates of violence in the United States as compared with other industrialized nations may be blamed on media (although the United States shares much of its media with other nations), a more likely catalyst for violent behavior within the United States may be Americans' easy access to handguns (a circumstance not shared with most other industrialized nations). In other words, people in the United States and other industrialized nations may actually be equally violent. People in the United States may simply have better access to more efficient tools with which to kill. Hare (1993) suggested that violent behavior may be innate and inborn to the personalities of some individuals and that attempts by society to change the behavior of these individuals are unlikely to succeed. In effect, blame for the actions of individuals is deflected onto a larger societal process so that no one individual needs to accept responsibility for his or her behavior. Individuals such as Harris and Klebold then are victims, not victimizers.

Media violence is not necessary to produce violent behavior in individuals. Bushman and Anderson (2001) acknowledged that the surge of violence in the media is a recent trend. Yet violence within the United States and the world at large is nothing new and is, in fact, quite common. In examining crime rates only since the 1950s, Bushman and Anderson ignored surges in homicide rates in the 1930s, which rivaled and even exceeded homicide rates of the late 1980s (U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 1988) . Further, although crime records prior to the 1930s are fragmentary, one may find evidence in them that the United States saw violent crime waves in the late 1800s and early 1900s that rivaled or surpassed current rates of violent crime (National Commission on the Causes and Prevention of Violence, 1969) .

Thus, the United States has a long history of violence. It seems reasonable to suggest that the ebb and flow of violent crime rates through the 1800s and early 1900s do not particularly coincide with changes in either the availability or the graphic nature of available media. Furthermore, recent statistics actually document a decline in violent crime in the United States, despite little change in the amount of violence depicted in the media (Federal Bureau of Investigation, 1951—2000) . If media violence is a necessary and direct cause of violent behavior, a significant decline in violent crime should not be occurring unless violence in the media is also declining. Bushman and Anderson (2001) do not seem to suggest that that is the current state of affairs.

The effect sizes of violent media research are small and lack practical significance. Bushman and Anderson (2001) noted that the correlation coefficients for meta-analytic examinations of the relationship between exposure to media violence and violent behavior range from .11 to .31. Using the coefficient of determination ( $r$ 2), this indicates that exposure to media violence is associated with from 1.2% to 9.6% of the variance in violent behavior. Thus, the majority of the variance in violent behavior remains unexplained. Further, this observation is true not only between individuals but also within individuals. In other words, exposure to media violence may covary with 1.2% to 9.6% of the variance in violent behavior within any given individual as well as between individuals. Thus, the authors' suggestions that violent media may univariately create violent behavior within a small percentage of the population is unwarranted. If exposure to media violence were included in a multivariate analysis of violent behavior, the variance explained by media violence might be subsumed by other variables, such as individual personality or family environment. As Bushman and Anderson suggested, psychologists should not ignore small correlations, but neither are these small correlations cause for American citizens to grab their muskets, pitchforks, and torches and storm the Bastille of corporate media.

In essence, unlike the link between cigarette smoking and lung cancer, exposure to violent media is neither necessary nor sufficient to explain violent behavior in individuals. Bushman and Anderson (2001) , although well-meaning, make

the error of mistaking the symptom of a problem for the cause. Media violence may not be the root cause of violent behavior any more so now than at any other time in the long history of human violence. If psychologists wish to truly understand violent behavior, they must shift their focus away from symptoms and onto the difficult and perhaps hard-to-face causes, such as family structure, poverty, abuse, evolution, and even the motivations and predilections of those individuals who choose to engage in violent behavior.

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S. HRG. 106–1096

# THE IMPACT OF INTERACTIVE VIOLENCE ON CHILDREN

## HEARING

BEFORE THE

## COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

MARCH 21, 2000

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EXHIBIT B

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

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# APPENDIX

PREPARED STATEMENT OF DOUGLAS LOWENSTEIN, PRESIDENT, INTERACTIVE DIGITAL SOFTWARE ASSOCIATION

This testimony is submitted on behalf of the Interactive Digital Software Association [1] the trade body representing U.S. video and computer game software companies that publish games for use in the home. In 1999, the industry generated $6.1 billion in retail software sales. IDSA's 32 members account for 90% of the edutainment and entertainment software sold in the US.

I apologize for not being able to appear before the Committee in person. However, I had a long standing prior commitment in Arizona which could not be rescheduled. I hope the testimony and attachments which follow will be included in the Committee record, and I look forward to a continuing dialogue with the Members about these important issues.

The subject of today's hearing is The Effects of Interactive Violence on Children. I certainly understand the interest in this topic in the aftermath of tragic school shootings over the past few years, as well as the frenzied media reports—often inaccurate and misleading—about interactive entertainment in the months after Littleton. This is an important topic which deserves a fair and balanced discussion.

By far the most exhaustive and objective analysis of this subject was released this past December by the Government of Australia in a study entitled "Computer Games and Australians Today." This detailed report, which is provided as an Appendix to my testimony, stands out above all others for two reasons: first, it was carried out by a government with a history of tough regulation of entertainment content for the purpose of determining whether government regulation is merited; second, unlike some of those who will appear before you today, it was written by authors who lack preconceived points of view on the issue of whether violent games lead to aggressive behavior. I think it is especially helpful to the Committee since it provides an independent, unbiased, peer-based evaluation of some of the research you will hear about today. I will discuss this study in more detail later in my testimony, but let me quote to you here the key conclusion.

> "The accumulating evidence—provided largely by researchers keen to demonstrate the games' undesirable effects—does indicate that *it is very hard to find such effects and that they are unlikely to be substantial* (emphasis added)."

**The Computer and Video Game Industry Today**

Any dialogue on the effects of violent video and computer games on children must be carried out with an understanding of the broader context of the interactive entertainment industry, its products, and its customers. So before addressing the specific question of what the prevailing research tells us about the effects of violent video and computer games on children, I want to discuss briefly some facts about the interactive entertainment industry as it stands today.

There are six critical points to understand:

*Point One: The most frequent users of computer and video games are adults, not kids.* This is a surprise to many who still perceive the industry as a toy-based business appealing to adolescent males. But in fact, 70% of the most frequent users of PC games are over 18; and 38% of these are over 36. The picture is similar for video game consoles: 57% of the most frequent users are over 18, and 20% are over 36. Those products that contain violent content, and it is a minority of the total produced (see below), are made to appeal to this adult population.

*Point Two: The vast majority of games do not contain significant levels of violence, and the vast majority of top selling games are largely non-violent.* Of the top 20 best selling games in 1999, none carried a Mature rating from the Entertainment Software Rating Board (ESRB), and only five carried a Teen rating. Looking at games sold by type, the data shows that just over 5% of all games sold last year were in

[1] IDSA's members only publish software for the home. The arcade game business is a different sector with its own representatives.

the so-called "shooter" category which received so much attention after Columbine, and this category is so broadly defined that it includes such benign games as a Star Wars space war title and a version of the classic arcade game Asteroids. In fact, if one were to focus strictly on games like Doom, their percentage of the total market is even lower.

*Point Three: There is a mass market for games today which crosses all ages, genders, and tastes.* The notion that the industry should homogenize content to appeal only to young users makes as much sense as encouraging book publishers to stop publishing Steven King novels and only issue books appropriate for young readers.

*Point Four: While the market is diverse, 70% of all games made are rated by the ESRB as appropriate for everyone. Only nine percent of the more than 6,000 products rated by the ESRB have earned a Mature rating reflecting the presence of significant levels of violence. ESRB ratings have been lauded for their accuracy and reliability by such diverse observers as Sen. Joe Lieberman and child advocate Peggy Charren. And we know these ratings work when parents know about them and use them. Last summer, a survey conducted for the ESRB by the highly regarded Peter D. Hart Research Associates, Inc. found that 73% of the parents who were aware of the ESRB rating system find it helpful in making informed purchasing decisions.* We also know that nine out of ten games are actually purchased by adults for their kids so they can, if they choose, control the games their kids play. Finally, the Hart survey revealed that three out of four parents under the age of 44 provide a significant level of supervision over the games their kids play. So the control really is in their hands.

*Point Five: Between 1991–97, video game sales surged 128%. Meanwhile, between 1993–97, a period covering the most dramatic growth in video game sales, juvenile violent crime fell 40%.* No one would say that video games are responsible for falling crime rates. But these numbers do suggest that those who point to games as a leading culprit in youth violence do not have the facts on their side.

*Point Six: Many of the games sold here which have prompted concern about the effects of interactive entertainment on children are sold all over the world. In fact, in some countries, even more violent games are available. Yet, despite growth rates in foreign markets similar to those in the U.S., youth violence in these countries does not even approach the levels in our country.* If interactive entertainment causes violent behavior, why is violent crime among juveniles so low in foreign markets with the identical products? This suggests we need to look far deeper to identify the causes of youth violence than games.

**Research on Interactive Entertainment**

Let me now turn to the academic research. I have attached as an Appendix to my testimony a report analyzing the research on video game violence and other issues prepared at IDSA's request by Jeffrey Goldstein, Ph.D., Department of Social and Organizational Psychology at the University of Utrecht in The Netherlands. Dr. Goldstein has authored and edited numerous books on media violence, including his latest, "Why We Watch: The Attractions of Violent Entertainment", and is a Fellow of both the American Psychological Association and the American Psychological Society.

I will leave the scientific analysis to Dr. Goldstein and the Australian Government's study, also attached as an Appendix. But I want to make a few general points.

• *Australian Research*

Let me turn here to the Australian study. This study updated a 1995 study conducted by Kevin Durkin, Ph.D., Associate Professor of Psychology, University of Western Australia. In that study, which reviewed all literature on the effects of video games on users, Durkin concluded, "Overall, evidence is limited, but so far does not lend strong support to the claims that computer games play promotes aggressive behavior."

As noted earlier, the new study reaches much the same conclusion after evaluating research carried out since the 1995 study was published.

A few key points from the Australia study are worth reporting. First, government researchers found in a national survey that "most people associate positive feelings such as enjoyment, happiness, exhilaration, relaxation, and challenge with playing computer games": and that "young players report that aggressive content is not the central attraction of games. Many players said that they perceive the aggressive content as fantastic and preposterous, with the result that they do not take it seriously; they do not perceive their own actions as harming others since they do not believe the characters are real or suffer pain." This punctures the oft-repeated statement that kids prefer violent games or that they take them seriously.

I want to cite briefly a few important studies covered by the Australians. Derek Scott, as reported in the Journal of Psychology, had hypothesized that the more aggressive games subjects played, the more aggressive they would become. He set out to prove this point of view, and failed. In fact, Scott found that the moderately aggressive games substantially decreased feelings of aggression, whereas the highly aggressive game resulted in no more of an increase in aggression than the non aggressive game. "Results are discussed in terms of a general lack of support for the commonly held view that playing aggressive computer games causes an individual to feel more aggressive," Scott wrote. There are several other studies which have sought to prove that the more aggressive the game played, the more significant the impact on behavior, and the have not been able to demonstrate this link, suggesting that there is not nexus between the level of aggression in a game and behavior outside it.

