2003

The effects of reward and punishment in violent video games on aggression

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by

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A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE

Major: Psychology

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Iowa State University
Ames, Iowa
2003

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ABSTRACT

This experiment examined the effects of rewarding and punishing violent actions in video games on direct aggression and displaced aggression. First, every participant completed an essay on a controversial topic. Next, each participant was randomly assigned to play one of the four versions of a racecar video game for twenty minutes. The four versions were: 1) killing bystanders and race opponents was rewarded, 2) killing bystanders was punished and killing race opponents was rewarded, 3) all violent action was punished, and 4) nonviolent. After playing a video game, all participants received severe negative feedback regarding their essay (provocation) by another participant. After receiving the negative feedback, each participant was given the opportunity to aggress against either the person responsible for the provocation (direct aggression) or another participant who was not responsible for the negative feedback (displaced aggression), by issuing bursts of static into the participant's headphones.

A significant linear contrast demonstrated that participants displayed more direct aggression when they played a video game that rewarded for violent actions. The number of pedestrians killed in the violent game versions mediated direct aggression in the laboratory. Trait aggressiveness was also positively correlated to laboratory aggression. Past violent video game exposure was positively correlated with trait aggressiveness, even after controlling for total video game exposure. The effect of video game violence on displaced aggression was unclear.

INTRODUCTION

Imagine this scenario: you and your buddy are planning revenge. You load up on extra weapons and tons of ammunition. You enter a building where you know there will be lots of people and no one will be able to fight back. You could just scare everyone, but you plan to do something more extreme. You unload your ammunition at them, shooting anything that moves. No one and no thing is left standing. You kill until there is nothing left to kill. What do you do next?

For Eric Harris and Dylan Klebold, they start the video game over and play it again, and again…and again. They kept playing it until April 20, 1999, when they decided that it was time to take this scenario out of the electronic world and into Columbine High School, where they killed 13 people and injured 23 others, before turning the guns on themselves (Pooley, 1999). There is no direct evidence that playing Harris's customized version of Doom (a "first-person" shooter video game where the player has unlimited ammo to use against opponents that cannot fight back) caused these two youths to behave the way they did, but public debate has risen over the role that this form of violent media had on this school shooting and others in Bethel, AL; Paducah, KY; and Jonesboro, AR (Walsh, 1999).

The video game market is one that has grown dramatically since its birth in the 1970s. In less than thirty years, this industry has transformed from a market only offering one game (Pong) in which players tried to bounce an electronic ball into numerous companies offering hundreds of games with annual sales totaling $20 billion worldwide (Cohen, 2000). Sony can attribute almost a third of its $20 billion annual sales to its PlayStation video game console (Cohen, 2000). In recent years,

video game annual sales have surpassed movie ticket sales (Elmer-Dewitt, 1993; Hettrick, 1995; Walsh, 2001).

The history of video games can be distinguished by three distinct eras (Gentile, Lynch, Linder, & Walsh, in press). Because Atari consoles dominated the video game market from 1977 to 1985, the first era was known as the "Atari era". These first video games contained little violence. Even when violence was present, it was quite abstract. Nolan Bushnell, the founder of Atari, stated "We had an internal rule that we wouldn't allow violence against people. You could blow up a tank or you could blow up a flying saucer, but you couldn't blow up people" (Kent, 2000). Another reason for the relatively low amount of violence in the early Atari video games was that the graphical ability of the console was so low that only simple graphics could be utilized.

Technological advances over the next ten years allowed computers to display more complex video game graphics. As graphics developed, so did the video game market. Violence also began to appear more, even in children's games. The second era (1985-95), also known as the "Nintendo era," was dominated mainly by Nintendo console games. The Nintendo console introduced a more powerful platform than Atari and began introducing violent themes in a variety of games. Even the seemingly innocent *Super Mario Brothers* games included the ability to destroy harmful creatures by stomping on them or by hurling fireballs at them.

As the computing power of second era consoles enabled more complicated graphics, more realistic portrayals of violence also flourished. It was also during this era that video games branched out and were able to be played on desktop

computers and in hand-held mini-game systems such as Nintendo Game Boy. When it became apparent to manufacturers that violent games sold well, the level of violence in games increased. Truly violent video games became vastly popular in this era with the killing games *Mortal Kombat*, *Street Fighter*, and *Wolfenstein 3D* (Anderson & Dill, 2000). *Mortal Kombat* led the way for violent video games in 1993 by becoming the most popular game of the year (Elmer-Hewitt, 1993). In *Mortal Kombat*, players control characters enrolled in a fighting tournament where the only way to advance to the next round is by killing your opponents. Players are encouraged via extra rewards for using extreme violence (e.g., ripping opponent's spine out or decapitating opponent). At approximately the same time, both Sega and Nintendo released home console versions of *Mortal Kombat*. However, Nintendo sold a sanitized version of the game, removing the most graphically violent features, depictions of blood, and the worst of the lethal moves. Sega released the unadulterated version and outsold Nintendo's version by nearly three to one. When Nintendo released the sequel, *Mortal Kombat 2,* it included all of the blood, gore and fatal moves that the Sega version included. This time, the Nintendo version outsold the Sega version, most likely because Nintendo was already the dominant video game console in the marketplace.

Some of the basic characteristics and labels of video games also emerged in this era. *Mortal Kombat* represents a type of game now known as "third-person fighting" games. It is a "third-person" game because the player can see the character that he or she is controlling. It is a "fighting" game because virtually all of the game action consists of fighting other game characters. A variety of third-person fighting

games were very popular in this era. *Street Fighter* is one such game. As in *Mortal Kombat*, the main theme is the player engages in a series of fights with various opponents. Another interesting feature of many third-person fighting games is that the player can choose who he or she wants to "be" from a variety of male and female characters. In part, this was an attempt to attract more female consumers.

First-person shooter games were another type of violent video game that developed during the "Nintendo era." In these games, the player sees the scenario through the eyes of the main character. The player can see his or her own hands and arms, as well as the weapons being used, but does not see his or her whole character. The games are referred to as "shooters" because most of the action involves shooting enemies with one kind of weapon or another. *Wolfenstein 3D* was one of the first three-dimensional "first-person shooters." In one version of *Wolfenstein 3D*, the player assumes the role of B.J. Blascowitz, an American soldier caught and taken as a prisoner of war by the Nazis during World War II. The player's job is to escape the prison and shoot his or her way through Castle Wolfenstein, killing everything that moves (both prison guards and guard dogs), with the ultimate goal of assassinating Adolph Hitler. The graphics of this game were very violent for this era. A successful player would see multiple bloody murders and hear victims scream and groan. In *Wolfenstein 3D* the human hero can choose from an array of weaponry including a revolver, automatic weapons, a flamethrower, and a knife.

We currently are in the third video game era (1995-present). The video game console market is largely dominated by the Sony Playstation and the most current platform, Playstation 2. Currently, video game buyers also have options of

purchasing Nintendo's latest console (Nintendo Gamecube) or Microsoft's X-Box (Microsoft's first endeavor into the console market). In this era, video game console's graphical capabilities have been greatly enhanced not only by improvements in computer technology but switching from cartridge-based systems to CD-ROM, and even more recently, DVD-ROM based systems. These technological advances have allowed console's capabilities to grow at a faster rate than during either of the two previous eras. The original Sony *PlayStation* processed 350,000 polygons per second (pg/s). Sega's *Dreamcast* surpassed this graphical benchmark by over nine times in 1999, when it processed over three million pg/s. Sony fired back and blew *Dreamcast* away when it's new *PlayStation 2* system processed 66 million pg/s. Microsoft's *Xbox*, released in 2001, almost doubled the graphic capability *Playstation 2* by processing at 125 million pg/s. The goal for *PlayStation* 3 is 1 billion pg/s. This skyrocketing increase in speed and graphic capability has allowed for more realistic violence than ever before. With these changes in computing power and graphic quality, the financial growth of video game market has been phenomenal in recent years. In 2001, despite an economic recession, the video game industry experienced 43% increase in sales, raising United States' sales to $9.4 billion (Markoff, 2002). Of course, video gaming on computers has also evolved into more violent gaming with more realistic graphics. For example, in 2000, the game *Soldier of Fortune* (SOF) was released for personal computer platforms, marking an all-time high in video game violence. This first-person shooter game was designed with the assistance of an ex-army colonel and featured 26 different "killing zones" in the body. The characters (also known as

targets) in the game responded differently (and realistically) depending on where in the body they are shot, what weapons are used, and what distance they are shot. For example, shooting a character in the arm at close range with a shotgun rips part of the arm off the target's body, leaving exposed bone and sinew while blood rushed from where the appendage used to be.

Besides having exclusive games solely for personal computers, most of the best selling console video games are also usually available on computers. Many games can also be downloaded from the Internet. This includes “demo” versions of extremely violent games that contain most if not all of the graphic features of the full version. These demos can be downloaded at no charge by virtually anyone with a computer and a modem. Walsh (2000) reported that 32% of all boys he surveyed who played video games acknowledged downloading such "demo" games from the Internet.

Another emerging trend is the growth of online gaming. There are numerous games video gamers can play over local area networks and over the Internet. The most recent advancement in online gaming is Microsoft's X-Box Online network. X-Box owners can utilize a broadband connection to play a variety of games with or against other online players. Some of these games are simply more complex versions of first person shooters, in which groups of gamers can play with or against other gamers in real time. A most interesting trend is the popularity of subscription-based online role-playing games, known as MMORPGs (massively multiplayer online role playing games). To play these games, a player must subscribe (currently, about $25 - $40 per month) to the company hosting the game. Players create their

own character for the game, and can increase the skills and power of that character by playing the game online. Characters can kill and can be killed by other players as well as characters built into the game. *Everquest* is currently the largest MMORPG, with approximately 400,000 subscribers worldwide (Sony Online, 2002). Players can be heavily invested in online gaming, displayed by gamers buying and selling their created characters for hundreds of dollars via online auctions (Ebay Online Auctions, 2003). The increased popularity of online gaming could be the beginning of a new video gaming era.

Video Games, Violent Content, and Preference for Violence

The content and themes of video games has drastically changed from the early Atari games. Recent content analyses show that as many as 89% of games contain some violent content (Children Now, 2001), and approximately half of the games include serious violent actions toward other game characters (Children Now, 2001; Dietz, 1998; Dill, Gentile, Richter, & Dill, 2001).

