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Violent Video Games: Myths, Facts, and Unanswered Questions

by Craig A. Anderson

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After 40+ years of research, one might think that debate about media violence effects would be over. An historical examination of the research reveals that debate concerning whether such exposure is a significant risk factor for aggressive and violent behavior should have been over years ago (Bushman & Anderson, 2001). Four types of media violence studies provide converging evidence of such effects: laboratory experiments, field experiments, cross-sectional correlation studies, and longitudinal studies (Anderson & Bushman, 2002a; Bushman & Huesmann, 2000). But the development of a new genre—electronic video games—reinvigorated the debate.

Two features of video games fuel renewed interest by researchers, public policy makers, and the general public. First, the active role required by video games is a double-edged sword. It helps educational video games be excellent teaching tools for motivational and learning process reasons. But, it also may make violent video games even more hazardous than violent television or cinema. Second, the arrival of a new generation of ultraviolent video games beginning in the early 1990s and continuing unabated to the present resulted in large numbers of children and youths actively participating in entertainment violence that went way beyond anything available to them on television or in movies. Recent video games reward players for killing innocent bystanders, police, and prostitutes, using a wide range of weapons including guns, knives, flame throwers, swords, baseball bats, cars, hands, and feet. Some include cut scenes (i.e., brief movie clips supposedly designed to move the story forward) of strippers. In some, the player assumes the role of hero, whereas in others the player is a criminal.

The new debate frequently generates more heat than light. Many criticisms are simply recycled myths from earlier media violence debates, myths that have been repeatedly debunked on theoretical and empirical grounds. Valid weaknesses have also been identified (and often corrected) by media violence researchers themselves. Although the violent video game literature is still relatively new and small, we have learned a lot about their effects and have successfully answered several key questions. So, what is myth and what do we know?

Myths and Facts

Myth 1. Violent video game research has yielded very mixed results.
Facts: Some studies have yielded nonsignificant video game effects, just as some smoking studies failed to find a significant link to lung cancer. But when one combines all relevant empirical studies using meta-analytic techniques, five separate effects emerge with considerable consistency. Violent video games are significantly associated with: increased aggressive behavior, thoughts, and affect; increased physiological arousal; and decreased prosocial (helping) behavior. Average effect sizes for experimental studies (which help establish causality) and correlational studies (which allow examination of serious violent behavior) appear comparable (Anderson & Bushman, 2001).

Myth 2. The studies that find significant effects are the weakest methodologically.
Facts: Methodologically stronger studies have yielded the largest effects (Anderson, in press). Thus, earlier effect size estimates —based on all video game studies— probably underestimate the actual effect sizes.

Myth 3. Laboratory experiments are irrelevant (trivial measures, demand characteristics, lack external validity).
Facts: Arguments against laboratory experiments in behavioral sciences have been successfully debunked many times by numerous researchers over the years. Specific examinations of such issues in the aggression domain have consistently found evidence of high external validity. For example, variables known to influence real world aggression and violence have the same effects on laboratory measures of aggression (Anderson & Bushman, 1997).

Myth 4. Field experiments are irrelevant (aggression measures based either on direct imitation of video game behaviors (e.g., karate kicks) or are normal play behaviors.
Facts: Some field experiments have used behaviors such as biting, pinching, hitting, pushing, and pulling hair, behaviors that were not modeled in the game. The fact that these aggressive behaviors occur in natural environments does not make them "normal" play behavior, but it does increase the face validity (and some would argue the external validity) of the measures.

Myth 5. Correlational studies are irrelevant.
Facts: The overly simplistic mantra, "Correlation is not causation," is useful when teaching introductory students the risks in too-readily drawing causal conclusions from a simple empirical correlation between two measured variables. However, correlational studies are routinely used in modern science to test theories that are inherently causal. Whole scientific fields are based on correlational data (e.g., astronomy). Well conducted correlational studies provide opportunities for theory falsification. They allow examination of serious acts of aggression that would be unethical to study in experimental contexts. They allow for statistical controls of plausible alternative explanations.

Myth 6. There are no studies linking violent video game play to serious aggression.
Facts: High levels of violent video game exposure have been linked to delinquency, fighting at school and during free play periods, and violent criminal behavior (e.g., self-reported assault, robbery).

Myth 7. Violent video games affect only a small fraction of players.
Facts: Though there are good theoretical reasons to expect some populations to be more susceptible to violent video game effects than others, the research literature has not yet substantiated this. That is, there is not consistent evidence for the claim that younger children are more negatively affected than adolescents or young adults or that males are more affected than females. There is some evidence that highly aggressive individuals are more affected than nonaggressive individuals, but this finding does not consistently occur. Even nonaggressive individuals are consistently affected by brief exposures. Further research will likely find some significant moderators of violent video game effects, because the much larger research literature on television violence has found such effects and the underlying processes are the same. However, even that larger literature has not identified a sizeable population that is totally immune to negative effects of media violence.

