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General Article

EFFECTS OF VIOLENT VIDEO GAMES ON AGGRESSIVE BEHAVIOR, AGGRESSIVE COGNITION, AGGRESSIVE AFFECT, PHYSIOLOGICAL AROUSAL, AND PROSOCIAL BEHAVIOR: A Meta-Analytic Review of the Scientific Literature

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Research on exposure to television and movie violence suggests that playing violent video games will increase aggressive behavior. A meta-analytic review of the video-game research literature reveals that violent video games increase aggressive behavior in children and young adults. Experimental and nonexperimental studies with males and females in laboratory and field settings support this conclusion. Analyses also reveal that exposure to violent video games increases physiological arousal and aggression-related thoughts and feelings. Playing violent video games also decreases prosocial behavior.

Paducah, Kentucky. Jonesboro, Arkansas. Littleton, Colorado. These three towns recently experienced similar multiple school shootings. The shooters were students who habitually played violent video games. Eric Harris and Dylan Klebold, the Columbine High School students who murdered 13 people and wounded 23 in Littleton, before killing themselves, enjoyed playing the bloody video game Doom. Harris created a customized version of Doom with two shooters, extra weapons, unlimited ammunition, and victims who could not fight back—features that are eerily similar to aspects of the actual shootings.

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The one positive result of these tragedies is the attention brought to the growing problem of video-game violence, from the newsroom to the U.S. Senate (2000). At a Commerce Committee hearing, several researchers testified that there are indeed valid reasons, both theoretical and empirical, to be concerned about exposing youths to violent video games (Anderson, 2000).

Video-game industry leaders deny the harmful effects of their products. For example, in a May 12, 2000, CNN interview on *The World Today*, Doug Lowenstein, president of the Interactive Digital Software Association, said, "I think the issue has been vastly overblown and overstated, often by politicians and others who don't fully understand, frankly, this industry. There is absolutely no evidence, none, that playing a violent video game leads to aggressive behavior."

There is one grain of truth in the industry's denials. Specifically, the fact that some highly publicized school killings were committed by individuals who habitually played violent video games is not strong evidence that violent video games increase aggression. Society needs solid scientific evidence in addition to such case studies. And here is where media researchers and the video-game industry differ. Research evidence has been slowly accumulating since the mid-1980s. This article reviews the research.

DEFINITIONS

Key terms used by the research community often mean something different to the general public and public policy-

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makers. In this article, we use the following, more precise, meanings common to media-violence researchers.

Violent Media

Violent media are those that depict intentional attempts by individuals to inflict harm on others. An "individual" can be a nonhuman cartoon character, a real person, or anything in between. Thus, traditional Saturday-morning cartoons (e.g., "Mighty Mouse," "Road Runner") are filled with violence.

Aggression

Aggression is behavior intended to harm another individual who is motivated to avoid that harm. It is not an affect, emotion, or aggressive thought, plan, or wish. This definition excludes accidental acts that lead to harm, such as losing control of an auto and accidentally killing a pedestrian, but includes behaviors intended to harm even if the attempt fails, such as when a bullet fired from a gun misses its human target.

Violence

Violence refers to extreme forms of aggression, such as physical assault and murder. All violence is aggression, but not all aggression is violence.

VIDEO-GAME STATISTICS

The U.S. population consumes much media violence. Youths between the ages of 8 and 18 spend more than 40 hr per week using some type of media, not counting school or homework assignments (Rideout, Foehr, Roberts, & Brodie, 1999). Television is most frequently used, but electronic video games are rapidly growing in popularity. About 10% of children aged 2 to 18 play console and computer video games more than 1 hr per day (Rideout et al., 1999). Among 8- to 13-year-old boys, the average is more than 7.5 hr per week (Roberts, Foehr, Rideout, & Brodie, 1999).

College students also play lots of video games. The Cooperative Institutional Research Program (1998, 1999) found that in 1998, 13.3% of men entering college played at least 6 hr per week as high school seniors. By 1999, that figure had increased to 14.8%. Furthermore, 2% of the men reported playing video games more than 20 hr per week in 1998. In 1999, that figure increased to 2.5%.