Additionally, many children prefer to play violent games. Even older surveys of school children (4th through 8th grade) showed that more than half preferred games with human violence or fantasy violence (Buchman & Funk, 1996; Funk, 1993). In surveys of paired children and parents, approximately two thirds of children named violent games as their favorite games. Most parents, however, are not likely to know what video games their child is playing. Only one third of parents were able to correctly identify their child's favorite video game. In 70% of the incorrect parental responses, children listed a violent video game as their favorite (Funk et al., 1999).

Not only is violence a dominant theme in current video games, but video game companies are marketing those violent games towards youth. A Federal Trade Commission report (2000) revealed that 70% of the M-rated games (games deemed by the Entertainment Software Rating Board as acceptable for only people 17 or older) were marketed toward children under 17. In addition, 51% of the M-rated game titles researched had at least one advertising plan that deliberately included children under seventeen as a targeting group. Ten of the eleven companies surveyed had documents that included males under seventeen as part of the target audience for their M-rated games.

Not surprisingly, there is a large discrepancy between what the video game industry and what the public considers to be classified as violent. The video game industry and its ratings board (Entertainment Software Rating Board) notice much less violence in video games than do parents (Walsh & Gentile, 2001) and other research groups (Thompson & Haninger, 2001). For example, many games contain cartoon-like violence, (known as mild animated violence) which the ESRB claims are appropriate for all ages (rated "E" for everyone), but parents and even children disagree (Funk, Flores, Buchman, & Germann, 1999). Also, parents prefer ratings systems that address content descriptions of the media while the current media ratings systems only provide age recommendations (Bushman & Cantor, 2003).

Time Spent Playing Video Games and Parental Control

Just as financial aspects of the video game industry have grown, so has time spent playing video games. In the mid 1980s, children spent an average of four hours per week playing video games, both at home and in arcades (Harris &

Williams, 1985). By the mid 1990s, video game usage had risen to 4.5 hours per week for 4th grade girls and 7.1 hours per week for 4th grade boys (Buchman & Funk, 1996).

Recent estimates of video game usage have shown that playing time has increased for both young and older children alike. Children ages two to seven have been found playing video games an average of three to five hours a week (Gentile & Walsh, 2002). School-age children (both boys and girls) spend an average of approximately seven hours per week playing video games (Gentile & Walsh, 2002). These numbers are even higher for slightly older youth, with 8th and 9th grade students reporting an average of 9 hours (13 hours for boys, 5 hours for girls) a week playing video games (Gentile, Lynch, Linder, & Walsh, in press). In 1999, 2.5 percent of entering college men reported playing video games for more than 20 hours per week (CIRP, 1999).

In addition, parental supervision of children's video game use is almost non-existent. Walsh (2000) reported that 89% of teens surveyed said their parents never limited the amount of time spent playing video games. Also, 90% of the youth surveyed in grades 8-12 reported that their parents have never checked the ratings of video games before allowing the youth to purchase them. Only 1% of these youth reported their parents had ever prohibited them from purchasing a video game because of its rating.

LITERATURE REVIEW

Effects of Viewing Media Violence

The vast amount of research conducted on the effects of violent television and movies on aggressive behavior spans several decades. By 1975, eighty studies had been published on the effects of media violence on aggressive behavior. A meta-analysis conducted on these early studies revealed a clear consensus that exposure to media violence (both in the laboratory and in real-life settings) causes increases in aggressive behavior (Bushman & Anderson, 2001). Although the scientific research clearly demonstrated media violence exposure caused increases in aggressive behavior, the news media's coverage of this issue painted quite a different story. Since 1975, while research on media violence has yielded even stronger evidence of causal effects on aggression the news coverage portrayed the media violence effects as weaker than did earlier news reports (Bushman & Anderson, 2001).

Despite how the news media continues to portray the effects of media violence, the research is clear: youth exposed to violent television tend to become more aggressive adults (e.g., Anderson & Bushman, 2002b; Bushman & Anderson, 2001; Hearold,1986; Huesmann, 1994; Huesmann, Moise-Titus, Podolski, & Eron, 2003; Paik, & Comstock, 1994; Wood, Wong, & Chachere, 1991). Viewing violent television and movies causes increases in aggressive cognitions, affect, and behavior. In a recent meta-analysis, Bushman & Anderson (2001) found that the effect of viewing violent television on aggressive behavior is greater than the effect

of being exposed to asbestos on contracting laryngeal cancer, consuming calcium on increased bone mass, or wearing a condom on not contracting HIV.

A moderating effect of exposure to violent television that is relevant to the current research is the effect observable rewards and punishments for violent action. Past studies (Bandura, 1965; Bandura, Ross, & Ross, 1963) have shown that reward and punishment displayed in film can influence viewers' imitative behavior. Bandura (1965) had children view one of three films in which a boy beat on a inflatable "Bobo" doll and was either: rewarded and praised by an adult for his actions, punished and scolded by an adult for his actions, or neither rewarded nor punished for his actions. Each participant was then allowed to play with the same toys used in the film. Researchers recorded how many times behaviors from the film were imitated by each participant. Results showed that there was no difference in the amount of imitative actions between the reward and control conditions. However, participants who viewed the character being punished displayed significantly fewer imitative behaviors than the reward or control conditions.

Bandura, Ross, and Ross (1963) conducted a similar study where children participants viewed one of three films where two boys were interacting. In one film, one boy picks a fight with the other boy and, by force, took all the toys and treats in the room. In the second film, the aggressive boy is punished for his actions and cowers in the corner after being defeated. In the third film, the two boys play together in a non-aggressive fashion. A fourth group of participants did not view any of these films. After viewing the film, each participant was allowed to play with the same toys used in the film. Researchers recorded how many aggressive actions

each participant engaged in. Results found that participants who viewed the aggressor being rewarded for his actions were more likely to imitate his behavior than participants in any of the other conditions. Participants who viewed the aggressor being punished did not differ in imitative behavior from the two control groups. These studies show viewing negative and positive consequences of characters' actions in aggressive media can influence behavior.

Differences Between Violent Television and Video Games

There are several features of violent video games that suggest they may have even more pronounced effects on users than violent TV programs and films. Violent video game players are more actively involved, are more likely to identify with violent characters, are more directly reinforced for violent acts, and are more frequently exposed to violent scenes. One of the focuses of this study is the direct reinforcement for violent actions.

When viewing television or movies, viewers only receive indirect and vicarious rewards for violent actions of the characters (e.g., witnessing a character being rewarded for his or her violent actions) (Geen & Bushman, 1997). When individuals play violent video games, there is direct (and typically instant) reinforcement for their choice of action. This reinforcement can come in numerous forms: visual effects, sound effects (e.g., groans of pain from an injured target), verbal praise (e.g., when a target is killed the computer says "well done" or "impressive"), points for violent actions, and advancing to the next game level after obtaining certain goals. If this direct reinforcement does have an effect on a player's

aggressive behavior, this key difference between video games and television may give reason to believe that violent video games have the potential to be more influential on behavior than violent television.

Effects of Violent Video Games

Because violent video games are a rather new type of violent media, the literature examining its negative effects on players is rather small. However, a clear consensus has already been reached. This consensus is the same reached in the violent television literature: playing violent video games increases aggression. Several studies, both correlational and experimental, have demonstrated that playing violent video games can result in several negative effects on players (Anderson & Bushman, 2001). Recent meta-analyses (Anderson & Bushman, 2001; for updated version, Anderson, 2002) have demonstrated that violent video game exposure increases aggressive behavior, cognition, affect, and physiological arousal, and decreases helping behavior.

Violent video games increase aggressive behavior

Several correlational studies have revealed a positive relationship between playing violent video games and aggressive behavior. For example, Anderson and Dill (2000) showed a positive relationship between violent video game exposure and self-reported aggression on the National Youth Survey, which includes items assessing assault and robbery. Young adolescents who played more violent video games also reported more frequent aggressive behaviors, such as arguing with teachers and getting involved in physical fights (Gentile et al., in press).

Experimental studies have revealed similar results: participants exposed to violent video games behave more aggressively than participants not exposed to violent video games (e.g., Anderson & Dill, 2000; Cooper & Mackie, 1986; Irwin & Gross, 1995; Lynch, Gentile, Olson, & Van Brederode, 2001; Schutte, Malouff, Post-Gorden, & Rodasta, 1988; Silvern & Williamson, 1987). The average effect size across studies between violent game exposure and aggressive behaviors was 0.19 (Anderson & Bushman, 2001). The violent video game exposure effect on aggressive behavior has been found in children and adults, in males and females, and in experimental and non-experimental studies.

Violent video games increase aggressive cognition

There is both correlational and experimental evidence that violent video game exposure increases aggressive cognitions. In a correlational study, young adolescents who reported playing more violent games also had higher hostile attribution biases (Lynch et al., 2001). People with hostile attribution biases have been shown to act aggressively and are often socially maladjusted (Crick & Dodge, 1994). These effects of hostile attribution biases have been found in laboratory settings. Bushman and Anderson (2003) and Kirsch (1998) showed that young adults who played a violent video game generated more aggressive endings to story stems than those who had played nonviolent video games.

Besides hostile attribution biases, aggressive cognitions can be measured in a variety of ways. For example, Anderson & Dill (2000) demonstrated that playing a violent video game increased the relative speed with which the person could read aggression-related words (aggressive thoughts) compared to playing a nonviolent

game. In addition, numerous other studies have demonstrated that after playing violent video games, aggressive thoughts are increased compared to playing nonviolent video games (e.g., Calvert & Tan, 1994; Graybill, Kirsch, & Esselman, 1985; Kirsh, 1998).

Recent meta-analyses have shown the average effect size across studies between violent video game exposure and aggressive cognitions is 0.27 (Anderson & Bushman, 2001). These effects have been found in children and adults, in males and females, and in experimental and non-experimental studies.

Violent video games increase aggressive affect

Empirical studies have demonstrated that playing violent video games can cause increases in aggressive affect. Anderson and Bushman's (2001) meta-analyses found that the effect size of playing violent videogame on aggressive affect is .26. For example, adults' state hostility and anxiety levels were increased after playing a violent game compared to control conditions (Anderson & Ford, 1986). In a study of 3rd through 5th grade children, those who played a violent game demonstrated higher frustration levels than those who played a non-violent game (Funk et al., 1999). Results examining aggressive affect are not clear because nonviolent video games can also cause increases in negative affect by being too difficult, resulting in player frustration.