The Australian authors also note a 1997 study by Dutch researchers Van Schie and Wiegman who believed that the more users were exposed to violent games, the more aggressively they would behave. In fact, they reported, no relationship was found between the amount of play and aggressiveness.

In sum, the Australian Government study concludes that, "Despite several attempts to find effects of aggressive content in either experimental studies or field studies, at best only weak and ambiguous evidence has emerged."

• *Research Methodology*

In evaluating any research on this topic, pro or con, it is important to carefully evaluate the methodology, definitions, and interpretation of the data. In this regard, Dr. Goldstein notes: "Neither the quantity nor the quality of research on video games does much to inspire confidence in solid conclusions about their effects. Nearly every study suffers from vague definitions (of violence or aggression), ambiguous measurements (confusing aggressive play with aggressive behavior), questionable measures of aggression (such as blasts of noise or self-reports of prior aggression), or overgeneralizations of the data."

Take, for example, the issue of how aggression is defined in the studies. Psychologists define violence or aggression as "the intentional injury of another person." Yet, in video games, there is neither intent to injure nor a living victim. Nonetheless, some researchers loosely claim that the goal of certain games is to "kill" opponents. But there is no literal killing and it is a massive leap of logic to suggest that vaporizing an animated character leads to or causes real world killing.

Another flaw in some research on this topic lies in how the research is carried out. Many of them, for example, are conducted in lab settings which do not replicate even remotely the environment and experience of those who play games for entertainment.

Dr. Goldstein writes: "Experiments that claim to study the effects of playing electronic games rarely study play at all. In reality, a game player chooses when and what to play, and enters in a different frame of mind than someone who is required to 'play' on demand. Some have argued that the link between media violence and aggressive behavior is as strong as the link between cigarette smoking and cancer. This is not so. We can measure the presence or absence of disease with reasonable precision, but we cannot easily or reliably measure aggressive behavior in laboratory settings. We have only indirect and often questionable measures of aggression at our disposal."

It is true that some research, including some you may hear about today, claims that video games lead to aggressive behavior in the real world. But often these are conclusions and speculation not supported by the underlying research. It is argued, for example, that video games reinforce murderous behavior! Last time I checked, murder was the taking of a human being's life. Equating that to shooting alien creatures is totally unsubstantiated, and requires one to assume that the player will believe that what is permitted in the fantasy world he or she voluntarily entered is sanctioned in real life.

In fact, rather than suggesting that playing violent games leads to aggressive behavior in the real world, at best there is some weak evidence that this activity may lead to more aggressive play. In 1999, British researcher Mark Griffiths reviewed the literature on the subject and noted that what some researchers report as aggressive behavior is really only an increase in aggressive play—such as mock battles or running around making believe you're killing aliens—with no intent to injure, as required by the standard psychological definition of aggression. This point cannot be overemphasized. There is a world of difference between running around making believe you're killing aliens, or martial arts play fighting, and picking up a real weapon and shooting your friends. *There is not a shred of evidence in the academic lit-*

*erature to support the allegation that a violent video game leads to aggressive behavior in real life.*

Some researchers do claim that they have established a link between playing a violent game and aggressive behavior, such as Anderson and Dill. But their measure of aggressive behavior is not evidence of an actual violent act or the actual intent to injure someone, but the intensity and duration of noise blasts initiated by their subjects. I am not a psychologist but I would suggest that basing a conclusion that violent games lead to aggressive behavior on how loud and long someone blows a horn is not a sound basis for policy or pronouncements. Another measure used in this research is reaction time to aggressive words flashed on a screen after playing a violent game. A faster response was presumed to indicate aggressive thoughts. But it means nothing of the sort, anymore than if one played a golf game and then responded faster to the word "putter" means that you have golf on the brain. This kind of weak data represents the high water mark for research seeking to establish that violent video games lead to aggressive behavior, and it is extremely weak and ambiguous at best, and is contradicted by other research.

Yet another weakness in some of the research is that it fails to control for the pre-existing tendencies that subjects bring into the research. Griffiths points out that more aggressive children may be drawn to more violent games. And the Australian authors suggest that "it would appear plausible that the direction of effect is from player to game. Computer games cannot turn players into boys. A more reasonable interpretation is that people with certain characteristics seek out certain types of games. It remains uncertain whether involvement in aggressive games by already aggressive individuals contributes to the exacerbation of their aggressive tendencies, provides a harmless avenue for its discharge, or makes no difference."

**Television vs. Interactive Entertainment**

Another statement often made about video games is that one can extrapolate the effects of television research to computer games. This is not only bad science, it may be wildly misleading. One difference between video games and TV is that video game players exert control over what takes place on the screen. They are participants in an interactive system that allows them to regulate the pace and character of the game. This, in turn, gives them increased control over their own emotional states during play. A substantial body of research demonstrates that perceived control over events reduces their emotional or stressful impact.

**Military Simulators**

Over the last year, much attention has been paid in Congress and the media to claims that the military's use of video game technology in training suggests that these games when used in the home train kids to kill. There is no evidence to support this wild claim, the purveyor of it has absolutely no research on which the claim is based, and the Pentagon itself dismisses the notion that it uses simulators to teach soldiers to kill. I will not dwell on this issue here, but will be happy to provide detail on this claim should the Committee desire.

**Proactive Steps by the Video and Computer Game Industry**

Does this mean we do nothing? The answer is no. Last Spring, I testified before this Committee and pledged to take a series of steps to address concerns about violent video games, including stepping up promotion of the ESRB, working with retailers to uphold the ratings at the point of sale, and addressing concerns about video game advertising. We have redeemed all of these pledged.

Our industry has been and continues to be extremely proactive in addressing concerns about the content of the small minority of products which give rise to the concerns covered in this hearing. We agree that some games are not appropriate for young children. That's precisely what the ESRB ratings tell consumers. The single most meaningful step industry and government can take to protect children from games that may not be appropriate for them is to educate parents about how to use ESRB ratings.

To that end, the ESRB mounted a major campaign last holiday season to raise awareness and use of its ratings. This campaign included paid ads in national publications with significant parent readership. It also included a PSA featuring golf superstar Tiger Woods encouraging parents to "Check the Ratings" before buying games for their kids. ESRB also reached out to various national groups such as the PTA, Mothers Against Violence in America, and the YMCA and YWCA to distribute information about ESRB ratings to their constituents.

Another major element of the effort was to encourage retailers to carry information about ESRB ratings in their stores, and to adopt policies to uphold the ratings at the point of sale by not selling Mature or Adult Only games to persons under 17. Such national chains as Toys 'R Us, Babbages, Electronics Boutique, and

Funcoland all agreed to either actively restrict sales of "M" rated games to persons under 17 or to use their best efforts to prevent such sales. In addition, the ESRB printed and distributed over 5 million brochures on how to use ESRB ratings to retailers.

Separately, the three major video game console hardware companies—Nintendo, Sega, and Sony—all agreed this Fall to include in their hardware packages information on the ESRB, a step which put critical ratings information into the hands of millions of new consumers this holiday season.

IDSA was active in other areas as well. This Fall, our Board of Directors created a new Advertising Review Council within the independent ESRB organization to develop and enforce an expanded advertising Code which for the first time includes content standards and various restrictions on the placement of ads for video and PC games. The new ARC opened its doors for business February 1. The ARC has secured support for its content guidelines from the three major video game magazine chains who have agreed to adopt the ARC code as their internal standards and practices.

We're also pleased that the ESRB reached an agreement late last year with AOL in which AOL will adopt the ESRB ratings on its game service, a major step toward expanding ESRB's Internet presence.

We also welcome the study by the Surgeon General of the United States into the causes of youth violence, and will cooperate with that office as it proceeds.

Late last year, the IDSA conducted research asking parents who is responsible for controlling the video games children play. The overwhelming majority of respondents said it is up to the parents. Our industry will continue to make products that appeal to people of all tastes and interests. Some of these will not be appropriate for younger consumers. But absent unconstitutional restrictions on content, and absent any compelling scientific research showing that playing violent games is harmful, the best way to ensure that kids don't play games that are not suitable for them is to maximize parental awareness and use of the existing rating system. Our industry pledges to you that we will continue to actively promote the ESRB system to increase its utilization by parents, and we hope you and others who share your concerns will join us in that ongoing campaign.

**Conclusion**

While the subject of this hearing is the effects of violent interactive games on children, I want to briefly point out that there is a growing body of evidence that video games have many positive effects on players, including enhancing educational performance, improving spatial skills, improving cognitive development, and as therapeutic tools to treat attention deficit disorders, among other things. I hope we can address these benefits at some future hearing rather than continually and exclusively focusing on the issue of violence.

You will hear from witnesses who have generally expressed concern about the effects of interactive entertainment on children. We did provide the Committee with the names of other experts who do not share these views, and we were disappointed that none of them were asked to appear, or that the Committee did not seek out those with different views on its own. For this reason, we have included two additional submissions which evaluate all of the current research on the topic and reach the conclusion that there is no compelling research which supports the belief that playing violent video games in the real world causes aggressive behavior in the real world. Put another way, there is no scientific basis to argue that entering the fantasy world of Doom in the home using a mouse causes players to gun down their friends in the school yard.

But even if one were to agree with those who believe there is cause for concern about the effects of violent entertainment on children, the question is what can be done about it? Video games and computer games are protected forms of expression under our Constitution. Some may not like particular games, but the case law is clear that efforts by government to regulate violent content is unconstitutional. For this reason, I appreciate the fact that Senator Brownback has publicly said that this hearing is not for the purpose of pursuing legislation to regulate the video game or entertainment industries. Thank you.

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PREPARED STATEMENT OF JEFFREY GOLDSTEIN, PH.D., DEPARTMENT OF SOCIAL AND ORGANIZATIONAL PSYCHOLOGY, UNIVERSITY OF UTRECHT, THE NETHERLANDS

My name is Jeffrey Goldstein. I received a PhD in psychology from Ohio State University, following which I was professor of psychology at Temple University (Philadelphia) for nearly 20 years. Since 1992 I have been with the Department of

Social and Organizational Psychology at the University of Utrecht, in the Netherlands. Among the books I have written or edited are *Sports, Games and Play* (Lawrence Erlbaum Associates), *Aggression and Crimes of Violence* (Oxford University Press), *Toys, Play and Child Development* (Cambridge University Press), and in 1998, *Why We Watch: The Attractions of Violent Entertainment* (Oxford University Press). I am a Fellow of both the American Psychological Association and the American Psychological Society. I serve on the academic advisory committee of the Entertainment Software Rating Board (New York), which developed a widely used system for rating video and online games.