Although the first video games emerged in the late 1970s, violent video games came of age in the 1990s, with the killing games Mortal Kombat, Street Fighter, and Wolfenstein 3D. In all three games, the main task is to maim, wound, or kill opponents. The graphics (e.g., blood) and sounds (e.g., screams) of these games were cutting-edge at the time of their introduction. By the end of the 20th century, even more graphically violent games became available to players of all ages (Walsh, 1999). Numerous educational, nonviolent strategy, and sports games exist, but the most heavily marketed and consumed games are violent ones. Fourth-grade girls (59%) and boys (73%) report that the majority of their favorite games are violent ones (Buchman & Funk, 1996).

Another problem involves the lack of parental oversight. Teens in grades 8 through 12 report that 90% of their parents never check the ratings of video games before allowing their purchase, and only 1% of the teens' parents had ever prevented a purchase based on its rating (Walsh, 2000). Also, 89% reported that their parents never limited time spent playing video games.

Ratings provided by the video-game industry do not match those provided by other adults and game-playing youngsters. Many games involving violence by cartoonlike characters are classified by the industry as appropriate for general audiences, a classification with which adults and youngsters disagree (Funk, Flores, Buchman, & Germann, 1999).

VIOLENCE ON TELEVISION AND AT THE MOVIES

Five decades of research into the effects of exposure to violent television and movies have produced a thoroughly documented and highly sophisticated set of research findings. It is now known that even brief exposure to violent TV or movie scenes causes significant increases in aggression, that repeated exposure of children to media violence increases their aggressiveness as young adults, and that media violence is a significant risk factor in youth violence (Bushman & Huesmann, 2001; Huesmann et al., 2001).

Like the seat of a three-leg stool, the vast research literature on TV and movie violence rests on a firm foundation of three study types. The first is experimental research: Participants are randomly assigned to view either violent or nonviolent media and are later assessed for aggression. This work establishes a causal link between violent media and subsequent aggression. The second is cross-sectional correlational research: Participants' TV- and movie-viewing habits and aggression are assessed at one point in time. This work establishes a link between media violence and real-world aggression. The third is longitudinal research: TV- and movie-viewing habits and aggression are assessed repeatedly over time. This work more definitively establishes the causal link from media violence to real-world aggression. The consistency of findings within and between the three types of TV- and movie-violence studies makes this one of the strongest research platforms in all of psychology.

Why consider the literature on TV and movie violence when the focal question concerns video games? The answer has three parts. Many of the underlying psychological processes identified in the TV-movie literature also apply to video games. The research literature on TV-movie violence is large, whereas the literature on video-game violence is small. The literature on TV-movie violence has had ample time to answer early criticisms of the research with additional research. For example, claims that only a very small minority of viewers are adversely affected, that the effect of media violence on aggression is trivially small, or that watching violent TV and movies actually reduces ag-

gressive tendencies have all been carefully tested and rejected by the research evidence (Bushman & Huesmann, 2001).

WHY MEDIA VIOLENCE INCREASES AGGRESSION AND VIOLENCE

Why does exposure to violent media increase aggression and violence? Our General Aggression Model (GAM; Anderson & Bushman, in press), based on several earlier models of human aggression (e.g., Anderson, Anderson, & Deuser, 1996; Anderson, Deuser, & DeNeve, 1995; Bandura, 1971, 1973; Berkowitz, 1993; Crick & Dodge, 1994; Geen, 1990; Huesmann, 1986; Lindsay & Anderson, 2000; Zillmann, 1983) is a useful framework for understanding the effects of violent media. The enactment of aggression is largely based on the learning, activation, and application of aggression-related knowledge structures stored in memory (e.g., scripts, schemas). Figure 1 displays a simplified version of the single-episode portion of the model.

Situational input variables (e.g., recent exposure to violent media) influence aggressive behavior through their impact on the person's present internal state, represented by cognitive, affective, and arousal variables. Violent media increase aggression by teaching observers how to aggress, by priming aggressive cognitions (including previously learned aggressive scripts and aggressive perceptual schemata), by increasing arousal, or by creating an aggressive affective state.

Long-term effects also involve learning processes. From infancy, humans learn how to perceive, interpret, judge, and respond to events in the physical and social environment. Various types of knowledge structures for these tasks develop over time. They are based on day-to-day observations of and interactions with other people, real (as in the family) and imagined (as in the media). Each violent-media episode is essentially one more learning trial. As these knowledge structures are rehearsed, they become more complex, differentiated, and difficult to change.