Violent video games decreases prosocial behavior

Prosocial behavior has been shown to decrease as a result of exposure to violent video games (e.g., Ballard & Lineberger, 1999; Chambers & Ascione, 1987; Silvern & Williamson, 1987; Wiegman & Van Schie, 1998). Carnagey, Bushman and

Anderson (under review, Study 2) showed that participants exposed to a violent video game were slower at providing help to a violence victim than participants exposed to a nonviolent video game. Anderson and Bushman (2001) meta-analyzed eight independent samples and found the average effect of violent video game exposure on helping behavior was -.19.

Violent video games increase physiological arousal

Playing violent video games tends to increase heart rate, systolic and diastolic blood pressure compared to playing non-violent video games (e.g., Murphy, Alpert, & Walker, 1991). The average effect size across studies between violent game exposure and physiological arousal was 0.22 (Anderson & Bushman, 2001). For example, Ballard and Wiest (1996) showed that playing a violent game (*Mortal Kombat* with the blood "turned on") resulted in higher systolic blood pressure responses than playing either a nonviolent game or a less graphically violent game (*Mortal Kombat* with the blood "turned off").

Even though violent video game exposure has been shown to increase physiological arousal, it also has the capacity to cause physiological desensitization to real-life violence. Carnagey et al. (under review, Study 1) demonstrated that participants who had played a violent video game for 20 minutes had lower heart rates while watching scenes of real-life violence than participants who had played a nonviolent video game. This study is the first to demonstrate that violent video games can physiologically desensitize players to observations of real-world violence.

Direct Aggression Versus Displaced Aggression

Despite the numerous studied effects of violent video game exposure, no study has yet compared violent video game effects on direct aggression versus displaced aggression. Direct aggression is defined as a behavior by an individual towards another person who has provoked the individual, whereas displaced aggression is aggression of a provoked individual towards an innocent bystander (Marcus-Newhall, Pederson, Carlson, & Miller, 2000). The concept of displaced aggression can be traced back as far as 1939, when the frustration-aggression hypothesis was presented (Dollard, Doob, Miller, Mowrer, & Sears). Since then, several studies have attempted to determine if displaced aggression actually exists. Evidence has recently been gathered that demonstrates displaced aggression is a reliable phenomenon (Bushman & Baumeister, 1998; Marcus-Newhall, Pederson, Carlson, & Miller, 2000). Certain conditions have also been identified that can increase the probability of displaced aggression occurring. Displaced aggression will occur when an individual is provoked and either (1) the provoker has left the immediate area and is out of reach for retaliation, (2) the source of provocation is intangible (i.e., uncomfortable temperature) or (3) retaliation from the provoker is feared if any direct aggression is taken (Miller, 1941). When any one of these three situations is present, it is suggested that direct aggression is inhibited and aggression will be redirected towards an innocent target.

Another type of displaced aggression that is getting more attention is triggered displaced aggression. Triggered displaced aggression is similar to displaced aggression, except a second provocation, known as the triggering event, occurs (Pedersen, Gonzales, & Miller, 2000). The trigger itself has to have certain

characteristics as well. The trigger is typically: a) from a source that will be the eventual target of aggression (but not the original provoker), b) is a form of minor provocation by itself, c) has different effects based on its intensity (Pedersen, Gonzales, & Miller, 2000). Triggered displaced aggression is considered to have more external validity because in everyday life, the target of the aggression is usually responsible for the triggering provocation (often a trivial action) and the aggressor feels that his or her actions of retaliation are justified.

Although there have been several violent video game studies that have measured direct aggression, none have specifically measured displaced aggression. Anderson and Murphy (in press) had participants play either a violent or nonviolent video game and then angered participants by inducing them to believe a partner was blasting noise in their ears during a computer task, then allowed the participants to retaliate. Participants who played the violent game issued, on average, higher intensities of noise to their partners. This study has the provocation component, but allows the participants to aggress against their provoker, lacking a necessary condition for displaced aggression to occur.

Other studies have had participants play a violent or nonviolent video game, then place the participants in some kind of teacher/learner activity. In these studies, the participant is always the teacher and is allowed to issue some form of noxious stimuli toward their partner. Ballard and Lineberger (1999) found that participants who played a violent video game immersed a female opponent's hand in cold water longer than participants who played a nonviolent video game. In this study,

participants aggressed against an innocent individual, but the participants were not provoked so the action could not be classified as displaced aggression.

Based on the current video game and television literature, it seems reasonable that playing violent video games can cause increases in direct aggression and displaced aggression. The violent television literature (Bandura, 1965; Bandura, Ross, & Ross, 1963) also suggests that violent video games that reward players for killing innocent bystanders in life-like scenarios should increase the amount of aggression in the player compared to games that punish the player for killing bystanders. But even if this sounds reasonable, how can it be explained in theoretical terms?

The General Aggression Model: A Theoretical Explanation

A theory developed in recent years that can be used to understand the media violence research is the general aggression model (GAM; see Anderson & Bushman, 2002a; Anderson & Huesmann, in press). GAM is an integration that combines key ideas from earlier models: social learning theory and related social cognitive theory concepts (e.g., Bandura, 1971, 1973; Bandura, Ross, & Ross, 1961, 1963; Mischel 1973; Mischel & Shoda, 1995), Berkowitz's cognitive neoassociationist model (1984, 1990, 1993), Dodge's social information-processing model (e.g., Crick & Dodge, 1994; Dodge & Crick, 1990), Geen's affective aggression model (1990), Huesmann's script theory (Huesmann, 1986), and Zillmann's excitation transfer model (1983). GAM describes a cyclical pattern of interaction between the person and the environment. Three main points compose

the cycle: *input variables* of person and situation, *present internal state* of the individual, and *outcomes* resulting from various appraisal and decision processes.

Input variables

According to GAM, a person's behavior is based on two main kinds of input variables: the person and the situation (see Figure 1). The person variables are all the factors a person brings with him or her into the current situation, including traits, current states, beliefs, attitudes, values, sex, scripts, and aggressive personality. Situation variables are simply the environmental factors surrounding the individual that could affect the person's actions, like aggressive cues, provocation, pain, rewards, and frustration.

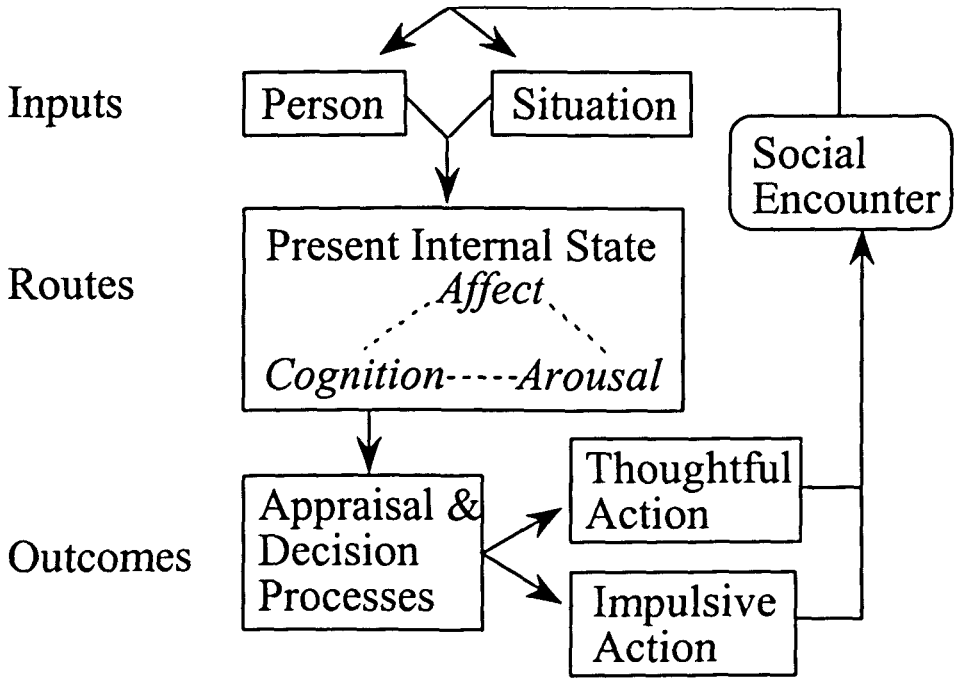

Figure 1. The general aggression model episodic processes (Anderson & Bushman, 2002a)

Routes

Input variables, sometimes interactively, affect an individual's appraisal of a situation and ultimately affect the behavior performed in response to that appraisal, primarily by influencing the individual's present internal state. According to GAM, these influences occur through three main routes of the present internal state: cognition, affect, and arousal.

Cognition

Input variables can influence internal states by causing aggressive constructs to be more accessible in memory. Constructs can be either temporarily or chronically accessible (e.g., Bargh, Lombardi, & Higgins, 1988; Sedikides & Skowronski, 1990). When a construct is repeatedly accessed, its activation threshold decreases. A decrease in activation threshold results in a lower energy requirement necessary for activation, making it chronically accessible. A situational input (e.g., a violent film) results in a temporary lowered activation threshold, making the construct accessible for a short time. This temporary increase in accessibility of a construct is often called "associative priming." Situational variables can also activate aggressive scripts (Huesmann, 1986). Aggressive scripts can bias the interpretation of a situation and indirectly alter the possible responses to that situation. Repeated access of aggressive scripts can also make the scripts more readily accessible and more likely to be activated in future situations, guiding future behavior.

Affect

Input variables can also influence the present internal state through affect, which in turn can impact future behavior. For example, pain and uncomfortable temperatures can increase state hostility (anger) and general negative affect (C. Anderson, Anderson, & Deuser, 1996; K. Anderson, Anderson, Dill, & Deuser, 1998). Exposure to violent movies, TV, or video games can also increase state hostility (Anderson, 1997; Anderson & Bushman, 2001; Bushman, 1995; Bushman & Geen, 1990; Bushman & Huesmann, 2001; Hansen & Hansen, 1990). Besides situational variables, personality variables are also related to hostility-related affect. It has been shown that self-reported trait hostility is positively related to state hostility (Anderson, 1997; K. Anderson et al., 1998).

