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Playing with fire?

The latest computer games involve pretty gruesome scenes — severed limbs and drive-by shootings are standard fare. But opinion is divided on whether such games spark real-life violence. Tony Reichhardt investigates.

How about this for two contrasting views of the same phenomenon? When Craig Anderson watches teenagers playing violent video games such as *Doom* and *Grand Theft Auto*, he believes that seeds of aggression are being sown in their minds. Anderson, a psychologist at Iowa State University in Ames, says that experiments he and others have carried out show that players become more likely to harbour aggressive thoughts and show aggressive behaviour. He sometimes opens articles about media violence with ominous reminders of the 1999 Columbine High massacre in Littleton, Colorado. The Columbine killers, it seems, were big fans of *Doom*.

Kevin Durkin, a psychologist at the University of Western Australia in Crawley, observes teenagers playing arcade games, even violent ones, and sees something entirely different: kids having a good time. Whatever aggression the players show towards each other is generally good-natured, and accompanied by laughter.

"The main type of aggression was robust treatment of the equipment," he noted dryly in a 1999 study for the Australian government¹. Computer games, he concluded last year², can be "a positive feature of a healthy adolescence".

Contrasting views are not unusual in media-violence research. In one corner are parents' groups and politicians, who worry that the games' violence fuels real-life aggression, and say that the majority of research confirms such fears. Lined up against them are the researchers who side with Durkin, together with freedom-of-speech advocates. The evidence is weak, they counter, and their opponents use dubious statistics to make their point.

So who is right? The answer is far from clear, partly because the two sides are engaged in a war of words that can be as combative as some of the games being studied. Researchers who deny a link between violence and computer games have, for example, had their work challenged on the grounds that they received funding from the entertainment

industry. Others point out that some supporters of a link make money by advising parent-focused media watchdogs. The answer may be out there, but locating it amid the controversy is difficult. *Mortal Kombat* indeed.

Study stand-off

The public split between the two sides centres on their interpretation of existing studies. Although the vast majority of work on violence in the media has focused on television, Anderson and supporters say that we already know enough about computer games to be concerned. Together with former Iowa State colleague Brad Bushman, now at the University of Michigan in Ann Arbor, Anderson analysed 35 video-game studies carried out as of 2000. The research, the pair argue, shows that video-game violence "is correlated with aggression in the real world"³.

Typical of the studies is one that Anderson carried out with Karen Dill, a psychologist at Lenoir-Rhyne College in Hickory,

North Carolina. College students played violent and non-violent games, and then competed against each other in another game in which they tried to push a button faster than their opponent. If they won, they got to blast the loser with a loud noise. Those who played the violent game blasted their opponents for about a tenth of a second longer than non-violent gamers, but only when they had been blasted themselves in the previous round. "Playing a violent video game increased the aggressiveness of participants after they had been provoked by their opponent's noise blast," the authors concluded⁴.

But Durkin's review of the literature led him to downplay the threat from video games: "Despite much debate about the consequences of playing games with aggressive content, the evidence available to date to support claims of harmful effects upon children is modest." Ditto Lillian Bensley and Juliet VanEenwyk, epidemiologists at the Washington State Department of Health in Olympia, who published a review of computer-game literature in 2000. "The research evidence is not supportive of a major public concern that violent video games lead to real-life violence," they wrote⁵.

Cartoon categories

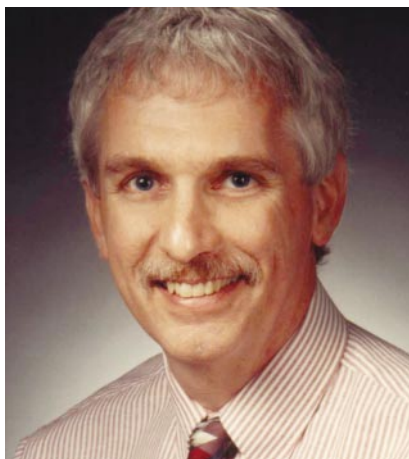
How can groups reach such different conclusions? Part of the answer lies in the difficulty of comparing studies. Take the definition of violent content, for example. One widely cited study of television violence was published in March by Rowell Huesmann, a psychologist at the University of Michigan. He found that subjects who had watched violent shows and identified with aggressive television characters as children showed more aggression in early adulthood⁶. But in the study, *Roadrunner* cartoons were described as "very violent", leading critics to question the method's validity. Assessments of video-game violence suffer similar problems. One group of researchers, for example, counted Pac Man being swallowed by ghosts as a violent event, and tallied 0.59 "deaths per minute" in a *Smurfs* game⁷.