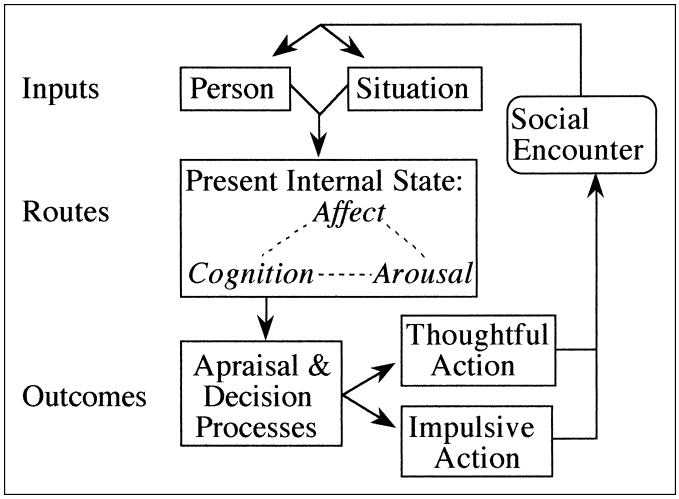

Fig. 1. Single-episode General Aggression Model. Adapted from Anderson and Bushman (in press).

Figure 2 illustrates long-term learning processes, identifies five types of relevant knowledge structures changed by repeated exposure to violent media, and links these long-term changes in aggressive personality to aggressive behavior in the immediate situation through both personological and situational variables. The link to person variables is obvious—the person is now more aggressive in outlook and propensity. Less obvious is how repeated exposure to violent media can change situational variables. Huesmann and his colleagues have developed a model of social and academic effects of exposure to television violence (Huesmann, 1994). Briefly, as a child becomes more habitually aggressive, the quality and types of social interactions he or she experiences also change. In sum, the combination of short-term and long-term processes produces the positive relation between exposure to media violence and aggressive-violent behavior.

Figure 2 also reveals why short-term effects of violent media on aggressive cognition are so important. Of the five types of variables identified as contributing to the long-term increase in aggressive personality, four involve aggressive cognitions. Indeed, the literature on the development of behavioral scripts suggests that even a few rehearsals can change a person's expectations and intentions involving important social behaviors (Anderson, 1983; Anderson & Godfrey, 1987; Marsh, Hicks, & Bink, 1998).

PROSOCIAL BEHAVIOR

Discussions of media violence frequently include reduction in prosocial behavior as one additional negative consequence. Though this is not a focal point of the present article, several studies have examined the link between violent video games

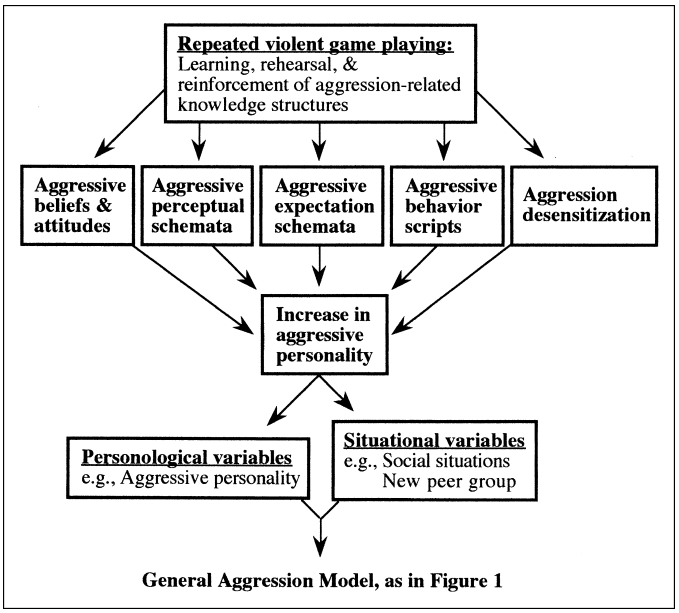

Fig. 2. Multiple-episode General Aggression Model of the long-term effects of video-game violence. Adapted from Anderson and Bushman (in press).

and prosocial behavior. We therefore included prosocial behavior in our meta-analyses of video-game effects.