Arousal

The final route of the present internal state is arousal. Arousal can influence the present internal state in a number of ways. Increasing arousal can strengthen an already present action tendency, which could be an aggressive tendency. For example, if the person has been provoked at the time of increased arousal, aggression is more likely to be an outcome than if the increase in arousal did not occur. Geen and O'Neal (1969) demonstrated this by showing that a loud noise increased arousal and aggression. A second way in which arousal could increase aggression is explained within excitation transfer theory (Zillmann, 1983). Arousal elicited by other sources (e.g., exercise) may be misattributed as anger in situations involving provocation, thus increases the chances of producing an anger-motivated aggressive behavior. A third, and untested, way is that unusually high and low levels

of arousal could be aversive and stimulate aggression in a similar manner as other aversive stimuli (Anderson & Huesmann, in press; Geen & Bushman, 1997).

Interaction between routes

Not only can input variables influence cognition, affect, and arousal, but these three routes can also influence one another. The idea that cognitions and arousal influence affect dates all the way back to William James (1890) and was again examined by Schachter & Singer (1962). Affect has also been shown to influence both cognition and arousal (Bower, 1981). Research has shown that people often use their affective states to guide inference and judgment processes (Forgas, 1992; Schwarz & Clore, 1996). Thus, hostility-related affect may cause hostile cognitions to become more accessible, and vice versa.

Outcomes

Typically, an individual will appraise the current situation and then select an appropriate behavior before it is emitted. Depending on the situational variables and resources available to the individual, appraisals may be made hastily and automatically, without much (or any) thought or awareness, resulting in an impulsive behavior. However, frequently the individual will have the necessary time and resources to reappraise the situation and perform a more thoughtful action. Of course, both impulsive and thoughtful actions can be aggressive or nonaggressive.

This action performed by the individual will then be followed by a reaction from the environment (typically other people's response to the action). This social encounter can influence input variables, depending on the environmental response. This encounter could modify situation variables, person variables, or both, resulting

in a reinforcement or inhibition of similar behavior in the future (Anderson & Bushman, 2002a).

Applying GAM to media violence

GAM can be used to interpret and predict the effects of exposure to violent media. Theoretically, violent media exposure can affect all three components of present internal state. As mentioned earlier, research on violent video games has shown that playing them can temporarily increase aggressive thoughts, affect, and arousal (Anderson & Bushman, 2001). Also noted earlier, exposure to violent video games can reduce arousal to subsequent depictions of violence. Playing a violent video game can also influence the person's internal state through the affective route by increasing hostile affect and through the arousal route by increasing heart rate (Anderson & Bushman, 2001).

Despite's GAM's primary focus on the episode, it is not restricted to short-term effects. The cyclical process of GAM lends itself to explaining long-term effects of exposure to media violence. With repeated exposure to certain stimuli (e.g., media violence), particular knowledge structures (e.g., aggressive scripts) become more readily accessible. Figure 2 displays this process and several common types of long-term changes that may occur. Over time, the individual will employ these knowledge structures and possibly receive environmental reinforcement for their usage. With time, these knowledge structures become strengthened and are more likely to be used in later situations. Research supports this notion by demonstrating that repeatedly exposing children to media violence produces aggressive adults (Huesmann & Miller, 1994, Huesmann et al., 2003). Such long-term effects result

from the development, automatization, and reinforcement of aggression-related knowledge structures. In essence, the creation and automatization of these aggression-related knowledge structures along with desensitization effects change the individual's personality. For example, long-term consumers of violent media can become more aggressive in outlook, perceptual biases, attitudes, beliefs, and behavior than they were before the repeated exposure, or would have become without such exposure.

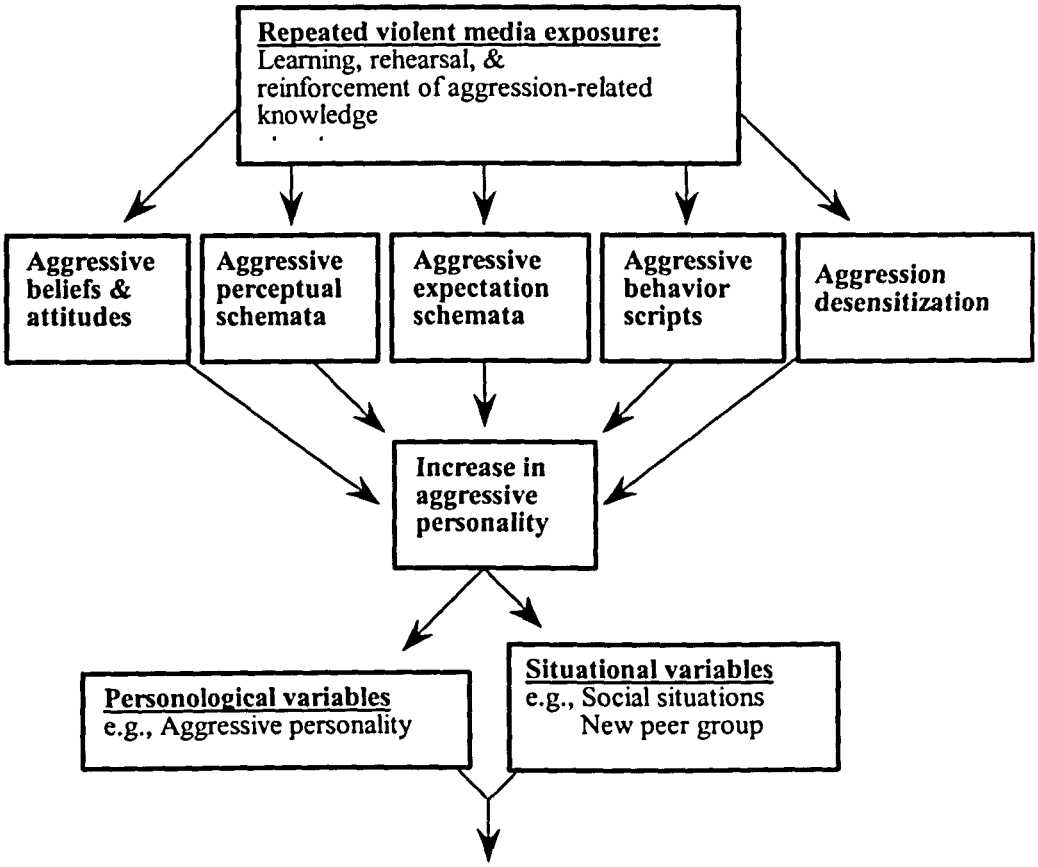

Figure 2. The general aggression model: Personality processes (Anderson & Bushman, 2002a)

Current Study

The present study takes an experimental approach to examining the effects of violent video games on both direct and displaced aggression. The primary purpose of this study was to gain a better understanding on the effects of reward and punishment for violent actions within a video game on aggressive behavior. The secondary purpose was to examine whether displaced aggression increases as a result of playing violent video games.

Undergraduates enrolled in introductory psychology at a large Midwestern university participated in this study for course credit. This experiment tested the relation between varying amounts of reward and punishment for violent actions in violent video games and later aggressive behavior. To test this relationship, four versions of a car racing video game were used. The four versions were: 1) killing bystanders and race opponents was rewarded, 2) killing bystanders was punished and killing race opponents was rewarded, 3) all violent action was punished, and 4) nonviolent. The design of the study was a 2 (sex: men, women) X 2 (target of aggression: bystander, provoker) X 4 (video game version) between subjects design.

First, every participant completed an essay on a controversial topic. Next, each participant was randomly assigned to play one of the four video game versions for twenty minutes. Then all participants received severe negative feedback on their essay (provocation) by another participant. After receiving the negative feedback, each participant was given the opportunity to aggress against either the person responsible for the provocation (direct aggression) or another participant who was

not responsible for the negative feedback, but provoked him or her slightly on a computer task by issuing bursts of static into the participant's headphones (triggered displaced aggression).

There were several hypotheses addressed by this study. First, results were expected to show a main effect of game version on aggressive behavior. Specifically, this main effect should demonstrate that participants exposed to the all violence rewarded condition should be the most aggressive, followed by the violence rewarded and punish condition, followed by the all violence punished condition and the nonviolent game condition. Second, it was expected that there would be a main effect for target of aggressive behavior. Participants who were allowed to aggress against their provoker would behave more aggressively than participants who were allowed to aggress against a bystander. Third, it was expected that trait aggressiveness would be positively related to laboratory aggression. Finally, it was expected that a regression analyses would reveal a relationship between previous violent video game exposure and trait aggressiveness.

METHODS

Participants

Participants in this study were 415 undergraduate students (206 men, 209 women) enrolled in introductory psychology courses. Students were selected at random from a larger pool of students who had completed the Physical Aggression Subscale of the Aggression Questionnaire (Buss & Perry, 1992; see Appendix B) and the Video Game Exposure Questionnaire (Anderson & Dill, 2000; see Appendix B) as part of a battery of tests included in mass-testing sessions. The Physical Aggression Subscale formed an internally consistent scale (coefficient α = .88). Participants' scores on this subscale will be referred to as trait aggressiveness. The Video Game Exposure Question also showed acceptable consistency (coefficient α = .70). Participants received course credit towards their psychology class for their voluntary participation

Design

This experiment examined the effects of video games with varying amounts of reward for violent actions on both direct aggression and displaced aggression. Four versions of the video game Carmageddon 2 were used in this study. The four versions were: 1) killing bystanders and race opponents was rewarded, 2) killing bystanders was punished and killing race opponents was rewarded, 3) all violent action was punished, and 4) nonviolent. The design of the study was a 2 (sex: men, women) X 2 (target of aggression: bystander, provoker) X 4 (video game version) between subjects design.