This overview of research on the effects of electronic games was prepared at the request of the Interactive Digital Software Association (Washington, D.C.), for whom I regularly review research on this subject. I have read nearly all the published English-language research on electronic games, which includes video and computer games, CD–ROM and online games. Neither the quantity nor the quality of research on video games does much to inspire confidence in solid conclusions about their effects. Nearly every study suffers from unclear definitions (of violence or aggression), ambiguous measurements (confusing aggressive play with aggressive behavior, or using questionable measures of aggression, such as blasts of noise or self-reports of prior aggression), and overgeneralizations from the data. Experiments that claim to study the effects of playing electronic games rarely study play at all. In reality, a game player chooses when and what to play, and enters in a different frame of mind than someone who is required to 'play' on demand.

Some have argued that the link between media violence and aggressive behavior is as strong as the link between cigarette smoking and cancer. This is not so. We can measure the presence or absence of disease with reasonable precision, but we cannot easily or reliably measure aggressive behavior in laboratory settings. We have only indirect and often questionable measures of aggression at our disposal.

**Research on Electronic Games**

There are 4 types of research on electronic games: 1) Demographic surveys describe who plays which games. 2) Correlational studies examine the relationship between video game play and other behaviors, such as aggression or school performance. 3) Experiments seek to establish cause-and-effect relationships by requiring some individuals to play video games and others to play other (or no) games. Measurements are then taken to establish the effects of video games. 4) Applied research uses electronic games as a medium for education, training, medicine, and therapy.

**The file drawer problem**

Published research in scholarly journals does not represent all the research on electronic games. Studies that fail to find statistically significant results are less likely to be accepted for publication. So the published record is an unknown fraction of all research, and it tends to consist of those studies with statistically significant results. This is known as 'the file drawer problem' because studies that do not find any effects of video games remain unpublished, locked away in the researcher's files.

**Surveys**

Industry people can provide demographics of games players of the growth of electronic games from a youth activity to one that cuts across all ages and both sexes. Research by social scientists tends to focus on potential problem areas, such as video game 'addiction' or the relationship between the extent of gaming and school performance. Concerns about addiction to video games have lately given way to concerns about internet addiction (Kraut, et al. 1998).

Studies that consider addiction to video games offer snapshots in time rather than dynamic pictures of play over a period of weeks or months. At any given moment, there are players deeply immersed in the gaming experience, but this obsession is temporary, according to a large-scale Australian survey (Durkin 1998).

Barrie Gunter (1998) concludes in his review of video game research, "There is international evidence that video games do not preoccupy children and teenagers to the exclusion of other pursuits. . . . Some children may admit to playing more than they think they should, but few signs have emerged so far that video game addiction is a growing social problem. Video game players do not differ significantly from non-players in terms of other activities, including sports."

**Correlates of Violent Video Game Play**

Some studies compare the most frequent players of electronic games with those who play less often (for example, Anderson & Dill in press; Griffiths & Hunt 1998; Roe & Muijs 1998). In some studies, frequent play with violent video games is correlated with lower school performance, more aggression, delinquency, and behavioral and emotional problems. The heaviest users of video game are males, and

those who prefer violent video games are most likely to be above average in aggression, and to show other characteristics of aggressive men: namely, poorer school performance, less interest in bookish activities, more delinquency, and so on. These correlations do not imply causality. According to one study (Roe & Muijs 1998), poor performance in school motivates some boys to achieve success in the world of video games. Following are descriptions of recent correlational studies of violent electronic games.

Jeanne B. Funk and her colleagues (1999) claimed to examine whether a preference for violent electronic games is "associated with an increase in problem behaviors" in adolescents. Boys and girls at a middle school and at a school for children with behavioral problems completed questionnaires about their video game experience and problem behaviors. The children were divided in half according to whether they played video games "high in violence" or "low in violence." For girls, playing violent video games was not associated with any clinical problems. Those who played violent video games scored higher on something called "thought problems," but this is not further defined or described. Boys who played video games low in violence had *higher* delinquency scores than boys who played more violent video games! Other studies also fail to find that higher levels of violence in video games has stronger effects than lower levels of violence (for example, Anderson & Ford, 1986).

*Comments on the Funk et al. study*

The study cannot possibly show whether violent electronic games are related to an increase in adolescent problems because it does not measure changes in problem behaviors. It is a static study that measures self-reports of play with violent games and self-reported problem behaviors at one point in time. The study did not find more violent video game playing among children at the school for adolescents with behavior problems. Suppose instead of finding very little, Funk et al. had found that those who played violent electronic games had more behavior problem behaviors. What would that tell us about violent electronic games? It would not imply that games *cause* these problems. Some youngsters with problems may use video games as a way of *coping* with problems. There is no way to draw sound conclusions from such a study.

Craig Anderson and Karen Dill (in press) conducted a study on the correlates of experience with violent video games. Seventy-eight men and 149 women undergraduates at a midwestern university completed questionnaires about their exposure to video game violence and paper-and-pencil measures of delinquency, aggression, irritability, world view, and grade point average. The university students indicated their favorite games, and were asked to recall how often they played video games in recent months, during the 11th and 12th grades, during the 9th and 10th grades, and during the 7th and 8th grades. Also measured were perceptions of crime and feelings of safety.

*Results.* As in some previous research, Anderson and Dill found a positive correlation between experience with violent video games and measures of aggression and delinquency. This does not mean that the former is a cause of the latter. Highly aggressive youngsters are attracted to violent video games (Goldstein, 1998). Both aggression/delinquency and involvement with violent video games may be the result of other factors, such as a high need for arousal, excitement, or attention. Perception of crime was not significantly related to play with violent video games. George Gerbner and others found that people with the most exposure to television overestimate crime rates. Anderson and Dill did not find that here; experience with violent video games was not related to perception of crime.

Anderson and Dill write of their data as though they are describing a causal sequence. "The positive association between violent video games and aggressive personality is consistent with a developmental model in which extensive exposure to violent video games (and other violent media) *contributes to* the creation of an aggressive personality." In sum, Study 1 indicates that concern about the deleterious *effects* of violent video games on delinquent behavior, aggressive and nonaggressive, is legitimate," write Anderson and Dill. But their study has nothing to do with the effects of video games, deleterious or otherwise [emphasis added]. Correlation is not causality, no matter how tempted one may be to argue otherwise. The authors acknowledge this when they write, "However, the correlational nature of Study 1 means that causal statements *are risky at best*. It could be that the obtained video game violence links to aggressive and nonaggressive delinquency are wholly due to the fact that highly aggressive individuals are especially attracted to violent video games."

**Experiments with Violent Video Games**

Much of what is written about video games with violent themes assumes that the media (including electronic games) affect vulnerable groups of people in ways that go against their grain, a 'magic ray' approach to the media. In contrast, I believe that people are extremely selective in the media they use and attend to, and that the effects the media have on them are pretty much the effects that the user is seeking.

*Physiological reactions to video games*

Electronic games are challenging, sometimes frustrating, exciting, surprising, and often funny. While playing, individuals may experience a range of emotions accompanied by physiological changes. In one study with university students, heart rate accelerated while playing a violent video game, and returned to baseline within 15 minutes following play (Griffiths & Dancaster 1995).

Winning a competitive video game did not result in a rise in testosterone level, as happens with the victors of competitive sports and chess matches (Mazur, et al., 1997). This may be because players do not regard video games as truly competitive, but see video game play instead as a cooperative activity.

Positron emission tomography (PET) scans were taken while healthy men played a video game. The neurotransmitter Dopamine, thought to be involved in learning, reinforcement of behavior, attention, and sensorimotor coordination, was released in the brain during play (Koepp 1998).

*Violence and 'violence'—Matters of definition*

When people refer to "violence in the media" or "violent video games" they rarely distinguish between real violence—people hurting one another as in warfare or a slap in the face—and symbolic or fantasy violence, in which characters engage in mock battle. Nor do they distinguish between cartoon characters, fantasy figures in electronic games, dramatic violence portrayed by human actors, and real violence in news and documentary programs. Psychologists define violence or aggression as "the intentional injury of another person." However, there is neither intent to injure nor a living victim in an electronic game. Anderson and Dill (in press) write that "the goal of the player in Mortal Kombat is to kill any opponent he faces." But there is no literal killing here; something else is going on, namely, play and fantasy. When discussing "violence in the media" people do not usually mean literal violence.

An article by Dill and Dill (1998) further illustrates this confusion. They write, "If violent video game play indeed depicts victims as deserving attacks, and if these video games tend to portray other humans as 'targets,' then reduced empathy is likely to be a consequence of violent video game play, thus putting the player at risk for becoming a more violent individual." The Dills write that perhaps video games would have stronger effects than television because of the active involvement of players. They argue that players must "act aggressively" and are then reinforced for this "aggression." "In violent video games, aggression is often the main goal, and killing adversaries means winning the game and reaping the benefits. While in real life, murder is a crime, in a violent video game, murder is the most reinforced behavior. . . . The violent video game player is an active aggressor" according to the Dills, and "the players' behavioral repertoire is expanded to include new and varied aggressive alternatives."

Likewise, Anderson and Dill (in press) write, "Each time people play violent video games, they rehearse aggressive scripts which teach and reinforce vigilance for enemies, aggressive action against others, expectations that others will behave aggressively, positive attitudes towards use of violence, and beliefs that violent solutions are effective and appropriate. Furthermore, repeated exposure to graphic scenes of violence is likely to be desensitizing. . . . Long-term video game players can become more aggressive in outlook, perceptual biases, attitudes, beliefs, and behavior than they were before the repeated exposure. . . ." To my knowledge, there are no studies of the long-term effects of video games. There is no evidence that video games actually have any of these effects.

*Effects of violent video games*

Lt. Col. Dave Grossman (1995; 1999) has stressed the similarities between combat training and violent video games. He could just as logically have stressed their differences. Among the differences between training soldiers for combat and playing video games are:

- The motivations for undertaking the tasks are different.
- The individual can play or not, and can come and go, as he pleases.
- The intentions of the players are different.
- The players' beliefs about what they are doing and why differ.

- There are many cues in video games that 'this is play' (for example, sound effects, fantasy figures, scorekeeping).
- The behaviors reinforced (play vs. aggression) and the reinforcements themselves are different.
- The social relationships among the individuals involved are different.

Experiments on the effects of violent video games on the behavior of elementary school children typically fail to distinguish between *aggressive play* and *aggressive behavior*. After playing a Mortal Kombat-style video game, children, boys especially, are likely to engage in martial arts play-fighting. To many adult observers, the boys are thought to be acting aggressively, but in fact are engaged in aggressive *play*, where there is no intent to injure anyone (Silvern & Williamson 1987). Media violence research is clouded by such ambiguities.