VIOLENT VIDEO GAMES: KEY ISSUES

Two key issues emerge from consideration of violent video games and GAM. First, is exposure to violent video games associated with increases in aggression? This question requires empirical studies that assess the relation between exposure to violent video games and aggression, but does not require a detailed analysis of underlying processes.

Second, how can exposure to violent video games increase aggression? This question requires an examination of underlying processes, especially the three routes in the model: cognition, affect, and arousal. But only the cognitive route is specifically tied to the violent content of violent video games. Even nonviolent games can increase aggressive affect, perhaps by producing high levels of frustration. Similarly, exciting nonviolent games can increase arousal, but only violent games should directly prime aggressive thoughts and stimulate the long-term development of aggressive knowledge structures. Frustrating nonviolent games can increase aggressive cognitions indirectly, through links between feelings and thoughts (Anderson & Dill, 2000), but the real crux of the debate lies in the unique ability of violent video games to directly increase aggressive cognitions.

According to GAM, long-term effects of exposure to violent media result primarily from the development, rehearsal, and eventual automatization of aggressive knowledge structures such as perceptual schemata (Was this bump accidental or intentional?), social expectations (Are other people expected to be cooperative or vengeful?), and behavioral scripts (insult → retaliation). In sum, the second question concerns any of several potential underlying processes, but the most important one is whether brief and repeated exposure to violent video games increases aggressive cognitions.

On the basis of narrative review procedures, one of us (Anderson, 2000) testified at the Senate hearing that even though the video-game research literature is small, the findings overall demonstrate significant effects, and that short-term effects are clearly causal. Representatives of the video-game industry have repeatedly denied this. So who is right? To address both key issues, we conducted a meta-analysis of the existing video-game literature.

METHOD

Literature Search Procedures

We searched *PsycINFO* for all entries through 2000, using the following terms: (*video** or *computer* or *arcade*) and (*game**) and (*attack** or *fight** or *aggress** or *violen** or *hostil** or *ang** or *arous** or *prosocial* or *help**). The search retrieved 35 research reports that included 54 independent samples of participants.[1] A total of 4,262 participants was included in the studies. About half of the participants (46%) were under 18 years old. If a research report did not contain enough information to calculate an effect-size estimate, we contacted the authors and requested the missing information.

Criteria for Relevance

Studies were considered relevant if they examined the effects of playing violent video games on aggressive cognition, aggressive affect, aggressive behavior, physiological arousal, or prosocial behavior. Studies were excluded if participants merely watched someone else play a video game. In some studies, half of the participants played the game while the other half watched, and the reported results were collapsed across this play/watch manipulation. When we could not estimate the effect for "play" participants, we used the collapsed results but divided the sample size in half.

Coding Frame

We coded the following characteristics for each study: (a) sex of participants, (b) age of participants (adults $\geq$ 18 years old or children $<$ 18 years old), (c) type of study (experimental or nonexperimental), and (d) publication status (published or unpublished). We initially coded several other variables (e.g., level of violence in video games), but these were so confounded with age of participants that we dropped them. Most experimental studies were conducted in laboratory settings; many used standard lab measures of aggression (e.g., punishment delivered to an opponent). Most nonexperimental studies were conducted in field settings and used more "real world" types of aggressive behaviors (e.g., assault).

When multiple measures of the same type of dependent variable were reported, we used the average effect size in the meta-analyses. For nonexperimental studies, we used the most direct measure of violent-video-game exposure available (e.g., hours per week spent playing violent video games rather than hours per week spent playing video games in general).

Meta-Analytic Procedures

We used the correlation coefficient, denoted by r, as the effect-size estimate. According to Cohen (1988), a small r is $\pm.10$, a medium r is $\pm.30$, and a large r is $\pm.50$. Fisher's z transformation was applied to the correlations before they were averaged, weighted by the inverse of the variance (i.e., $n - 3$). Once a 95% confidence interval was obtained for the pooled z score, it was transformed back to a 95% confidence interval for the pooled r, denoted by r_+ (Hedges & Olkin, 1985).

We used the Statistical Analysis System (SAS) to fit both fixed- and random-effects models (Wang & Bushman, 1999). Random-effects models allow generalizations to a broader universe of studies than do fixed-effects models. The price one pays for this broader generalizability is less statistical power (Rosenthal, 1995). Because we are interested in making gener-

1. A list of the studies included in the meta-analysis, as well as effects and coded variables, can be obtained from the following Web page: http://psychserver.iastate.edu/faculty/caa/abstracts/2000-2004/01AB.html.

alizations to a universe of diverse studies, we report only the results of the more conservative random-effects model.