Materials

Video games

One violent video game was used in this study. The original game, as well as three re-programmed versions of the game were used. The violent video game used in this study was Carmageddon 2. In this racecar game, the objective was to kill all of your opponents (other vehicles) by ramming them until they explode. Players were awarded points depending on how hard they struck another vehicle (awards range from 100 to 2000 points). Another objective of Carmageddon 2 was to run over as many pedestrians as possible. Four versions of Carmageddon 2 were used in this study. The first version was an unaltered form of the original game. Players were awarded points for destroying their opponents and killing as many pedestrians as possible. When a player ran over a pedestrian, a sign appeared on the screen that alerted them they gained "300 Credits." Players could earn more than 300 credits for running over a pedestrian if they used extreme brutality. For instance, if a player killed a pedestrian by slamming he or she into a wall, they earned a "Piledriver Bonus" which gave them 600 credits. Players could also pick up a variety of power-ups during the game. These power-ups gave players special powers, such as turbo speed and extra armor. There were also power-ups that altered the dynamics of car-pedestrian interaction. For example, if a player picked up an "Exploding Pedestrian" power-up, for the next thirty seconds every time a pedestrian was ran over, he or she exploded on impact and earned the player a "Splatter Bonus." Players advanced to the next level of the game when they completed all the laps or killed all their racing opponents.

The second version of Carmageddon 2 was similar but differed on two main factors. This original version was altered so that a player was punished for running over pedestrians. In this version, when a player ran over a pedestrian, a screen appeared that read, "Lose 300 Credits." Also, a player lost even more credits if he or she used extreme brutality. For example, if a player slammed a pedestrian into a wall, a screen appeared that read, "Lose 600 credits." Power-ups concerning pedestrians were removed from this version and replaced by power-ups that issued a random number of credits. Players advanced to the next level of the game when they completed all the laps or killed all their racing opponents.

The third version of Carmageddon 2 was identical to the second version except that players also lost points for hitting other vehicles. Point deductions were identical in value to that of points earned for hitting vehicles in the first and second versions (deductions for hitting vehicles ranged from -100 to -2000 points). This version punished players for any violent actions, whether it was against their opponents who tried to hit them or against pedestrians on the street. Players advanced to the next level only when they completed all the laps.

The fourth version of Carmageddon 2 was constructed to resemble a nonviolent video game. All pedestrians were removed from the nonviolent version. Computer controlled vehicles were reprogrammed to behave more passively than in previous version. Finally, adjustments were made in the programming that only allowed players to receive points for passing checkpoints on the racetrack. Players advanced to the next level only when they completed all the laps.

All games were played on a Gateway 2000 computer with a 12" color monitor and a NASCAR Pro Digital 2 steering system. The purpose of the steering wheel was to make the games more realistic and assist the most inexperienced players to complete more of the game than if they used an unfamiliar joystick.

Competitive reaction time task

An altered version of the Taylor Competitive Reaction Time (CRT) task was used to measure aggressive behavior. The CRT is a widely used and externally valid measure of aggressive behavior (see Anderson & Bushman, 1997; Anderson, Lindsay, & Bushman, 1999; Bushman & Anderson, 1998; Carlson, Marcus-Newhall, & Miller, 1989; Giancola, & Chermack, 1998). The CRT is a game in which participants are induced to believe that they were competing with another participant to see who could press a mouse button faster after hearing an auditory cue. In the standard version of this computer task, the "loser" of each trial received a burst of white noise. The opponent supposedly was responsible for the selected intensity and duration. The scale of intensities the participants could choose from had eleven levels, ranging from no noise (level 0), 60 decibels (level 1), through 105 decibels (level 10). Each level (1-10) increased by 5 decibels over the previous level. Participants also chose the duration of the noise by holding down the mouse button for the length of time they wanted their opponent to hear the noise. Participants selected the intensity level and the duration of the noise they wanted their opponent to hear prior to each of the 25 trials. These selections constituted the measure of aggressive behavior.

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In reality there was no other partner. A pattern of wins and losses was constructed in the program, which predetermined whether the participant won or lost a particular trial (to view all the entire win-loss pattern and the pre-selected intensities and durations, see Table 1). All participants won 13 trials and lost 12 trials, as long as they responded within 750 milliseconds. Participants automatically lost the trial if they were slower than 750 milliseconds, regardless if it was designated as a win trial. During the lose trials, participants were presented with two noise bursts of levels 2, 4, 5, 7, 8, and 9. The noise durations were also pre-set and ranged from 0.5 seconds to 2.5 seconds, with increments of 0.25 seconds. The computer recorded participants' selections of intensity and duration for each trial. These noise blasts were intended for the participant's partner and were the measure of aggression in this study.

Procedure

When each participant arrived for his or her individually scheduled session, the experimenter greeted the participant and informed consent was obtained. The consent form notified the participant that the study concerned impression formation and the participant would form impressions of two other participants after engaging in a variety of tasks with them. Course credit was also issued to the participant at this time. The experimenter then took a picture of the participant with a digital camera. The participant was told that the picture would be given to the other participants and he or she would receive photos of each of his or her partners, to assist him or her in forming impressions of them.

The experimenter seated the participant at a table with two computers in a single person cubicle. The participant was told that he or she had two partners to interact with; one through writing tasks (essay partner) and one through other tasks (non-essay partner). One of the other tasks was playing the same video game as non-essay partner and exchanging evaluations of the game. The participant was told he or she would form impressions of his or her partners at the end of the session. The experimenter gave instructions for the CRT, including giving him or her noise bursts of 1, 5 and 9 intensities (this way participants had an idea of the noise levels they would give to his or her "partner" later in the session).

The experimenter then instructed the participant to write a brief essay on the issue of the abortion. The participant was asked to choose either pro-life or pro-choice depending on which side the participant supported. The experimenter informed the participant that the essays would be exchanged between him or her and the writing partner (participants were told that their partners were the same gender as themselves), each would evaluate the other's essay, and evaluations would be exchanged. The participant was left alone in the cubicle for five minutes to write the essay.

After five minutes, the experimenter returned with two black and white images of the other "partners" (standard photos were shown to all participants). For each gender, one picture contained a person with blond hair and the other contained a person with brown hair. Photos were randomly assigned during each lab session to represent either the essay partner or the non-essay partner. The experimenter hung the pictures in the cubicle and took the written essay from the participant. The

experimenter left and returned shortly with another handwritten essay. The participant was told it was the essay written by the essay partner (in reality it was a standard essay issued to all participants). The essay endorsed the participant's opposite viewpoint of abortion (e.g., if the participant endorsed pro-life, then he or she would receive a pro-choice essay from the essay partner). The experimenter also gave the participant an essay evaluation form (see Appendix B). This evaluation form asked the participant to rate the partner's essay, from a scale of -10 to +10, on the following dimensions: organization, originality, writing style, clarity of expression, persuasiveness of arguments, and overall quality of essay. There was also space at the bottom of the form for extra open-ended comments. The experimenter left the participant in the cubicle to read and evaluate the essay.

The experimenter returned and instructed the participant on how to play the video game. The participant was informed that after playing the video game, he or she would fill out an evaluation of the game and exchange evaluations with the non-essay partner, who played the same game. The participant played a randomly assigned video game for twenty minutes. The experimenter watched the participant's gameplay from a separate monitor and recorded the total number of points earned and the number of pedestrians killed (body count) in the twenty minute session. The participant was unaware the experimenter was viewing his or her gameplay. After twenty minutes, the experimenter returned and gave the participant the essay evaluation form from the essay partner. This form was completed in a very harsh manner, criticizing the participant's writing skills and quality of arguments. The evaluation was completed in the following manner: organization, -9; originality, -10;

writing style, -10; clarity of expression, -9; persuasiveness of arguments, -9; and overall quality of essay, -10 (recall -10 was the lowest rating possible). In addition, a hand written comment appeared at the bottom of the evaluation which stated, "This is the worst essay I have ever read!!" This procedure has been used successfully in prior research (e.g., Bushman & Baumeister, 1998; Bushman, Baumeister, & Stack, 1999; Bushman, Baumeister, & Phillips, 2001).

After the participant read the evaluation, he or she completed a session of the competitive reaction time task. Depending on the condition, the participant believed he or she was competing against the person who wrote the evaluation (direct aggression) or against another participant who did not write the evaluation (displaced aggression). The participant won 13 of the 25 trials. The computer recorded the participant's selection of noise intensities and durations intended for his or her partner. This is the same procedure used successfully in other displaced aggression studies (e.g., Bushman & Baumeister, 1998; Bushman, Baumeister, & Stack, 1999).

After the participant completed a session on the competitive reaction time task, the participant completed a video game evaluation form (see Appendix B). This evaluation form asked the participant to evaluate the video game, on a ten-point scale, on a variety of characteristics such as arousing, frustrating, enjoyable, and violent. After completion, the partner received a game evaluation from the non-essay partner (pre-testing means were hand written in the evaluation) and was asked to review the opinions of the single player game. During this time the participant also completed two partner evaluation forms (see Appendix B), which asked the

participant to rate a variety of statements concerning his or her partners on a 1 (Strongly Disagree) to 10 (Strongly Agree) scale (e.g., "I like my partner", "I think my partner is intelligent", "I think my partner is a good person"). Finally, the participant was thoroughly probed for suspicion and debriefed. Suspicion was assessed using a funnel debriefing procedure. The experimenter conducted a structured interview designed to detect suspicion as well as to ease into the debriefing. Opening questions were general in nature (e.g., "What did you think of the study?") and became more specific in nature (e.g., "Did you think that the video game & CRT were connected?"). Participants responses were recorded verbatim. Finally, the experimenter read the participant a one page debriefing statement, informing him or her that there were no other participants and the study was actually examining the relationship between violent video game exposure and aggression. The author examined each participant's responses and coded them on a 3-point scale. Participants receiving a "1" expressed no suspicion or were slightly curious about the lab with no specific suspicious thoughts. Participants who received a "2" rating stated they wondered if they really had partners in the study. Participants who received a "3" rating specifically stated they knew they did not have any partners or that the study was concerning the effect violent video games and aggressive behavior (the general hypothesis). Three hundred thirty two participants received a suspicion rating of one. Forty-nine participants received a suspicion rating of two. Thirty-two participants received a high suspicion rating of three.