According to British psychologist Mark Griffiths (1999) "the majority of studies on very young children tend to show that children become more aggressive after playing or watching a violent video game, but these were all based on the observation of free play." This is precisely the problem, confusing aggressive play with aggressive behavior, that leads to fuzzy conclusions. In the rare study that measures both aggressive play and aggressive behavior (for instance, Cooper & Mackie 1986; Hellendoorn & Harinck 1998), violent games affect the former but do not affect aggressive behavior.

In part because of these ambiguities, those who review the existing research on violent video games arrive at different conclusions. Among recent reviews, some conclude that violent video games are a cause of violent behavior (Anderson & Dill in press; Ballard & Lineberger 1999; Dill & Dill 1998), while others conclude that there is insufficient evidence to draw any conclusion (Australia 1999; Durkin 1995; Gunter 1998; Griffiths 1999). Anderson & Dill review published studies on video games and aggressive behavior, and conclude as have others, that every study suffers from flaws in methodology, ambiguous definitions, is open to alternative explanations, or results in inconsistent findings. "In sum," they write, "there is little experimental evidence that the violent content of violent video games can increase aggression in the immediate situation."

*Anderson and Dill experiment*

In an experiment by Anderson and Dill (in press), students played a violent video game (Wolfenstein 3D) or a nonviolent game (Myst) that were similar in their degree of difficulty, enjoyment, and frustration (although men considered Wolfenstein 3D more exciting than Myst). One hundred four women and 106 men from a midwestern U.S. university visited the laboratory twice, playing each assigned video game 3 times for 15 minutes per time. In the first session participants played the game, completed the affective and world view measures, and played the game again, then completed the cognitive measure. The cognitive measure of aggressive thoughts was the time it took to recognize aggressive words (for example, 'murder') flashed on a computer screen. Aggressive thoughts were not measured directly in this experiment, only reaction time to words flashed on a screen.

During the 2nd session, particiants played the game again for 15 minutes and completed the behavioral aggression measure. Aggressive behavior was measured during a 'competitive reaction time task,' in which the participant is told to push a button faster than an opponent. If participants lose this race, they receive a noise blast at a level supposedly set by their opponent. As their measure of aggressive behavior Anderson and Dill use the *intensity and duration of noise blasts* the participant chooses to deliver to the opponent. They write that this is "a widely used and externally valid measure of aggressive behavior," but this is open to doubt because there is nothing in this method nor in the instructions to the participants to indicate that there was any *intention to injure* anyone in this situation.

*Results:* Greater exposure to violent video games predicted greater aggressive behavior, particularly among those who were high in aggressiveness to begin with, and this was especially the case with men. The effect of violent video games was no different from that of nonviolent games on state hostility, or on crime perception or feelings of safety. The average reaction time to aggressive words was faster among those who had played the violent video game. The researchers interpret this to mean "the violent video game primed aggressive thoughts. This result suggests one potential way in which playing violent video games might increase aggressive behavior, by priming aggressive knowledge structures." [Does reacting quickly to aggressive words indicate aggressive thoughts?]

There were "absolutely no statistically significant effects of any of the independent variables—sex, trait irritability, video game type—on either the win or lose noise intensity settings." Participants who had played Wolfenstein 3D delivered significantly longer noise blasts after lose trials than those who played the nonviolent

game Myst. "Playing a violent video game increased the aggressiveness of participants after they had been provoked by their opponent's noise blast."

Anderson and Dill write, "The present research demonstrated that in both a correlational investigation using self-reports of real world aggressive behaviors and an experimental investigation using a standard, objective laboratory measure of aggression, violent video game play was positively related to increases in aggressive behavior. . . . The convergence of findings across such disparate methods lends considerable strength to the main hypothesis that exposure to violent video games can increase aggressive behavior . . . *The present results confirm that parents, educators, and society in general should be concerned about the prevalence of violent video games in modern society, especially given recent advances in the realism of video game violence.* . . . The results of the current investigation suggest that short-term video game violence effects may operate primarily through the cognitive, and not the affective route to aggressive behavior . . . Thus, the danger in exposure to violent video games seems to be in the ideas they teach and not primarily in the emotions they incite in the player. *The more realistic the violence, the more the player identifies with the aggressor. The more rewarding the video game, the greater potential for learning aggressive solutions to conflict situations."* [emphasis added]

*Comments on the Anderson and Dill experiment.*

Can one generalize from the Anderson and Dill studies to real-world video game players? Do their results justify the need to "be concerned about the prevalence of violent video games," and their increasing realism? Their studies do not address the realism of video games, or identification, or the effects of rewards, or attitudes toward conflict resolution. Do more realistic games have greater impact? Do players really learn that aggression is the solution to conflict? We do not know.

There is no sense in which the participants in this experiment *played* a video game, violent or otherwise. They were instructed to play a video game for a few minutes. Whatever effects are found may not generalize to the natural play setting in which real gaming takes place. Playing a game at the urging of an experimenter does not resemble the world of play. Almost no studies of the presumed harmful effects of video games have considered how and why people play them, or play at all.

No evidence is given that reaction time to aggressive words is a valid measure of aggressive thoughts, or that noise blasts are intended to injure another person.

Real acts of violence have been modeled on media images. The media may give *form* to aggressive behavior. But I am aware of no evidence that the media *motivate* individuals to commit aggression if they are not otherwise inclined to do so.

**The Attractions of Violent Entertainment**

Some critics condemn the makers of violent entertainment for marketing 'violence for violence sake' (Grossman 1995, 1999). But that is not what people seek. People are highly selective in the violence they seek or tolerate. Violence, if it is to be entertaining, must fulfill certain requirements: it must have a moral story in which good triumphs over evil, and it must carry cues to its unreality—music, sound effects, editing, a fantasy story-line, cartoon-like characters.

*The audience for violent entertainment*

Many who condemn violence in video games eagerly devour the latest novel by Stephen King. Men particularly like violent entertainment. For the majority of consumers, the violence is a means to ends, a device valued more for what it does than for what it is. The consumers of violent entertainment do not share a single motive. Some play violent video games to experience excitement, some to become experts and impress their friends, others because the games are challenging. Some young people play widely vilified games in order to elicit predictable, if negative, reactions from teachers, parents, or girls. Immersion in a fantasy world is also conducive to the pleasant transcendental experience known as "flow" (Csikszentmihalyi 1990).

People can choose the degree of emotional content with which they are most comfortable, just as they do when selecting music to listen to. An undeniable characteristic of violent imagery is its emotional wallop; it gives most people a jolt. Not everyone finds this kind of stimulation pleasant, but some do. Even if players find the violence repugnant, they can fine-tune their involvement in the game by focusing on its' graphics, technique, or on their score, in order to control their emotional involvement.

Youngsters are willing to expose themselves to unpleasant images because the benefits of doing so outweigh the costs. Players, like media researchers, have overriding reasons for engaging with violent themes.

*Social identity*

Violent entertainment appeals primarily to males, and it appeals to them mostly in groups. These are social occasions, particularly suitable for 'male bonding' and communicating a masculine identity. Boys may play violent video games alone in their rooms, but they are almost certain to talk about them with their friends. In a survey of Canadian youth, Stephen Kline (1999) observes, "For many of the male gamers, video gaming was part of a network of friendships and social affiliations making gaming into a cool thing."

*The importance of context*

Both the context of violent images and the circumstances in which they are consumed play a crucial role in their appeal, and probably in their effects. In order to experience pleasure from exposure to violent images players must feel relatively safe in their surroundings. Furthermore, there must be cues that the violent images are produced for purposes of entertainment and consumption. Bloody images lose their appeal when there are few cues to their unreality (McCauley 1998). If the violent imagery does not itself reveal its unreality, the physical environment may do so. We are aware of holding a joystick or remote control, of playing a game on a console or computer screen. Without background music, special effects, or fantasy characters, images of violence are unattractive.

**Electronic Games in Education, Therapy, and Science**

In her book Playing with Power, Marsha Kinder (1991) notes that video games 'have considerable educational and therapeutic value for a diverse range of groups—including adolescents, athletes, would-be pilots, the elderly in old-age homes, cancer patients undergoing chemotherapy, stroke victims, quadriplegics, and young children suffering from palsy, brain damage, and Down's syndrome.'

Electronic games are used to teach and reinforce skills in education, science and medicine. Games are used increasingly to study learning (Blumberg 1998; Rieber 1996), memory (Shewokis 1997), motivation (Wong 1996), cognitive processes (Kappas 1999), attention and attention deficits (Pope 1996), and spatial abilities (Subrahmanyam & Greenfield 1998; Tkacz 1998). Electronic games have been developed to teach safe sexual practices to adolescents, and to help diabetic children better manage their illness (Lieberman 1998).

Sometimes the hardware is of interest. Commercial electronic games have much to recommend them as psychological tests. The equipment is robust, inexpensive, small, light and portable, scoring is completely objective and the rules for any given game are the same for every player. An American mountaineering expedition to the 7,700 meter high Tirich Mir used two games to measure performance, Simon Says to measure short-term memory, and Split Second to measure pattern recognition and reaction time. The games operated normally even at 7,000 meters under the extreme conditions of the climb (but the batteries had to be warmed by the climbers). "What seems beyond doubt is the possibility of testing performance under extreme conditions by means of electronic games" (Jones 1984).

*Spatial abilities*

Video games are among the most successful means of reducing the traditional sex difference in spatial abilities (Subrahmanyam & Greenfield 1994).

*Video Games in Therapy*

Attention deficit/hyperactivity disorder is characterized by the inability to sustain attention long enough to perform activities such as schoolwork or organized play. Treatments include brainwave biofeedback training, in which systems feed back information to trainees showing how well they are producing the brainwave patterns that indicate attention. Pope and Bogart (1996) developed a video game that expands this concept by becoming more difficult as the player's brainwaves indicate that attention is waning. The trainee can succeed at the game only by maintaining an adequate level of attention.

*Video Games and the Elderly*

Electronic games can speed reaction times, hone cognitive skills, and may retard memory decline among the elderly (Drew & Waters 1986; Dustman 1992; Goldstein 1997).

**What's Missing from Games Research?**

The motivation to play is powerful. In seeking a site for a research project, I visited rehabilitation centers for people with severe handicaps. In nearly all of them, people were playing computer or video games, one man with his feet because he did not have the use of his arms, and one woman who had no movement in her arms

or legs played by blowing through a straw. It is precisely this spirit of play that is missing from psychological experiments of video games.