Michael Rich, head of the Center on Media and Child Health at the Children's Hospital in Boston, Massachusetts, and a film-maker turned paediatrician, would like to end this confusion. "We need to get out of this mode where everybody's measuring different things," he says. The centre hopes to standardize existing studies of television and video games to allow direct comparison, and to develop a content-based ratings system grounded on the principles of developmental psychology.

Hints about how this could be done come from the work of Jeanne Funk, a psychologist at the University of Toledo in Ohio, who has helped to review rating standards for the software industry. Funk consulted with teenagers to come up with more subtle and descriptive categories, such as 'fantasy violence', 'human violence' and 'sports violence'. The Entertainment Software Rating Board, the New York-



Screen shot: Craig Anderson (below) suspects that the game *Doom* influenced Eric Harris and Dylan Klebold's rampage at Columbine High School.



based body that oversees US game classifications, plans to incorporate such categories in its labelling, and the descriptions could also help game-violence researchers to be more specific about what kind of content they are assessing.

Other problems may be more difficult to tackle. Different experiments often measure different proxies for aggression, for example. Some merely record signs of physiological arousal, such as increased heart rate and blood pressure, after subjects play violent games. Others try to assess violent thoughts, based, for example, on how subjects complete a partial story given to them. Few studies have looked at actual acts, such as blasting another person with sound in the lab, or hitting other children.

Although Anderson maintains that aggression in the lab is essentially the same as aggression in the real world, critics see the connection as tenuous. Both sides agree that carefully designed longitudinal studies — tracking the real-life histories of heavy game players — would advance our understanding.

But Anderson and his colleagues have been unable to obtain funding for such research.

Policy-makers, meanwhile, cannot wait for science to catch up — they come under pressure every time a violent new game is released, and have to act on the available evidence, even if it is limited. Almost every session of the US Congress includes an attack on the dangers that television and video-game violence pose to America's youth. And local law-makers are beginning to take action. In May, for example, Washington became the first state to ban sales of realistic cop-killer games to children younger than 17 years of age.

Small influence

Are such measures justified on scientific grounds? Some of the researchers consulted by *Nature* argue that computer games could lead to violent behaviour under certain conditions — they might trigger aggression in certain people already predisposed to violence, for example. But few support the idea that video games are important causes of violence in the real world. A 2001 report on violence issued by the US Surgeon General⁸ sums up their opinions: "Taken together, findings to date suggest that media violence has a relatively small impact on violence."

Some of the most damning verdicts on video-game studies come from those who study violence in general. Jeffrey Fagan, who heads the Center for Violence Research and Prevention at Columbia University in New York, says media-violence researchers are guilty of "a lot of sloppy thinking about causality". Look at it from an epidemiological viewpoint, he urges. With millions of copies of *Doom* sold, we would be seeing an epidemic of violence unless the dose-response rate is extremely small. Meanwhile, violence in the United States has declined — in 2001 it reached its lowest level since records began in 1972. Claiming that television or video games are important contributors to societal violence "doesn't pass the giggle test", says Fagan.

Anderson remains undaunted, however. While conceding that media exposure may not be the most important risk factor for violent behaviour, he insists that the link between video games and aggression "has pretty much been established". But he is likely to need more definitive evidence to persuade his colleagues, let alone the millions of kids eagerly awaiting the next action-packed game. ■

Tony Reichhardt writes for *Nature* from Washington.

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