RESULTS

Preliminary Analyses

Aggressive behavior

On every trial of the competitive reaction time task (CRT), participants had the option of issuing their "partner" a noise intensity of eleven levels, ranging from no noise (level 0), 60 decibels (level 1), through 105 decibels (level 10). Participants also had the option of selecting the duration of the chosen intensity for each of the trials. Duration scores in this sample resulted in a skewed distribution (skewness of 5.37). To correct for this skewness, the square root of each duration score was taken (skewness reduced to 1.30). A trial score was then calculated for each of the 25 trials by taking the square root of the duration multiplied by the intensity (also known as an "energy" score). An aggression score was calculated by averaging the energies set immediately after participants lost a trial and received a burst of white noise (lose aggression). This procedure of examining the lose trials has been shown to be a valid measure of aggression (Anderson & Dill, 2000). Calculating energies has also been shown to be a valid measure of aggression, by taking both the intensity and duration of each trial into account (Bartholow, Anderson, Carnagey, & Benjamin, 2003).

Characteristic differences between video games

After playing one of the four video games, participants rated the game on several characteristics. These characteristics were: difficult, absorbing, action-packed, arousing, boring, enjoyable, entertaining, exciting, frustrating, fun, involving,

stimulating, violent, and addicting. Participants rated the game on each of these characteristics using a 1 (strongly agree) to 10 (strongly disagree) scale. A principle components factor analysis was conducted on all game characteristics, except violence, to determine what factors would emerge. Both oblique (Harris-Kaiser rotation) and orthogonal analyses (varimax rotation) were conducted. Difficult, boring, and frustrating were reverse scored before analysis. Based on examination of the scree plot and the eigen value of one criteria, two factors resulted from these analyses. Factor 1, which will be referred to as "game action", contained the characteristics of: absorbing, action-packed, arousing, boring, enjoyable, entertaining, exciting, fun, involving, stimulating, and addicting. The action sub-scale formed an internally consistent scale (coefficient α = .94). The second factor that emerged will be referred to as "game ease". This game ease sub-scale included the items difficult & frustrating. This subscale formed an internally consistent scale (coefficient α = .70). These two sub-scales will be used to control for any potential characteristic differences between game conditions.

Main Analyses

Data analysis strategy

Two planned contrasts were conducted to examine the effect of game on aggression, after controlling for main effects of trait aggressiveness, violent video game exposure, game ease, game action, and any interactions with game version. Any variables and interactions that are not significant will be dropped from the models. The first contrast consisted of a linear contrast that tested for incremental decreases in aggression from game 1 (reward all violence) through game 4

(nonviolent) (contrast weights for game 1 through game 4: 3, 1, -1, -3). The second contrast was conducted to test whether there was a significant difference between the all violence rewarded game and the nonviolent game (contrast weights: 1, 0, 0, -1).

Aggressive behavior

Aggressive behavior was analyzed with a 2 (sex: male vs. female) X 2 (target: provoker vs. bystander) X 4 (game version: all violence rewarded, pedestrian violence punished & opponent violence rewarded, all violence punished, nonviolent) ANCOVA, after controlling for trait aggressiveness, game ease, game action, and violent video game exposure. Violent video game exposure and game action had no significant effects on aggressive behavior and were dropped from the equation. Men were more aggressive than women, *M*s = 147.2 and 111.2, $F(1, 378) = 8.66$, $p < .01$, $d = 0.33$. Trait aggressiveness was related to aggression, $F(1, 378) = 16.58$, $p < .0001$, $b = 25.5$. There was also a game ease x game version interaction, $F(3, 345) = 4.22$, $p < .02$. There was also a moderately significant sex X target X game version interaction, $F(3, 378) = 2.41$, $p < .07$. To make sense of the three-way interaction, further analyses were broken down by target.

Displaced aggression

Aggressive behavior towards a bystander was analyzed with a 2 (sex) X 4 (game version) ANCOVA, after controlling for trait aggressiveness, violent video game exposure, game ease, game action, and game version X game action

interaction. Game ease and violent video game exposure were not significant predictors of aggressive behavior, so they were dropped from the statistical model. The only significant effect was a main effect of sex. Men were more aggressive than women, $F(1, 173) = 12.11$, $p < .001$, d = 0.57. Two planned contrasts were conducted to determine the effect of game version on displaced aggression. The linear contrast was not significant, $F(1, 186) < 1$, $p > .05$. The second contrast was also not significant, $F(1, 186) < 1$, $p > .05$. It appears that game version did not have an effect on participants' aggression towards an innocent bystander. Due to the unexpected findings, the rest of the results will examine direct aggression.

Direct aggression

Direct aggression was analyzed with a 2 (Sex) X 4 (Game Version) ANCOVA, after controlling for trait aggressiveness, game ease, game action, and violent video game exposure. Game ease and violent video game exposure were not significant predictors of aggressive behavior, so they were dropped from the statistical model. Trait aggressiveness was a predictor of direct aggression, $F(1, 187) = 16.86$, $p < .0001$, $b = 32.2$. There was also a significant game version X game action interaction, $F(3, 187) = 2.86$, $p < .04$. Two planned contrasts were used to test the effect of game on direct aggression, after controlling for trait aggressiveness and game action, and game version X game action interaction. The linear contrast was significant, $F(1, 187) = 4.47$, $p < .04$ (see Figure 3). The second contrast (all reward game vs. nonviolent game) was also significant, $F(1, 187) = 5.44$, $p < .03$. Game version did have the predicted effects on participants' direct aggression. Participants

were more aggressive depending on whether violent actions were rewarded or punished in the video game they played. Participants who were rewarded for all violent actions were the most aggressive. Participants only partially rewarded for violent action and participants were who punished for all violent action were less aggressive than the participants in the all violent actions rewarded condition. Participants who played a nonviolent video game were the least aggressive group.

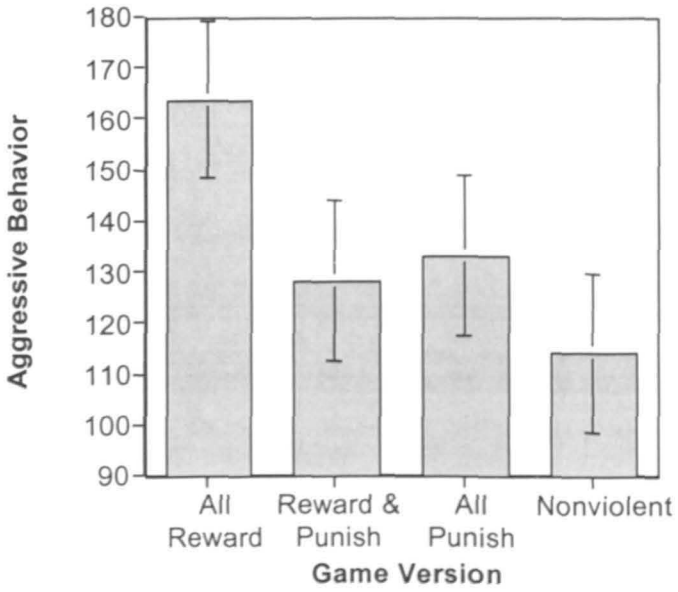

Figure 3. Aggressive behavior against a provoker as a function of video game version exposure. Capped vertical bars denote 1 SE.

To examine the game version X game action interaction more closely, aggressive behavior was analyzed by generating four best fit regression lines relating action to aggression, one for each game condition, controlling statistically for trait aggressiveness (see Figure 4).

For the all violence rewarded game version, game action was positively related to aggressive behavior, $F(1, 49) = 5.94$, $p < .02$, $b = 44.4$ (see Figure 4). For the pedestrian violence punished & opponent violence rewarded version, game action was not related to aggressive behavior, $F(1, 46) = 1.42$, $p > .05$, $b = -20.4$. For all violence punished game version, game action was also not related to aggressive behavior, $F(1, 47) = 1.62$, $p > .05$, $b = 16.3$. For the nonviolent game version, there was again no relation to game action and aggressive behavior, $F(1, 46) = 0.28$, $p > .05$, $b = 6.5$. According to these analyses, participants who played the all violence rewarded game were more aggressive when they rated the game as containing more action. This could be due to the action in the violent game was typically violent action (especially in all violence rewarded version). Thus the more reported action, the more violence the player was likely exposed to. Game action was not significantly related to aggressive behavior in any of the other game conditions (slopes were not significantly different from zero).

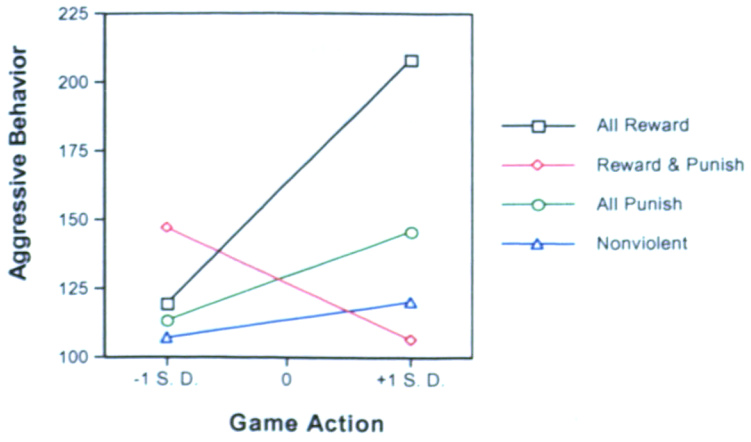

Figure 4. Aggressive behavior against a provoker as a function of game action within each video game version.

One possibility of the relation between game action and aggressive behavior in the all violence rewarded video game is that as participants completed more of the game, they killed more pedestrians and witnessed more violence. As players witness more violence, they may rate the game as containing more action. The action reported in the all violence rewarded game was positively related to body count in the all violence rewarded game, $F(1, 52) = 2.78$, $p = .10$, $b = 67.2$. In the reward and punish game, action was not related to body count, $F(1, 48) = 0.43$, $p > .10$, $b = -1.4$. For the all punish game, action was also not related to body count, $F(1, 49) = 0.01$, $p > .10$, $b = -0.2$. These results suggest that for the all violence rewarded game, participants who rated the game as having more action, witnessed more violent action (e.g., killing pedestrians). For the other two violent games, this was not the case. These differences could be attributed to the rules of the games. For the all violence rewarded game, killing pedestrians was one of the main objectives. Participants who fulfilled this objective more than others were more likely to state that it had more action. For the other two violent games, avoiding pedestrians was an objective. Thus, participants were actively trying to avoid pedestrians. The fewer pedestrians a player hit in these games, the more likely they were to complete the other objectives of the game (e.g., race around the track, destroy vehicular opponents). These results give indirect support that body count was tied to the amount of action reported in the different game versions, and was influencing aggressive behavior. However, to directly test this hypothesis, a mediation test must be conducted.