Young people bring their entertainment choices and experiences to bear on their intense concerns with questions of identity, belonging, and independence. Much of their public behavior—the clothes they wear, the music they listen to, and the games they play—has a social purpose. How else are we to understand the fads of body piercing and tattooing, or the popularity of horror films or violent video games, except in reference to peer groups? Until researchers look, not at isolated individuals forced to play a video game for a few minutes as part of a laboratory experiment, but at game players as members of extended social groups, we are unlikely to come to terms with violent, or any other, entertainment.

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The Australian Study has been retained in the Committee files.

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PREPARED STATEMENT OF THE VIDEO SOFTWARE DEALERS ASSOCIATION

Mr. Chairman,

Thank you for allowing the Video Software Dealers Association (VSDA) to submit a statement for the record at the hearing on the impact of interactive violence on children.

We want to assure the committee that VSDA and our members are concerned about the level of youth violence in our society. While we have no expertise in the relationship between video game violence and youth violence, the home video industry believes we have a role to play in helping parents ensure that their children do not gain access to video games that the parents deem inappropriate for them. We want to share with you the actions we have taken to assist parents in this regard and enlist your involvement in this effort.

Established in 1981, the Video Software Dealers Association is a not-for-profit international trade association for the $17 billion home entertainment industry. VSDA represents over 3,000 companies throughout the United States, Canada, and 22 other countries. Membership comprises the full spectrum of video retailers (both independents and large chains), as well as the home video divisions of all major and independent motion picture studios, video game and multimedia producers, and

other related businesses that constitute and support the home video entertainment industry.

Video game sales and rentals are an important and increasing segment of the home video industry. In 1998, the domestic home video game market generated about $2.7 billion in software sales and about $800 million in rental revenue.

The members of VSDA agree with the premise that the best control is parental control. As stated in the final report of the Congressional Bipartisan Working Group on Youth Violence, which was issued two weeks ago, "[p]arents and other adults responsible for the development of children should be vigilant about protecting them from exposure to inappropriate programming." There is no better place than in a home video store for parents to control the content of the video games and movies to which their children have access. For this reason, VSDA-member retailers have taken action to aid parents in making more-informed entertainment choices for their families. We do this through a program we call "Pledge to Parents."

The centerpiece of Pledge to Parents, established by VSDA in 1991, is a commitment by participating retailers:

1. Not to rent or sell videotapes or video games designated as "restricted" to persons under 17 without parental consent, including all movies rated "R" by the Motion Picture Association of America and all video games rated "M" by the Entertainment Software Rating Board.
2. Not to rent or sell videotapes rated "NC–17" by the Motion Picture Association of America or video games rated "Adults Only" by the Entertainment Software Rating Board to persons aged 17 or under.

In addition, as part of the Pledge to Parents program, many retailers solicit from customers written instructions regarding what types of video games and movies can be rented or purchased by family members. For instance, a customer can limit all of his or her children, regardless of age, to videos rated "E" (Everyone: content suitable for age six and older) by the Entertainment Software Rating Board, or indicate that one child is permitted to rent "E" games while another can rent "T" (Teen: content suitable for age 13 and older). Thus, our voluntary system allows parents, if they so choose, to be even more restrictive than any industry- or government-enforced system would be.

In 1999, we updated our Pledge to Parents materials and provided the revised kit, at no cost, to each retail member of VSDA. We have also offered to provide the materials at cost to any other video retailer that requests them.

Each Pledge to Parents kit contains the following:

- *Customer Flyer and Parental Consent Form*—These materials provide information about the Pledge to Parents program and allow customers to indicate their restrictions or authorizations on video and video game rentals and sales by their family members.
- *Terminal-Topper Sign*—This sign, to be displayed near the cash register, draws customers' attention to Pledge to Parents and the retailer's ratings enforcement policy.
- *ID Check Sign*—We encourage retailers to post this sign, which indicates that IDs will be checked when appropriate, throughout their store and remind customers of the retailer's voluntary ratings enforcement policy.
- *Video Game Ratings Poster and Brochures*—The poster and brochures are designed to help customers make informed decisions concerning their children's video game rentals.
- *MPAA Theatrical-Size Ratings Poster*—This poster provides customers with movie ratings information to further assist them with their selection of movies.

We have encouraged our members to make maximum use of the Pledge to Parents materials and provide ratings and content information to customers of all ages. We also have strongly urged our members to check IDs whenever appropriate. We are pleased to report that the response to this program from our members has been extremely positive.

As part of the relaunch of Pledge to Parents, we conducted a substantial public outreach campaign that reached millions of consumers through television, radio, newspapers, and the Internet. The purpose of this campaign was to make parents aware of the resources available to them in video stores.

And we think parents are taking this message to heart. By and large, parents appear to be making good choices for their children's game playing and movie viewing. According to VSDA's VidTrac for the week ending March 12, 2000, all of the 10 top renting video games, and 21 of the top 25, were rated "E" or "T."

The voluntary Pledge to Parents program demonstrates our industry's commitment to the communities in which we live. Video stores and their employees are

part of the neighborhoods where they are located. They often know their customers by name. They know what is acceptable and what is not acceptable in their communities. They take pride in the entertainment they bring into people's homes. And they realize that their reputations and livelihoods are on the line every time they sell or rent a video game or movie. Video retailers would not put their businesses at risk by providing to children games that their parents don't want them to have.

Finally, we must keep in mind that, in addressing the issue of violence in American society, the government cannot infringe the constitutional rights of video retailers and consumers—or of parents to raise their families as they see fit. Ultimately the responsibility for raising children lies with their parents, not the government and certainly not video store clerks.

Recognizing this, the Bipartisan Working Group on Youth Violence recommended that members of Congress meet with the entertainment industry to learn more about entertainment ratings systems and how to communicate information about the ratings systems to parents. We would be pleased to work with you to implement this recommendation.

The nation's video stores are doing their part to make sure that America's children are not exposed to violent video games without their parents' consent. Home video provides parents with the greatest control of their children's electronic game playing. Voluntary programs, such as VSDA's Pledge to Parents, are the best way to help parents exercise that control.

Thank you.

# Video Games and Real-Life Aggression: A Review of the Literature

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**EXHIBIT C**

## Executive Summary

In response to a legislative request, we reviewed the research literature on the topic of the possible link between violent video games and real-life violence. We searched three computerized databases (PsycInfo, ERIC, and Medline) and identified 25 reports of scientific studies related to this topic. We divided the studies into three age groups: preschool and elementary school children; middle and high school students; and college students and young adults. We identified seven to nine studies per age group.

At present, it may be concluded that the research evidence is not supportive of a major public concern that violent video games lead to real-life violence. However, this conclusion might change as more research is conducted on more recent and increasingly violent and realistic games.

*Preschool/elementary school children.* For children about ages 4-8, we found relatively consistent evidence (three out of four studies) that playing video games with aggressive content caused an increase in aggression or aggressive play during free-play immediately after the video game play. Because of the experimental designs (providing strong evidence of causality) and the realistic outcome measure (behavioral observations during free-play), this research indicates that preschool and early elementary school children show increased aggression or aggressive play immediately after playing a video game with aggressive content. The studies did not provide evidence that harm was inflicted as a result of the aggression, or assess whether there were any long-term effects.

*Middle and high school students.* Studies of middle and high school students showed mixed results. Because of these mixed results and the weaknesses of correlational study designs in distinguishing cause and effect, this research indicates that at this time it is not known whether violent video games have detrimental, positive, or no consistent effects on aggression in this age group.

One experimental study showed no effect of playing a video game with aggressive content on subsequent aggression. Eight other studies (including five correlational, one quasi-experimental, and two descriptive studies) had varying findings. For example, among three studies examining whether more aggressive boys are more likely to prefer violent video games, one study found the predicted association, one found no association, and one found the reverse pattern, that is, boys who preferred non-violent games scored high on a measure of delinquency and boys who preferred violent games did not.

*College students and young adults.* Studies of college students and young adults showed mixed results. Out of four experimental studies of self-rated hostile mood after violent video game play, only two showed increased hostile mood. Out of four studies using other measures of hostility/aggression, only one showed an association

between hostility/aggressions and video game play. Because of these mixed results, this research indicates that at this time it is not known whether video game play affects aggression or hostility in this age group.

Major limitations of the current research include: Lack of experimental studies addressing whether playing violent video games causes increased aggressive behavior in teenagers or young adults; lack of studies addressing whether individuals with other risk factors for violence (e.g., a history of being abused) might have more negative responses to video game violence than other youth; and lack of longer term measurements of behavior in young children.

Given the ubiquity of violent video games and the findings from experimental studies indicating that playing violent video games may lead to increased aggression in young children immediately following play, we believe that additional well-designed, experimental studies are needed. New research would utilize games with levels of violence that reflect games currently available to children. We recommend that studies focus on moderate to long term effects of playing violent video games among young children. The lack of experimental studies for students in middle and high school also needs to be addressed.

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REVIEW ARTICLE

# Video Games and Real-Life Aggression: Review of the Literature

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KEY WORDS:
Adolescents
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Review

Concern about violent video games has been widely expressed [1–3]. A professor of military science has asserted that some games are "very definitely enabling violence" in a way analogous to training programs used by the military and police agencies [4, p. 315]. Also, violent video games have been suggested as a contributing factor in recent school shootings by adolescent males who played violent games [5].

However, population-level evidence suggests that between 1991 and 1997, there was a linear decrease in adolescent weapon-carrying and physical fighting [6], and this downward trend continued in 1999 [7]. Also, between 1993 and 1998 (the most recent year available), national homicide rates dropped from 2.5 to 1.5 per 100,000 for 10- to 14-year-olds and from 20.5 to 11.7 per 100,000 for 15- to 19-year-olds. During this period, video games were ubiquitous, and most games contained violence [8,9], calling into question the notion that video games have a large-scale harmful effect on youth violence. We reviewed the scientific literature to determine whether the evidence supports a public health concern that violent video games contribute to real-life aggression.

Youth violence and delinquency have been consistently associated with family factors such as child abuse and neglect, parental rejection of the child, and parental criminality and alcoholism [10]. Individual factors such as poor performance in school and on standardized tests, truancy, gang membership, and attention–deficit-hyperactivity and conduct disorders are also consistent predictors of youth violence and delinquency, although these factors may be early manifestations or "markers" rather than causes of later problem behavior.

Violent video games may be considered in the context of war play and other forms of aggressive play by youth. Societal attitudes toward aggressive play differ among adults [11]. Aggressive play differs from real aggression by the fact that it does not include an attempt to injure someone. Although opponents of aggressive play argue that such play fosters real-life violence, proponents argue that it is a natural, even inevitable, aspect of boys' play and provides an opportunity to try to come to terms with war, violence, and death [11].

Several psychological theories are relevant to the possible role of video game violence in youth aggression. J. L. Sherry [personal communication, October 25, 1999] identified six theories used to predict either increased or decreased aggression after violent video game play. First, social learning theory [12,13] suggests that at least some aggression is learned by observing, and then by imitating, a model who acts aggressively. Aggressive video game characters might serve as models for aggressive behavior. Further, rewards such as higher points and longer playing times within the game and increased status

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EXHIBIT D

accorded by peers for success at the game could provide a motivation for increased aggression by reinforcing the behavior.