The random-effects variance was greater than zero for all five dependent measures, indicating that the effects for each measure probably did not come from one population. For each dependent measure, homogeneity tests were conducted to determine whether the variance in effect sizes between studies was greater than what would be expected by chance (Hedges & Olkin, 1985).

We also conducted moderator analyses, focusing on age of participants (average age ≥ 18 vs. younger), study type (experimental vs. nonexperimental), and publication status (published vs. unpublished). The first two potential moderators are of particular interest, because it is important to know whether similar effects occur for children and young adults, and for experimental studies (which allow for strong causal statements) and nonexperimental ones (which generally use more naturalistic measures of aggression). Some authors did not report effects of violent video games separately for males and females. Furthermore, preliminary analyses revealed that sex did not significantly influence the magnitude of the effects for any of the dependent measures. Thus, sex was excluded from the moderator analyses.

Multicollinearity between model terms was tested by means of variance inflation factors (VIF; e.g., Neter, Wasserman, & Kutner, 1990). The maximum VIF was 1.38, indicating that multicollinearity was not a problem.

RESULTS

Figure 3 shows box plots for the five dependent measures. In a box plot, lines are drawn at the 25th, 50th, and 75th percentiles. The distance between the 75th and 25th percentiles is the interquartile range. Capped vertical bars extend as far as the data extend, to a distance of at most 1.5 interquartile ranges. For each variable in Figure 3, the average effect-size correlation is significantly different from zero.

Aggressive Behavior

Is there a reliable association between exposure to violent video games and aggression? Across the 33 independent tests of the relation between video-game violence and aggression, involving 3,033 participants, the average effect size was positive and significant, $r_+ = .19$.[2] High video-game violence was definitely associated with heightened aggression (see Table 1). Indeed, this effect of violent video games on aggression is as strong as the effect of condom use on risk of HIV infection (Weller, 1993).

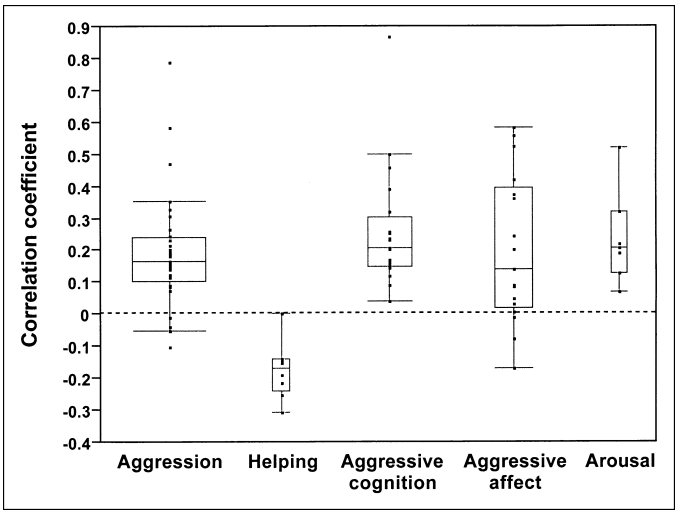

Fig. 3. Box plots for the five dependent variables. The width of each box is proportional to the number of correlations for the box plot.

The moderator analyses (Table 2) yielded no significant effects. Violent video games increased aggression in males and females, in children and adults, and in experimental and nonexperimental settings. But because the experimental/nonexperimental distinction is so important, we calculated separate average effect sizes for each type of study. For the 21 experimental tests, the average effect was $r_+ = .18$, 95% confidence interval = (.13, .24). Thus, short-term exposure to violent video games causes at least a temporary increase in aggression. For the 13 nonexperimental tests, the average effect was $r_+ = .19$ (.15, .23). Thus, exposure to violent video games is correlated with aggression in the real world.[3]

We further divided the nonexperimental tests into three categories based on how exposure to violent video games was measured—by time spent playing violent games, preference for violent games, or time spent playing video games in general, ignoring game content. The magnitude of the effect did not depend on the type of measure used, $\chi^2(2) = 2.14$, $p > .05$. In all three cases, the average correlations with aggression were positive and statistically significant. The average correlations (with 95% confidence intervals) were .26 (.18, .34) for time spent playing violent video games, .16 (.10, .22) for preference for violent video games, and .16 (.11, .22) for time spent playing video games in general.