Body count as a mediator of aggression

To test the hypothesis that the difference in body count could be mediating the effects of video game condition on aggressive behavior, procedures proposed by Baron and Kenny (1986) were used. According to Baron and Kenny, mediation can be demonstrated by a) showing the manipulation had the expected effect on the criterion variable (aggression), b) showing that the manipulation had the expected effect on the mediator (body count in the video game), and c) showing that after statistically controlling for the mediator (body count) reduces or eliminates the expected manipulation on the criterion variable (aggression).

Because the nonviolent condition contained no pedestrians for players to kill, a separate contrast on laboratory aggression must be conducted. A contrast comparing the all violence rewarded game version against the reward and punish game version and the all punish condition was conducted on laboratory direct aggression (contrast weights: 2, -1, -1, 0). This contrast was moderately significant, $F(1, 200) = 3.55$, $p > .07$ (step "a" is satisfied). A 2 (sex) X 4 (game) ANOVA was conducted on body count. There was a significant effect of game, *M*s = 67.7, 20.9, 20.9, and 0.0, $F(3, 198) = 148.65$, $p < .0001$. Also, men had higher body counts than women, *M*s = 32.2 and 23.8, $F(1, 198) = 16.84$, $p < .0001$, $d = 0.27$. These main effects were qualified by a sex X game interaction, $F(3, 198) = 3.79$, $p < .02$. The contrast comparing the all violence rewarded game version against the reward and punish game version and the all punish condition was also significant, $F(1, 198) = 263.59$, $p < .0001$ (criterion "b" is satisfied). Finally, another contrast was conducted on the effect of game version on direct aggression, after controlling for body count. If

body count did mediate the game effect on direct aggression, adjusted means used in the contrast should make the contrast nonsignificant (or less significant). After controlling for body count, the contrast became insignificant, $F(1, 182) = 0.46$, $p > .40$ (adjusted *Ms* for violent game conditions: 156.6, 132.5, and 139.4). This mediation test supports the hypothesis the amount of pedestrians killed by players was a significant mediator of aggressive behavior. There has been evidence that the Baron & Kenny (1986) procedure is a low power technique (McKinnon, et al., 2002). This would suggest that the procedure conducted is a conservative estimate of mediation.

Participant suspicion

Due to the heavy amount of media coverage on media violence, participants high in suspicion could cloud the results of the study. In aggression paradigms, highly suspicious subjects have been shown to distort or hide the effects of interest (Carlson, Marcus-Newhall, & Miller, 1990; Turner, Simons, Berkowitz, & Frodi, 1977). To determine if highly suspicious participants behaved differently than non-suspicious participants, direct aggression was reanalyzed using a 2 (sex) X 4 (game version) ANOVA with suspicion as a covariate. A significant game X suspicion interaction was found, $F(3, 196) = 2.65$, $p < .05$.

To analyze this game version X suspicion interaction further, aggressive behavior was analyzed by generating four best fit regression lines relating suspicion to aggression, one for each game condition. For the all violence rewarded game, the more suspicious a participant was, the less aggressive they were, $F(1, 52) = 2.47$, $p > .05$, $b = -49.6$. For the reward and punish game, participants who were more

suspicious were also less likely to be aggressive, $F(1, 48) = 1.35$, $p > .05$, $b = -34.4$. For the all violence punished game, the more suspicious a participant was, the more aggressive he or she behaved, $F(1, 51) = 4.10$, $p < .05$, $b = 43.5$. For the nonviolent game, suspicion didn't have an effect aggressive behavior, $F(1, 49) < 1$, $p > .05$, $b = -2.6$. These results suggest that highly suspicious subjects, who were aware of the main hypothesis, may have been trying to behave in the opposite manner than the hypothesis, possibly to sabotage the results. Specifically, if highly suspicious participants wanted to sabotage the study, they should show relatively little aggression when playing the all violence rewarded condition and relatively high aggression in the all violence punish condition (which they do). It is less obvious what they should do in the other two video game conditions.

Although suspicion was a significant covariate on aggressive behavior, when other predictor variables (trait aggressiveness and game action) were entered into the model, the suspicion by game interaction became nonsignificant, $F(3, 183) = 2.29$, $p > .08$. The main effect of suspicion on aggressive behavior was also nonsignificant, $F(3, 183) = 0.16$, $p > .69$. For this reason, no participants were deleted from the data set due to suspicion.

Verbal aggression

Before participants were debriefed, they completed an impression formation questionnaire for both the provoking partner and the bystander partner on a variety of positive characteristics. Participants were instructed that their partners would view these evaluations before leaving the experiment. Questions were reversed scored before analysis. A higher score on the questionnaire indicates higher verbal

aggression. Verbal aggression against the provoker and the bystander was analyzed using a 2 (sex) X 4 (game version) ANOVA, after controlling for trait aggressiveness and game action. For verbal aggression against a provoker, neither game nor sex were significant predictors of aggression, $Fs < 1$, $ps > .05$. The only significant predictor was trait aggressiveness $F(1, 185) = 9.91$, $p < .05$, $b = 0.23$. For aggression against a bystander, there were also nonsignificant effects of game and sex, $Fs < 1$, $ps > .05$. Trait aggressiveness was only moderately related to verbal aggression against a bystander, $F(1, 185) = 3.14$, $p < .08$, $b = 0.12$. It appears that the manipulation of game did not affect how verbally aggressive participants were toward their partners.

Nonlaboratory variable analysis

Information concerning several variables were collected before the experimental session began. These variables were unique in that they are non-incumbent to experimental manipulations. The criterion variable of interest is trait aggressiveness. Possible predictor variables are violent video game exposure, overall video game exposure, and sex. Several of these relations are note-worthy. Men were higher in trait aggressiveness than were women, *M*s = 3.5 and 2.3, $F(1, 397) = 109.3$, $p < .0001$, $d = 1.04$. Men also had more violent video game exposure (*M*s = 9.3 and 2.2, $F(1, 413) = 107.1$, $p < .0001$, $d = 1.02$) and more overall video game exposure than did women (*M*s = 2.5 and 1.8, $F(1, 412) = 25.3$, $p < .0001$, $d = 0.50$). Violent video game exposure, regardless of sex, was positively related to trait aggressiveness, $F(1, 397) = 57.2$, $p < .0001$, $b = 0.35$. This relationship still existed when sex was partialled out. Men who had higher levels of violent video game

exposure were more trait aggressive $F(1, 194) = 6.95$, $p < .01$, $b = 0.17$. Women who reported higher violent video game exposure were also more trait aggressive $F(1, 201) = 4.0$, $p < .05$, $b = 0.20$. Overall video game exposure was also related to trait aggression, but not as strongly as violent game exposure, $F(1, 324) = 7.4$, $p < .01$, $b = 0.15$. When violent video game exposure is entered into the model, overall video game exposure becomes a nonsignificant predictor of trait aggression, $F(1, 323) < 1$, $p > .7$, $b = -0.02$. Violent video game exposure is still a significant predictor of trait aggression when overall exposure is in the model, $F(1, 323) = 43.9$, $p < .0001$, $b = 0.37$.

DISCUSSION

The present research demonstrates that reward and punishment for violent actions within video games can affect a player's aggressive behavior towards individuals after game play has ceased. This effect was surprising robust after only twenty minutes of video game exposure. The number of pedestrians that players killed in the video games was shown to mediate the effect of aggressive behavior. The more pedestrians killed, the more aggressive the player would behave in the competitive reaction time task. Variables measured before the experimental session supported the idea that there are long-term consequences of exposure to media violence.

Theoretical Interpretation

These results provide substantial support for our GAM-based interpretation of the effect of violent video game exposure on aggressive behavior. This experiment contributes to our understanding of human aggression from both personality and situational perspectives. These results can best be understood within the GAM theoretical framework.

Situational effects

The main situational finding in this experiment was that brief exposure to violent video games increased aggressive behavior relative to nonviolent video games after controlling for a variety of game characteristics. The lack of reliable sex X game violence interactions suggests this effect was of comparable magnitude in both men and women.

A second, and more specific, situational finding concerns the reward for violence within the violent video games. The main theoretical contribution is that the empirical results support the hypothesis that rewarding an individual for electronic violence can have a significant impact on how aggressive the individual is in other, dissimilar "real life" encounters. Bandura's earlier reward studies demonstrated that children were more likely to imitate a model's specific behaviors when they viewed the model being rewarded for those behaviors (Bandura, 1965; Bandura, Ross, & Ross, 1963). This study takes this finding a step further and demonstrates that rewarding adults (college students) for aggressive play in an electronic game can cause them to behave more aggressively in other situations. This study demonstrates that the effect of reward does not have to be limited to behavior-specific scenarios. The more pedestrians a player killed in the video game, the higher the intensities they issued to a "real life" individual.

The present empirical results in combination with our theoretical analysis also lend support to the concern that repeated exposure to violent video games (or other violent media) might lead to the development of an increasingly aggressive personality, and that much of this developmental effect may be the direct result of the violent content. In short, repeatedly thinking about violent characters, choosing to aggress, enacting that aggressive choice, and being rewarded for it can be conceived as a series of learning trials. Violent video games (especially ones that reward for violent actions) may well teach players to become more aggressive people.

Personality effects

This experiment also provides two contributions to the issue of personality processes. First, trait aggressiveness significantly predicted aggression in the competitive reaction time task. This finding further validates the trait measure and the competitive reaction time task.

A second contribution is the finding that prior exposure to violent video games correlated positively (and significantly) with trait aggressiveness. The correlational findings that violent video game exposure is positively associated with trait aggressiveness, even when sex was statistically controlled, supports an increasingly compelling line of research on media violence exposure (e.g., Bushman & Anderson, 2001). These correlational results provide some support for GAM's long-term predictions of violent media exposure. This finding supports the prediction that repeated exposure to violent video games does create more aggressive individuals. It is also consistent with prior research designed to test such effects (e.g., Anderson & Dill, Study 1, 2000).

Strengths and Limitations

The current study has numerous strengths. One strength of this study is that used the same game was used in every condition, with minor modifications. This aspect of the study enables cleaner inferences to be drawn from the results. All participants played a race car game with the same steering controls. With minimal differences between conditions, the effects on aggression are more clearly attributed to the differences in reward and punishment between game versions.