Second, an arousal theory [14,15] predicts that, if the video game player has an aggressive disposition or is angered, playing an arousing video game might cause increased aggression owing to a generalized increase in energy and intensity. According to this theory, violent video games would be expected to increase aggression only in the presence of anger from some other cause.

Third, a cognitive "priming" theory and a social information-processing model [5,16–18] suggest that violent video games will activate related cognitive structures, making it more likely that other incoming information would be processed in an "aggression" framework, possibly increasing aggressive behavior. For example, someone for whom thoughts of aggression have been evoked might be more likely to interpret an ambiguous behavior as aggressive and respond accordingly.

Fourth, catharsis theory [19] suggests that violent video games can provide a safe outlet for aggressive thoughts and feelings. Fifth, drive-reduction theory suggests, similar to catharsis theory, that violent video games may be useful in managing aggression. According to this theory, highly stressed or frustrated individuals may play violent video games to reestablish emotional equilibrium through arousal or relaxation [20].

A sixth theory, the general affective aggression Model [5], integrates social learning, arousal, and cognitive processing theories and includes individual variables (such as aggressive personality) as well as situational variables (such as video game play). According to this model, whenever exposure to violent media primes aggressive thoughts, increases hostile feelings, or increases arousal, short-term increases in aggression would be expected. Long-term increases in aggression might also result if video game-playing led to changes in aggression-related knowledge structures or "scripts."

## *Methods*

### Methods Used in Identifying Relevant Studies

To access the scientific literature in June, 1999, we searched three computerized databases containing psychological (PsycInfo), educational (ERIC), and medical (MEDLINE) literature. For the PsycInfo database, the terms "video games," "computer games," "human machine systems," and "audiovisual communications media" were crossed with the terms "violence," "aggressiveness," "antisocial behavior," "hostility," and "emotional responses." For the other two databases, the terms "video games" and "computer games" were crossed with the terms "violence" and "aggression." The differences in terms reflected differences in the content and indexing terms used by the three databases.

From the database searches, from a bibliography of literature on electronic games [21], from contacts with several researchers and others interested in this area asking if they knew about unpublished studies or very recent studies, and from references from the obtained articles, we continued identifying articles through mid-2000. We selected for review those studies that examined an association between video game-playing or violent video game-playing and measures of aggressive, hostile, or antisocial behavior; personality; ideation; or mood. We included studies that measured any video game-playing, even if the studies did not measure violent games specifically, because many, if not most, popular video games include violence [9,22]. We included measures of antisocial behavior because aggression is an important component of antisocial behavior.

We did not include in our review possible effects on behaviors other than aggression (e.g., prosocial behaviors or task performance). Also, we did not include other moods or psychological states or traits (e.g., depression, anxiety, self-concept, extroversion, or neuroticism). Although we recognize that mood and psychological states are complex and that aggression may be a factor in some of the measures we excluded (e.g., depression may involve anger directed toward the self), we wanted to focus on the most direct measures of aggression possible. We did not include measures of thoughts or feelings during video game play [13,23] unless these were linked to feelings before or after play, because we were not interested in the experience of video game play per se, but rather the effect on aggression outside of the video game.

Finally, we excluded two correlational studies [24,25] because analyses did not control for gender, and it appeared that there were gender differences on both the video game-playing and aggression measures.

### Identification of Study Features

To summarize the research findings for each of the studies, we identified four features: (a) study design, (b) ages of participants, (c) the video game variable,

and (d) the type or types of measures of aggression that were used.

Study designs included: (a) experimental (participants were randomly assigned to play a violent or nonviolent video game and then an outcome related to aggression was measured), (b) quasi-experimental (a pretest–posttest design), (c) correlational (participants were asked about their video game-playing habits and about some feeling or behavior related to aggression), and (d) descriptive (participants were asked how video game play affected them).

Participants were categorized into three age groups: (a) preschool and elementary school children, (b) middle and high school students, and (c) college students and young adults. A study that included a wide age range but averaged 18–20 years was coded as college students and young adults, and a study of individuals aged 10–20 years, which did not indicate the average age, was coded as middle and high school students.

The video game variable varied depending on the study design. For experimental studies, we noted whether there was evidence that the violent video game contained significantly more violence than the nonviolent game. For correlational studies, we noted the nature of the questions about video game use (e.g., preference for violent or nonviolent games).

The measures of aggression included: (a) behavioral observations, (b) self-reports, (c) projective tests and scenarios, and (d) teacher and peer ratings. Behavioral observations included observer ratings of children during free-play on behaviors such as physical aggression (e.g., hitting or kicking), verbal aggression (e.g., teasing), and aggression against objects (e.g., hitting a punching bag). Behavioral observations generally occurred for 5–10 minutes after the end of video game play. In some studies, observers also measured the amount of time spent playing with aggressive toys as compared with nonaggressive toys. Aggressive toys included "Bobo doll" punching bags and warrior toys.

Behavioral measures also included responses on machines that participants were told would inflict harm on another individual or that the participant used to indicate the extent of punishment that should be inflicted on another individual. The machines were actually preprogrammed computers. A machine for young children had a "hurt" button and a "help" button, which participants were told would either assist a child playing a game in a next room or make the game more difficult for the (hypothetical) child by making a handle hot [26]. A machine for college students required the students to push a button faster than his or her (hypothetical) opponent. If the participant was slower, he or she received a noise blast of white noise from the opponent; if faster, he or she determined the duration of the noise blast the opponent would receive. The duration of aversive noise the participant administered was the measure of aggression [5].

Self-reports included paper-and-pencil personality tests and measures of aggressive, antisocial, or hostile behavior; questions about aggressive or antisocial behavior in real or hypothetical situations; and mood checklists in which participants checked off which of a list of adjectives described their current mood. This category also included self-reports of relaxation or pleasure associated with game play.

Projective tests included descriptions of what cartoon figures, depicted in interpersonally frustrating situations, would say, and ratings of the behaviors or feelings of individuals who were described in frustrating or potentially aggressive scenarios. It was assumed that the participants would put themselves in the position of the individual in the situation.

Teacher or peer ratings were made by teachers or peers of the participants as to their levels of aggression or antisocial behavior.

Finally, we noted any tests of whether individual-difference factors, such as gender, influenced reactions to violent video game play. In experimental studies, this notation included tests of whether some groups responded differently to video game play (e.g., whether males or females were more likely to respond aggressively to this type of play). In correlational studies, this notation included whether controlling for individual-difference variables eliminated associations that were found.

### Evaluating Results

Where possible, we evaluated results separately for each age group and outcome type, because effects might differ between age groups and because outcomes varied in seriousness (e.g., reporting negative mood versus police contacts). We evaluated the strength of the evidence that video game violence contributes to real-life aggression by using two criteria: strength of design of the available studies and consistency of findings. We also noted other strengths and limitations of the studies (e.g., whether manipulation checks were included) and commented on them in the Results section below and in the "Study Limitations" columns of Tables 1–3.

Table 1. Studies Examining the Association Between Video Game Aggression and Aggressive Thoughts or Behaviors: Preschool and Elementary School Children

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| Brusa (1987) [27] | Experimental | 16 male and 16 female 6-year-olds | Agressive game was rated in a previous study (Anderson and Ford, 1986) as containing mild aggression. Nonaggressive game was pinball. | Behavioral observations of physical and verbal aggression during free play. | No effect of aggressive versus nonaggressive video games. Boys were more aggressive than girls before video game play and reduced aggression to a level similar to girls after play. | Manipulation of video game violence may have been weak, although Anderson and Ford (1986) found increased hostile mood using this same game. |
| Cooper & Mackie (1986) [28] | Experimental | 44 boys and 40 girls in grades 4 and 5 | A high- and low-aggression video game and nonaggression pen-and-paper game. Participants rated the games in the intended order of aggression. | Choice between aggressive or nonaggressive toys during 8-min free play and aggression-measurement machine (time spent pressing buzzer indicating punishment level for imagined misbehaving child). | Girls, not boys, played more with an aggressive toy and less with a quiet toy after "aggressive" video game. No effect on aggressive behavior on aggression-measurement machine. | Weak manipulation of video game violence (relatively low violence level of "violent" game). No control for difficulty or enjoyment level: Girls reported less liking for and worse performance on the aggressive game compared with other games, providing a possible alternative explanation for results. |
| Graybill et al. (1985) [29] | Experimental | 116 children in grades 2, 4, and 6 | Boxing versus basketball; participants identified more violence in boxing. | Projective test of aggression in which participants described responses of hypothetical person in frustrating situations. | After playing aggressive game, (1) participants showed a beneficial effect of decreased blame of others and (2) nonaggressive females showed more focus on barriers causing frustration. However, (1) was not replicated and it did not appear that (2) was tested in Graybill et al. (1987). | Difficulty or enjoyment levels of violent and nonviolent games may have been different, providing a possible alternative explanation for results. Scoring of one of scales (focus on frustrating barriers) not reliable according to author. No behavioral measure of aggression. |
| Graybill et al. (1987) [26] | Experimental | 146 children in grades 2–6 | Three violent and three nonviolent games. Psychology graduate students and participants both identified more violence in the violent than nonviolent games and similar difficulty levels in the two games. | Projective test (describing responses of hypothetical person in frustrating situations); self-reports of aggressive behavior in conflict situations; and aggression -measurement machine (pressing "hurt" button believed to interfere with another child playing game). | No effect of video games. | Scoring of one of scales (regarding focus on frustrating barriers) not reliable according to author. In this study, intended to replicate Graybill et al. [29], games had similar difficulty levels. |

Table 1. (Continued)