Myth 8. Unrealistic video game violence is completely safe for adolescents and older youths.
Facts: Cartoonish and fantasy violence is often perceived (incorrectly) by parents and public policy makers as safe even for children. However, experimental studies with college students have consistently found increased aggression after exposure to clearly unrealistic and fantasy violent video games. Indeed, at least one recent study found significant increases in aggression by college students after playing E-rated (suitable for everyone) violent video games.

Myth 9. The effects of violent video games are trivially small.
Facts: Meta-analyses reveal that violent video game effect sizes are larger than the effect of second hand tobacco smoke on lung cancer, the effect of lead exposure to I.Q. scores in children, and calcium intake on bone mass. Furthermore, the fact that so many youths are exposed to such high levels of video game violence further increases the societal costs of this risk factor (Rosenthal, 1986).

Myth 10. Arousal, not violent content, accounts for video game induced increases in aggression.
Facts: Arousal cannot explain the results of most correlational studies because the measured aggression did not occur immediately after the violent video games were played. Furthermore, several experimental studies have controlled potential arousal effects, and still yielded more aggression by those who played the violent game.

Myth 11. If violent video games cause increases in aggression, violent crime rates in the U.S. would be increasing instead of decreasing.
Facts: Three assumptions must all be true for this myth to be valid: (a) exposure to violent media (including video games) is increasing; (b) youth violent crime rates are decreasing; (c) video game violence is the only (or the primary) factor contributing to societal violence. The first assumption is probably true. The second is not true, as reported by the 2001 Report of the Surgeon General on Youth Violence (Figure 2-7, p. 25). The third is clearly untrue. Media violence is only one of many factors that contribute to societal violence and is certainly

not the most important one. Media violence researchers have repeatedly noted this.

Theory

One frequently overlooked factor in this debate is the role of scientific theory. Pure empirical facts often have relatively little meaning and are seldom convincing. When those same facts fit a broader theory, especially one that has been tested in other contexts, those facts become more understandable and convincing. Recent years have seen considerable progress in basic theoretical models of human aggression (for recent integrations see Anderson & Bushman, 2002b; Anderson & Huesmann, in press; Anderson & Carnagey, in press).

Most such models take a social cognitive view of human aggression, integrating social learning theory, advances in cognitive psychology, script theory, developmental theories, and biological influences. Using such general models, media violence scholars now have a clear picture of how media violence increases aggression in short and long term contexts. Immediately after exposure to media violence, there is an increase in aggressive behavior tendencies because of several factors. 1. Aggressive thoughts increase, which in turn increase the likelihood that a mild or ambiguous provocation will be interpreted in a hostile fashion. 2. Aggressive affect increases. 3. General arousal (e.g., heart rate) increases, which tends to increase the dominant behavioral tendency. 4. Direct imitation of recently observed aggressive behaviors sometimes occurs.

Repeated media violence exposure increases aggression across the lifespan because of several related factors. 1. It creates more positive attitudes, beliefs, and expectations regarding use of aggressive solutions. 2. It creates aggressive behavioral scripts and makes them more cognitively accessible. 3. It decreases the accessibility of nonviolent scripts. 4. It decreases the normal negative emotional reactions to conflict, aggression, and violence.

Unanswered Questions

Several major gaps remain in the violent video game literature. One especially large gap is the lack of longitudinal studies testing the link between habitual violent video game exposure and later aggression, while controlling for earlier levels of aggression and other risk factors. Indeed, of the four major types of empirical studies mentioned earlier, this is the only type missing. There are such studies focusing on television violence but none on video games.

Another gap concerns potential differences in effect sizes of television versus video game violence. There are theoretical reasons to believe that violent video game effects may prove larger, primarily because of the active and repetitive learning aspects of video games. However, this is a very difficult question to investigate, especially with experimental designs. How does one select violent video game and television stimuli that are matched on other dimensions? On what dimensions should they be equivalent? Number of bodies? Amount of blood and gore? Realism of the images? There are a couple of unpublished correlational studies that have compared the effects of television and video game violence on aggression, using comparable measures of violence exposure. Both yielded results suggesting a larger effect of video game violence. But the issue is not settled.

Finally, more research is needed to: (a) refine emerging general models of human aggression; (b) delineate the processes underlying short and long term media violence effects; (c) broaden these models to encompass aggression at the level of subcultures and nations. Several different research groups around the world are working on these various issues.

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