We further divided experimental tests into two categories, based on whether the aggression target was another person. The magnitude of the effect depended on the aggression target, $\chi^2(1) = 4.80$, $p < .05$. The average effect was larger if the target was an inanimate object than if the target was a person, $r_+ = .41$ (.28, .54), $k = 5$, and $r_+ = .14$ (.08, .20), $k = 18$, respectively.

2. Experimental studies used two different types of aggression measures: (a) coders' ratings of observed behaviors (e.g., hitting, kicking, pushing) and (b) physical measures (e.g., shock or noise intensity). The magnitude of the effect did not depend on type of measure used, $\chi^2(1) = 0.03$, $p > .05$. Nonexperimental studies used three different types of aggression measures: (a) self-reported aggression, (b) other-reported aggression (e.g., reports from teachers, peers, or parents), and (c) physical measures (e.g., shock or noise intensity, convictions for violent crimes). The magnitude of the relation did not depend on the type of measure used, $\chi^2(2) = 0.32$, $p > .05$.

3. In some cases, the number of independent tests and the total number of experimental and nonexperimental tests differ. Similarly, the degrees of freedom in Tables 1 and 2 do not always correspond. This is because some studies contributed more than one effect to the moderator analyses (e.g., some studies provided an experimental effect and a nonexperimental effect).

Table 1. *Average correlations, 95% confidence intervals, and homogeneity tests for five dependent measures*

Dependent measure	k	N	r_+	95% C.I.	Homogeneity test	Estimate of random-effects variance (95% C.I.)
Aggressive behavior	33	3,033	.19	(.15, .22)	$\chi^2(32) = 23.25, p > .05$	0.042 (0.029, 0.068)
Prosocial behavior	8	676	−.16	(−.22, −.09)	$\chi^2(7) = 1.30, p > .05$	0.013 (0.006, 0.048)
Aggressive cognition	20	1,495	.27	(.22, .31)	$\chi^2(19) = 29.15, p > .05$	0.087 (0.054, 0.164)
Aggressive affect	17	1,151	.18	(.12, .24)	$\chi^2(16) = 15.11, p > .05$	0.070 (0.039, 0.161)
Physiological arousal	7	395	.22	(.12, .32)	$\chi^2(6) = 2.32, p > .05$	0.028 (0.012, 0.115)

Note. k = number of independent correlations; N = number of participants; r_+ = pooled correlation coefficient; C.I. = confidence interval. The variance in each random-effects model was estimated using the residual (restricted) maximum likelihood method (see Wang & Bushman, 1999).

Prosocial Behavior

The eight independent tests of the relation between violent video games and prosocial behavior, involving 676 participants, yielded an average effect that was negative and significant, $r_+ = -.16$ (Table 1).[4] There were too few studies to warrant moderator analyses. However, we separated these effects into experimental and nonexperimental ones. The average effect for the seven experimental tests was −.17 (−.25, −.08). Thus, violent video games cause at least a temporary decrease in prosocial behavior. The average effect for the two nonexperimental tests was −.14 (−.25, −.02). Thus, exposure to violent video games is negatively correlated with helping in the real world.

Aggressive Cognition

The 20 independent tests of the link between video-game violence and aggressive cognition, involving 1,495 participants, yielded an average effect that was positive and significant, $r_+ = .27$ (see Table 1).[5] The moderator analyses (Table 2) yielded no significant effects. Violent video games increased aggressive thoughts in males and females, in children and adults, and in experimental and nonexperimental settings. Most of these studies were experimental, thus demonstrating a causal link between exposure to violent video games and aggressive cognition. Therefore, violent video games may increase aggression in the short term by increasing aggressive thoughts. These results are also important for understanding long-term effects, as discussed earlier (Fig. 2).

Aggressive Affect

The 17 independent tests of the link between video-game violence and aggressive affect, involving 1,151 participants, also yielded a significant positive effect, $r_+ = .18$ (Table 1). Moderator analyses yielded no significant effects (Table 2). Violent video games increased aggressive affect in males and females, in children and adults, and in experimental and nonexperimental studies, suggesting that violent video games may also increase aggression by increasing feelings of anger or hostility.