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| Irwin & Gross (1995) [30] | Experimental | 60 boys in grade 2 | A martial arts game with physical aggression and a nonaggressive motorcycle race game. Aggressive content not rated independently. | Behavioral observations of physical and verbal aggression to others and objects during free play and in a competitive/frustrating situation; choice of aggressive or nonaggressive toys. | Aggressive video game play associated with more physical and verbal aggression to objects and more verbal aggression to another child during free play, and more physical aggression to another child during competitive/frustrating situation. No effects on toy choice. No differences between reflective and impulsive children. | Difficulty or enjoyment levels of games not controlled. Measure of impulsive/reflective characteristics of children may not have provided sensitive test of differences in responses between these two groups. |
| Kirsch (1998) [16] | Experimental | 29 boys and 23 girls in grades 3 and 4 | *Mortal Kombat II* versus basketball. Aggression levels were not independently rated, but violent game contained physical aggression and nonviolent game did not. | Participant ratings of hypothetical children who injured other children on measures of intention, feelings and extent to which they should be punished. | No consistent findings for intentions, feelings, or punishment. | |
| Lin & Lepper (1987) [33] | Correlational | 122 boys and 88 girls in grades 4–6; 189 rated by teacher | Frequency of playing video games at home and in arcades. | Teacher ratings of aggressiveness. | More aggressive boys reported more frequently playing video games in arcades but not at home. No associations found for girls. | Interpretation of difference between video arcade play and home play is not clear. Study design cannot establish causality. |
| Schutte et al. (1988) [31] | Experimental | 16 boys and 15 girls ages 5–7 | Karate versus jungle vine-swinging game. Aggression levels were not independently rated, but aggressive game included physical aggression and nonaggressive game did not. | Behavioral observations of aggressive behavior toward others and objects and toy choice (jungle swing or Bobo doll punching bag toy dressed in karate robe) during free play. | More aggressive behavior after violent video game. Also, children who played a jungle video game played more with the jungle toy; those who played a karate game more aggressive to Bobo doll. | Difficulty or enjoyment levels of aggressive and nonaggressive games not controlled. |
| Silvern & Williamson (1987) [32] | Experimental for comparison between video game and television, quasi-experimental for change in behavior after play | 14 boys and 14 girls ages 4–6 | Video game (*Space Invaders*) was described as violent, but there were no independent ratings of violence level. | Behavioral observations of physical and verbal aggression toward others, physical aggression toward objects, and fantasy aggression during free play. | More aggressive behavior after playing or observing violent game and after watching violent cartoon than at baseline. No effect on fantasy behavior. | No nonaggressive game control group. |

Table 2. Studies Examining the Association Between Video Game Aggression and Aggressive Thoughts or Behaviors: Middle and High School Students

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| Dominick (1984) [36] | Correlational | 250 students (including 44% males) in grades 11 and 12 | Time spent playing video games at home and in arcades (treated as continuous variables). | Self-reports of physical aggression, aggressive delinquency, and aggression in hypothetical situations. | No associations with playing at home. Time playing in arcades associated with aggressive delinquency for both genders and with physical aggression for girls. | Interpretation of differences between associations for home and arcade video game play is not known. Study design cannot establish causality. |
| Egli & Meyers (1984) [41] | Descriptive | 141 male and 10 female video arcade patrons, age range 10–20 yr | | Questionnaire asked whether playing video games calmed participants when upset. | Video game play rated as moderately calming. | No objective measure of calming effect. Study design cannot establish causality. |
| Funk et al. (1999) [37] | Correlational | 15 male and 17 female students in middle school (mean age, 12.6 yr; range 11–15) | Preference for violent video games. (At least half, compared with less than half, of favorite video games were violent.) | Self-reports of delinquency, aggression, and total externalizing (outward-directed) problem behaviors | Boys who reported low preference for violent video games had clinically significant elevation in delinquency, and boys who reported high preference for violent games did not. No significant differences between groups or differences on measures of aggression or total externalizing behaviors. | Study design cannot establish causality. |
| Griffiths & Hunt (1995) [42] | Descriptive | 387 adolescents (58% male and 42% female) aged 12–16 yr | | Self-reports of aggressive behavior resulting from computer game playing. | 21% of respondents "admitted to aggressive behavior as a direct result of their playing." | No objective measure of aggression after video game play. Study design cannot establish causality. |
| Kestenbaum & Weinstein (1985) [19] | Correlational | 178 male junior high school students aged 11–14 yr | Time and money spent playing video games (High-users spent at least 5 hours or $5/week on pay video games; Low- users played and spent less than this.) | Self reports of frustration tolerance and problems with police; self ratings of tension before and relaxation after playing video games | High users reported lower frustration tolerance, more trouble with police, more playing when tense and feeling more relaxed after playing. | Home video game play not measured. No objective measure of tension and relaxation. Study design cannot establish causality. |

Table 2. (Continued)

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| McClure & Mears (1986) [38] | Correlational | 290 students in grades 9–12 | Time spent playing video games (Generally, high-rate users = every day; low-rate users = once or twice a month). | Personality measure of psychopathic deviance and self-reports of being sent to principal's office or expelled and receiving speeding tickets. | High users were more likely to report being sent to principal's office but not more likely to report being expelled or to score high on personality measure. | Did not differentiate between home and arcade play. Did not control for gender. Being sent to principal's office may not have been due to aggressive behavior. Study design cannot establish causality. |
| Nelson & Carlson (1985) [35] | Quasi-experimental | 24 males aged 9–15 yr | Ratings pre- and postplaying a violent driving game. Also measured preference for violent or nonviolent games. | Self-rated hostile mood and "psychoticism" (antisocial tendencies). | No change in hostile mood after playing violent games. No associations of game preference with mood or psychoticism. | No nonviolent game for comparison of mood. |
| Rushbrook (1986) [39] | Correlational | 379 females and 304 males in grade 5, 8, and 11 | Time spent playing video games (less than 1/2 hour once a week or 1 hour very seldomly versus more than this amount). | Self-reported attitudes toward aggression and rebelliousness. | Time spent playing video games was associated with attitudes accepting of aggression for both genders and attitudes in favor of rebelliousness for girls. | Did not differentiate between home and arcade play. Study design cannot establish causality. |
| Wiegman & van Schie (1998) [40] | Correlational | 144 females and 134 males in grades 7 and 8, aged 10–14 yr | Time spent playing video games (none less than half an hour a day, or more than half an hour a day) and preference for aggressive games. Levels of aggression in video games reported by youth were rated by experts. | Peer ratings of aggressiveness. | Time spent playing video games was not associated with aggression for either gender, but boys rated as more aggressive by peers expressed more preference for aggressive games. | Did not differentiate between home and arcade play. Study design cannot establish causality. Note: an association between video game play and less prosocial behavior, which disappeared when gender was statistically controlled, was apparently due to less video game playing and more prosocial behavior by girls. |
| Winkle et al. (1987) [34] | Experimental | 28 males and 28 females in grade 8 | A very aggressive, aggressive, and nonaggressive video games and a no-game control. Aggressive content of games determined by rankings of college students. | Aggression-measurement machine (monetary deductions for mistakes in a "teacher-learner" situation). | No effect of video games on aggression-measurement machine. No differences in responses to aggressive video games by level of aggressive personality. | Aggression-measurement machine may not have been an adequate measure of aggression. Difficulty or enjoyment levels of games not controlled. |

Table 3. Studies Examining the Association Between Video Game Aggression and Aggressive Thoughts or Behaviors: College Students and Young Adults

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| Alman (1992) [46] | Experimental | 21 male and 24 female college students | Playing or observing playing of a boxing game involved punching opponent. | Self-reports of physical and verbal aggression, backing away, and positive coping in provoking situations. | No differences between playing and observing games on any of the outcome measures. | There was no nonviolent comparison game, and the players' games had less total violence (fewer overall punches)than the observers' games. |
| Anderson & Dill (2000) [5] | Study 1: Correlational | 78 male and 149 female college students | Participants reported on violence level of favorite games and on how much time they spent playing video games. | Self-reported aggressive delinquency (e.g., hitting) and nonaggressive delinquency (e.g., substance use). | Preference for violent games, but not time spent playing, was associated with both aggressive and nonaggressive delinquency. The association with aggressive delinquency was strongest for males with more aggressive/ irritable personalities. | Study design does not allow for determination of causality. Arcade and home play not differentiated. |
| | Study 2: Experimental | 106 male and 104 female college students | Violent and nonviolent games were rated by college students as different in violence and similar in difficulty, enjoyment, frustration, and action speed. Violent game rated as more exciting. | Aggression-measurement machine allowed participants to deliver punishment (blasts of white noise) to a "competitor," actually a preprogrammed computer. Reaction time for reading aggressive words compared to other words. Self-reports of hostile mood. | Individuals who played a violent game gave more punishment than those who played a nonviolent game. Also, individuals who played a violent game had relatively faster reaction times to aggressive words than those who played a nonviolent game. No differences in hostile mood. | |
| Anderson & Ford (1986) [43] | Experimental | 60 college students | Highly aggressive game rated by participants as more aggressive than mildly aggressive game, which was in turn rated above neutral point for aggression. | Self-reports of hostile mood. | Self-reports of hostile mood were higher after playing either video game than after no game. Difference between mildly and highly aggressive game was in predicted direction but not statistically significant. | Difficulty or enjoyment levels of games not controlled. |

Table 3. (Cintinued)

| Authors | Study Design | Ages and No. of Participants | Video Game Variable | Outcome Measures of Aggression | Findings | Study Limitations |
|---|---|---|---|---|---|---|
| Austin (1987) [44] | Experimental | 44 male and 58 female college students | Highly aggressive video game was rated as 8 and moderately aggressive game as 4 on a 10-point violence scale. | Self-reports of hostile mood. | No association between violence level of game and hostile mood after frustration (all participants were angered before video game play). | |
| Ballard & Wiest (1996) [15] | Experimental | 30 male college students | More/less violent versions of *Mortal Kombat*, based on manufacturer's information, and nonviolent game (billiards). | Self-report of hostile mood and two personality measures of hostility. | Dose-response relationships between violence levels of video games and hostile mood and both personality measures of hostility. | No independent rating of violence level of games. Difficulty or enjoyment levels of games not controlled. |
| Calvert & Tan (1994) [13] | Experimental | 18 male and 18 female college students | Virtual reality game involved shooting a cartoon-like opponent and a pterodactyl. Comparison conditions observed the game or moved around in way similar to movements during game play. | Self-reports of hostile mood. | No association between experimental conditions and hostile mood. | No independent rating of violence level of games. |
| Gibb et al. (1983) [47] | Correlational | 201 male and 79 female video arcade patrons; average age 18–20 yr, range 12–34 | Time spent playing video games per week and months of experience with video game play. | Personality measures of hostility-kindness and social deviancy-social conformity. | No associations between hostility or social deviancy and video game play (hours per week, or months of experience) for either males or females. | Did not report associations separately for arcade and home play, which other studies have found to be important |
| Nelson & Carlson (1985) [35] | Experimental | 48 male college students | Violent driving games involved striking others with cars; nonviolent games involved driving skill. | Self-rated hostile/ aggressive mood. | Compared with a pretest, both violent and nonviolent games increased hostile/ aggressive moods. No differences were found between aggressive and nonaggressive games. | No independent rating of violence level of games. Difficulty or enjoyment levels not controlled: nonviolent games rated as more preferred and more skill demanding than violent games. |
| Scott (1995) [45] | Experimental | 42 male and 75 female college students | Participants rated games in intended order of aggression (highly aggressive> moderately aggressive > nonaggressive). | Scores on personality measure of aggressiveness. | No dose-response relationship between aggression level of games and self-reported aggressiveness. No differences by level of antisocial personality. | Difficulty or enjoyment levels of games not controlled. |

## Results

Here we provide a summary of our findings for three age groups and, where numbers of studies were adequate, by outcome type. Detail about individual studies is provided in Tables 1–3.

### Preschool Children and Elementary School Students

We identified eight experimental studies [16,26–32] and one correlational study [33] of the youngest age group.

*Behavioral observations.* Three of four studies using behavioral observations of aggression during free-play found that violent video game play causes increased aggression or aggressive play immediately after the video game. This finding included two studies showing more aggression after an aggressive compared with a nonaggressive video game [30,31] and one study showing more aggression after exposure to either an aggressive video game or a cartoon than before such exposure, with no differences between the game and the cartoon [32]. One of those studies [30] measured aggression in a provoking situation and found increased aggression in this situation as well. The remaining study [27] did not find a difference between aggressive and nonaggressive games. In that study, boys were more aggressive than girls before playing any video game but reduced their aggression to a level similar to that of girls after the video games.

Studies of toy choice yielded inconsistent findings. One study showed that children were more likely to play with a Bobo doll dressed in a karate robe after watching a karate movie [31], one study showed increased play with aggressive toys after a violent video game for girls but not boys [28], and one study (which included only boys) did not show any significant effect of video games on choice of toys [30]. Aggression-measurement machines did not yield significant findings in either of the two studies that used these machines (e.g., children did not press the hurt button longer after playing an aggressive video), although this type of machine had yielded significant effects in research on the effects of television watching [26,28].

*Other outcome measures.* Results based on other outcome measures were mixed. Hostile attributions were significantly increased after aggressive video game play on half of the measures in one study that measured these attributions [16]. A set of two studies that used projective tests of aggression showed a beneficial effect of violent video games on less blaming of others, but this effect disappeared when controlling for difficulty levels [26,29]. In the one study that used teacher ratings, ratings of aggression for boys were related to video game play in arcades but not at home; no associations were found for girls [33].

### Middle and High School Students

We identified one experimental study [34], one study with quasi-experimental and correlational components [35], six correlational studies [19,36–40], and two descriptive studies [41,42].

*Self-reported aggression and antisocial behavior and mood.* Results of six correlational studies and one descriptive study of the possible link between self-reported video game play and aggressive behaviors or moods provided mixed results. Two of those studies examined boys' preferences for violent or nonviolent games and found either no association with antisocial behavior [35] or heightened delinquency in boys who preferred less (not more) violent games [37].

Four other studies found associations between the amount of time spent playing video games and at least one measure of self-reported aggression, but specific patterns varied. The first such study found that boys who reported more video game play in arcades but not at home also reported more aggressive delinquency [36]. A similar association for girls became nonsignificant when grades in school and time watching violent television were statistically controlled. The second study found an association of high levels of video game play with problems with police and low frustration tolerance, as well as with feeling more relaxed after play, leading that author to suggest that the games may be helpful to some youth in dealing with developmental conflicts [19]. The third study [38] found more self-reported visits to the principal's office but not more serious antisocial behavior among high video game users. That study did not control for gender, and so, if boys went to the principal's office more often, these results may have been owing to gender differences. The fourth study found that attitudes accepting of aggression were associated with more video game play for both males and females, and attitudes in favor of rebelliousness were associated with more video game play for females [39]. In addition, a descriptive study

[42] reported that 21% of respondents who played computer games indicated increased aggressive behavior owing to the games.

In addition to the finding of more relaxing effects among high video game users [19], a descriptive study reported that participants, overall, rated video game play as being calming when they were upset [41]. However, a quasi-experimental study that measured self-reported mood before and after video game play did not find a significant change in hostile or aggressive mood [35].

*Other outcome measures.* Other outcome measures showed mixed results. One study that used an aggression-measurement machine did not show an effect of video game play [34]. A study examining the correlation between self-reported time spent playing video games and peer ratings of aggressiveness found that total time spent playing video games was not correlated with aggression, but boys rated as more aggressive by their peers expressed more preference for violent games [40].

### College Students and Young Adults

We identified seven experimental studies that compared violent with nonviolent or less violent games [5,13,15,35,43–45], one study that experimentally compared playing to observing a violent game [46], and two correlational studies [5,47] in this age group.

*Self-reported aggression and antisocial behavior and mood.* Studies examining the possible effects of video games on hostile mood and other measures of aggression and hostility yielded mixed results. Of six experimental studies examining hostile mood, two showed increased hostility after violent video game play [15,43] and four did not [5,13,35,44]. One of those studies not showing a significant mood effect angered the subjects before game play [44]. Also, in that study, those individuals who reported having played video games when tense most often reported that game play made them slightly less tense, and those who reported playing when calm or relaxed most often reported that game play made them slightly less calm or relaxed, suggesting that any tension-reduction or energizing effects of game play may depend on initial mood.

Only one of four studies examining other self-reported measures of aggression and hostility revealed more aggression and hostility after violent video game play [15]. The other studies did not show an association between aggression/hostility and video game play [45–47]. One of those studies [46] compared the effects of violent video game play with watching the same game (intended to be comparable to watching television) and found that subsequent self-rated aggression was similar for the two groups. Information about the strength of the manipulations did not suggest that the manipulations were stronger in the studies showing significant effects than the other studies that did not show effects [45].

*Other outcome measures.* We found only one study that used outcome measures other than self-reports in this age group. Anderson and Dill [5] found that college students who had played a violent video game gave more punishment in the form of noise blasts to a supposed competitor (actually a preprogrammed computer) compared with students who played a nonviolent game. Also, immediately after video game play, those individuals who played a violent game processed aggressive words faster relative to other words compared with individuals who played a nonviolent game, suggesting an increased openness to aggression-related information.

### Gender Differences in Responses to Video Game Play

In addition to comparing video games with different levels of aggressive content, several studies compared males and females in their responses to video game violence. Generally, gender differences in the ability of violent video games to cause subsequent aggression were not found in experimental studies [13,16, 26–29,34,43,45]. Among correlational studies, no gender differences were reported by more than one study. If gender differences exist, they may depend on specific circumstances, such as whether participants are angered or the target of possible aggression [34].

### Other Types of Individual Differences

Several studies looked at other types of individual differences. Graybill et al. [29] differentiated more or less aggressive children, and Irwin and Gross [30] differentiated impulsive and reflective children in experimental studies without identifying consistent differences between these groups. Anderson and Dill [5] found that males who were high in aggression and irritability showed the strongest association between video game play and aggressive behavior.

### *Discussion*

Among young children (about aged 4–8 years), playing an aggressive video game caused increased aggression or aggressive play during free-play immediately after the video game in 3 of the 4 studies. For teenagers, because of the nonexperimental designs and mixed results of these studies, it was not possible to determine whether video game violence affects aggressive behavior. Among college students, there is not consistent evidence that video game play affects aggression or hostility. However, one recent study of college students showed increased aggression in a laboratory task after violent video game play [5].

### Other Reviews

We identified three other recent reviews of research on violent video games and aggression. Dill and Dill concluded that "the preponderance of the evidence from the existing literature suggests that exposure to video game violence increases aggressive behavior . . . However, the paucity of empirical data, coupled with a variety of methodological problems and inconsistencies in these data, clearly demonstrate the need for additional research" [48, p. 407]. Griffiths concluded that "the one consistent finding is that the majority of the studies on very young children—as opposed to those in their teens upwards—tend to show that children do become more aggressive after either playing or watching a violent video game. However, all of these come from the use of one particular research methodology (i.e., observation of children's free play)" [49, p. 203].

J. L. Sherry [personal communication, October 25, 1999] conducted a meta-analysis and found that the overall effect of violent video games on aggression was small. He obtained an overall effect size of .12. For comparison, according to Cohen [50], .20 is a small effect size, .50 is a medium effect size, and .80 a large effect size. Although the evidence to date is not definitive, Sherry's review suggested that there is a smaller effect of violent video games on aggression than has been found with television violence on aggression. Sherry also found that more recent games, which contain human characters engaging in violence, registered greater effect sizes than games with more abstract violence.

Including our review, each of the four reviews identified major gaps in the existing research. These gaps include a lack of randomized, well-controlled research, particularly with adolescents; a lack of research on possible long-term effects; and a lack of research on subsets of individuals, possibly with other risk factors, who may be more susceptible to negative effects of game-playing. Three of the four reviews (including our own) found that the current evidence suggests a role that is either limited in size or scope. Thus, at present, it may be concluded that the research evidence is not supportive of a major public health concern that violent video games lead to real-life violence. However, this conclusion might change as more research is conducted on more recent and increasingly realistic games.

### Limitations of the Review

The most obvious explanation for the lack of published experimental studies examining the effect of violent video games on aggressive behavior in teenagers or adults is that few experimental studies have been conducted, although these types of studies are certainly possible [51]. It is also possible that studies were conducted without significant findings, and so were not published [52]. Although we attempted to include all the reports of which we were aware, we have been unable to obtain three dissertation studies [53–55] and one conference report [56] cited in other reports and that appear to be relevant to this review. According to comments about those studies in other reports, it appears that most, if not all of them, yielded nonsignificant findings, so that, if they were included, the evidence for an effect of video game play on aggression would likely be even weaker than we have described.

Our literature review was limited to examining the associations between video games with aggressive content and aggressive and antisocial thoughts, feelings, and behaviors. Negative effects other than increasing aggression, such as reinforcing racist or sexist stereotypes, have also been suggested [9,22]. However, video games may also have positive effects such as training spatial skills or divided-attention performance [57] or helping some youth deal with developmental issues [19,58].

Personality differences influencing reactions to media violence have received relatively little attention. Anderson and Dill [5] found that aggressive and irritable males showed a relatively stronger association between video game violence and aggression than did females or nonaggressive males. Similarly, Zillman and Weaver [59] reported that repeatedly viewing films that show gratuitous violence (such as *Total Recall* and *Die Hard II*) had a more negative effect of increased acceptance of violence as

a means of conflict resolution for males who were high in psychoticism (which involves high levels of hostility and low empathy) than for males low in psychoticism or for females with either level of psychoticism. Weaver and Zillman [59] argued that persons who are "already callous and harbor social discontent and hostility, should be most receptive of the supportive information contained in violent displays. . .persons without such inclinations should find it hard to accept the concept that violent actions are acceptable means of conflict resolution, if only because they respond with empathic distress to portrayals of coercion and victimization" [p. 614]. Other risk factors for violence, such as a history of child abuse, may also influence susceptibility to violence in video games and other media, although this risk factor has not been examined to date.

In conclusion, current research evidence is not supportive of a major concern that violent video games lead to real-life violence. However, well-controlled studies of adolescents are lacking. Also, this conclusion might change as more research is conducted on more recent and increasingly realistic games.

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