Physiological Arousal

The seven independent tests of the link between video-game violence and physiological arousal, involving 395 participants, showed that exposure to violent video games increased physiological arousal, $r_+ = .22$ (Table 1). There were too few studies to warrant moderator analyses. Three measures of arousal were used in these studies: systolic blood pressure, diastolic blood pressure, and heart rate. Type of measure did not significantly influence the results, $\chi^2(2) = 0.31, p > .05$.

DISCUSSION

These results clearly support the hypothesis that exposure to violent video games poses a public-health threat to children and youths, including college-age individuals. Exposure is positively associated with heightened levels of aggression in young adults and children, in experimental and nonexperimental designs, and in males and females. Exposure is negatively associated with prosocial behavior. Furthermore, exposure is positively related to the main mechanism underlying long-term effects on the development of aggressive personality—aggressive cognition. Finally, exposure is positively linked to aggressive affect and physiological arousal. In brief, every theoretical prediction derived from prior research and from GAM was supported by the meta-analysis of currently available research on violent video games.

This relatively small literature replicates with video games two of the three types of research that have been used to effectively demonstrate short- and long-term causal effects of TV and movie violence on aggression and violence. The type of research missing from the video-game domain is longitudinal research. Given the similarity of the processes activated by various types of media and the similarity of findings in the extant literatures on video-game and TV-movie violence, it would

4. The type of helping measure used (e.g., other-report, coders' ratings) did not significantly influence the magnitude of the effect, $\chi^2(1) = 0.26, p > .05$. There were too few studies to analyze the influence of type of helping measure on experimental and nonexperimental studies separately.

5. The 5 nonexperimental studies used only hypothetical situations to measure aggressive cognition. The 19 experimental studies used three different measures of aggressive cognition: (a) hypothetical situations, (b) self-report measures of trait aggressiveness, and (c) standard procedures (e.g., reaction time, word-stem completion). The type of measure used, however, did not significantly influence the results, $\chi^2(2) = 2.89, p > .05$.

Table 2. *Random-effects models for aggressive behavior, aggressive cognition, and aggressive affect*

Model term	Dependent measure		
	Aggressive behavior	Aggressive cognition	Aggressive affect
Model	$\chi^2(3) = 1.14, p > .05$	$\chi^2(3) = 3.25, p > .05$	$\chi^2(3) = 4.56, p > .05$
Age	$\chi^2(1) = 0.67, p > .05$	$\chi^2(1) = 0.00, p > .05$	$\chi^2(1) = 3.08, p > .05$
Type of study	$\chi^2(1) = 0.15, p > .05$	$\chi^2(1) = 1.79, p > .05$	$\chi^2(1) = 2.95, p > .05$
Publication status	$\chi^2(1) = 0.11, p > .05$	$\chi^2(1) = 1.26, p > .05$	$\chi^2(1) = 0.34, p > .05$
Error	$\chi^2(42) = 25.74, p > .05$	$\chi^2(24) = 20.35, p > .05$	$\chi^2(14) = 9.95, p > .05$
Estimate of random-effects variance (95% C.I.)	0.044 (0.030, 0.071)	0.085 (0.051, 0.168)	0.059 (0.031, 0.153)

Note. Age = college students vs. younger; type of study = experimental vs. nonexperimental; publication status = published vs. unpublished; C.I. = confidence interval. The variance in each random-effects model was estimated using the residual (restricted) maximum likelihood method (see Wang & Bushman, 1999).

be very surprising if repeated exposure to violent video games did not increase long-term aggression. Nonetheless, such longitudinal research is badly needed. Other questions in need of further research concern the relative magnitude of effects of video-game versus TV-movie violence, and the details of how media violence in general and video-game violence in particular create the observed short-term and the expected long-term increases in aggression and violence (Anderson & Dill, 2000).

Finally, we wonder whether exciting video games can be created to teach and reinforce nonviolent solutions to social conflicts. If marketed with the same zeal (and dollars) as the destructive games that currently dominate the market, would they be as profitable? In other words, is it possible to use the profit motive that has for years driven the media-violence machine to turn that machine in a prosocial direction?

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