Another strength is that the type of aggression measure was in a different type of behavior than the actions being rewarded in the video games. This difference enables the results to be more generalizable. Being rewarded for electronic violence in a video game can impact how aggressive an individual is in later interactions with "actual" people. This study demonstrates the effect of reward is not limited to behavior-specific scenarios, something that hasn't been clearly demonstrated in past research.

Despite its strengths and several interesting findings, this study is not without limitations. Even though the same game was used in every condition, there were still differences not relevant to the topic of interest. For example, even though the goal in every version of Carmageddon was to earn as many points as possible, it was easier to accumulate points in some versions than others. The all violence rewarded version contained three different ways to earn points (killing pedestrians, destroying other vehicles, passing race checkpoints) while the all punish version only had one way to earn points (passing race checkpoints). These differences could possibly account for the varying relationship of game action and aggressive behavior in the different game versions. Future research using this video game should try to equate the version even more.

Also, these results could benefit greatly by having more characteristic information about the sample. Only exposure to violent video games was measured. Knowing the sample's exposure to violent television and movies might provide more interesting results. Also, even though trait aggressiveness was measured, other

personality characteristics, such as reactivity to aggression or attitudes towards personal violence, could shed more light on this study's results.

Future Research

A host of important theoretical questions remain for future research. First, it would be useful to understand the relationship between rewarding violent actions in video games and its effect on aggressive cognitions and revenge motivation. For example, does killing pedestrians in a video game for 30 minutes alter a player's attitudes and perceptions of violence towards others?

Studies solely examining reward or punishment might also be useful in understanding the effects of violence in video games. In the present study, violent actions were sometimes both rewarded and punished in the same game (e.g, punished for killing pedestrians but rewarded for destroying vehicles). A useful study may be one that compares the effects of game versions that either: rewards for violent actions, punishes for violent actions, or neither reward nor punish violent actions. This may be a difficult study to conceptualize because even games that do not directly reinforce violent actions through salient rewards (points, entrance to higher levels of the game) may still reward players through aesthetic means (screams of pain, bloody graphics, etc…). Future research should also investigate *who* is most likely to become more influenced by being rewarded in violent video games.

Another question that requires more empirical attention concerns the long-term effects of repeated exposure to violent video games, especially on children and

teens. Based on the violent television and movie research, it is reasonable to predict that repeatedly exposing youth to violent video games over a period of years will have a sizable negative impact on their development. Indeed, there is reason to believe that the video game violence effect will be larger than TV violence effects because of the highly engaging and active nature of video games as compared to the relatively passive nature of watching TV. Nonetheless, longitudinal research is essential to test this prediction.

A third set of questions concerns possible positive effects of games designed to promote prosocial behaviors. This study has demonstrated that aggressive behavior in other situations can be affected by the amount of reward and punishment for violent actions in video games. It is reasonable to ask whether such effects of reward for prosocial behaviors in video games could promote prosocial behavior and decrease antisocial behavior? There is virtually no research examining this topic. Because of the growing nature of the video game industry, it appears that video games are going to remain a major source of entertainment. For this reason, it is important to offer empirical evidence and quality theory on what kinds of features make for a prosocial gaming experience as well as highlighting the potential antisocial effects of games with violent themes.

CONCLUSION

This experiment provides a number of interesting findings. First, this experiment replicates and supports the finding that exposure to a violent video game (even for 20 minutes) causes people to behave more aggressively. Second, this experiment demonstrates that rewards for violent actions within a violent video game can moderate the effect of aggressive behavior. People who played a violent video game that rewarded highly for all violent actions were more aggressive than people who played a game that rewarded violent action less or punished violent actions. This effect of active reward gives some support that exposure to violent video games may be more detrimental than exposure to violent television or movies solely because television cannot actively reward viewers.

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APPENDIX A. ADDITIONAL TABLES

Table 1. *Predetermined outcomes, intensities, and duration on the competitive reaction time task*

Trial Number	Outcome	Intensity	Duration (in seconds)
1	Lose	5	1.25
2	Win	8	0.75
3	Lose	4	2.00
4	Lose	5	0.50
5	Win	9	2.25
6	Win	6	1.75
7	Lose	2	1.25
8	Lose	7	1.50
9	Win	3	1.00
10	Win	4	1.00
11	Win	7	1.50
12	Lose	5	1.25
13	Win	2	0.50
14	Lose	9	2.25
15	Lose	6	2.00
16	Lose	8	0.75
17	Win	3	1.75
18	Win	5	2.25
19	Lose	9	0.50
20	Win	2	1.75
21	Win	4	2.00
22	Lose	8	1.25
23	Win	6	0.75
24	Lose	7	1.50
25	Win	3	1.00

Table 2. *Laboratory aggression as a function of target, sex, and game version.*

Target	Video Game	Sex	N	Aggression	S.D.
Provoker	All Reward	Male	25	214.8	182.0
Provoker	Reward/Punish	Male	24	154.4	140.2
Provoker	All Punish	Male	26	148.8	125.2
Provoker	Nonviolent	Male	26	125.3	85.0
Bystander	All Reward	Male	27	148.6	151.0
Bystander	Reward/Punish	Male	27	206.9	141.5
Bystander	All Punish	Male	25	121.7	92.4
Bystander	Nonviolent	Male	26	160.0	124.1
Provoker	All Reward	Female	29	124.7	119.2
Provoker	Reward/Punish	Female	26	106.1	101.3
Provoker	All Punish	Female	27	121.1	77.2
Provoker	Nonviolent	Female	25	104.9	69.6
Bystander	All Reward	Female	26	101.8	65.6
Bystander	Reward/Punish	Female	27	89.6	62.2
Bystander	All Punish	Female	26	99.8	71.9
Bystander	Nonviolent	Female	23	68.2	51.9

Table 3. *Standardized game action ratings as a function of target, sex, and game version.*

Target	Video Game	Sex	N	Game Action	S.D.
Provoker	All Reward	Male	25	0.22	1.08
Provoker	Reward/Punish	Male	24	-0.05	1.20
Provoker	All Punish	Male	26	0.00	1.15
Provoker	Nonviolent	Male	26	-0.16	1.00
Bystander	All Reward	Male	25	0.18	1.03
Bystander	Reward/Punish	Male	24	0.02	0.94
Bystander	All Punish	Male	26	-0.16	0.94
Bystander	Nonviolent	Male	26	-0.21	0.99
Provoker	All Reward	Female	29	-0.14	1.08
Provoker	Reward/Punish	Female	26	0.00	0.87
Provoker	All Punish	Female	27	-0.10	1.00
Provoker	Nonviolent	Female	25	0.08	0.83
Bystander	All Reward	Female	26	0.03	1.02
Bystander	Reward/Punish	Female	27	0.23	0.94
Bystander	All Punish	Female	26	-0.02	0.87
Bystander	Nonviolent	Female	23	0.10	1.15

Table 4. *Standardized game ease ratings as a function of target, sex, and game version.*

Target	Video Game	Sex	N	Game Ease	S.D.
Provoker	All Reward	Male	25	0.34	1.28
Provoker	Reward/Punish	Male	24	0.49	1.06
Provoker	All Punish	Male	26	-0.34	1.15
Provoker	Nonviolent	Male	26	-0.17	0.96
Bystander	All Reward	Male	27	0.63	0.96
Bystander	Reward/Punish	Male	27	0.10	0.99
Bystander	All Punish	Male	25	0.08	1.14
Bystander	Nonviolent	Male	26	-0.11	0.83
Provoker	All Reward	Female	29	0.01	0.83
Provoker	Reward/Punish	Female	26	0.02	0.91
Provoker	All Punish	Female	27	-0.26	1.02
Provoker	Nonviolent	Female	25	-0.57	0.82
Bystander	All Reward	Female	26	0.25	0.87
Bystander	Reward/Punish	Female	27	-0.08	0.88
Bystander	All Punish	Female	26	-0.32	0.85
Bystander	Nonviolent	Female	23	-0.05	0.87

APPENDIX B. SURVEY MATERIALS

Aggression Questionnaire (Buss & Perry, 1992)

Please rate the items below using the following scale.

1	2	3	4	5	6	7
extremely uncharacteristic of me						extremely characteristic of me

1. Once in a while I can't control the urge to strike another person.
2. Given enough provocation, I may hit another person.
3. If somebody hits me, I hit back.
4. I get into fights a little more than the average person.
5. If I have to resort to violence to protect my rights, I will.
6. There are people who pushed me so far that we came to blows.
7. I can think of no good reason for ever hitting a person.
8. I have threatened people I know.
9. I have become so mad that I have broken things.
10. I tell my friends openly when I disagree with them.
11. I often find myself disagreeing with people.
12. When people annoy me, I may tell them what I think of them
13. I can't help getting into arguments when people disagree with me.
14. My friends say that I'm somewhat argumentative.
15. I flare up quickly but get over it quickly.
16. When frustrated, I let my irritation show.
17. I sometimes feel like a powder keg ready to explode.
18. I am an even-tempered person.
19. Some of my friends think I'm a hothead.
20. Sometimes I fly off the handle for no good reason.
21. I have trouble controlling my temper.
22. I am sometimes eaten up with jealousy.
23. At times I feel I have gotten a raw deal out of life.
24. Other people always see to get the breaks.
25. I wonder why sometimes I feel so bitter about things.
26. I know that "friends" talk about me behind my back
27. I am suspicious of overly friendly strangers.
28. I sometimes feel that people are laughing at me behind my back.
29. When people are especially nice, I wonder what they want.

Violent Video Game Exposure (Anderson & Dill, 2000)

Please think of the five video games that you have played for the greatest amount of time from when you were in 7th grade until the present. Include computer, console/TV, arcade games, and hand held games. Please type the titles of these games on the blank lines below. If you have never played a video game in your life, please leave the questions blank.

1) Title of your "most played" game: _____.

2) Title of your "2nd most played" game: _____.

3) Title of your "3rd most played" game: _____.

4) Title of your "4th most played" game: _____.

5) Title of your "5th most played" game: _____.

Now, please rate each game by answering the questions that follow.

For the following items, rate the game you listed as your "most played" game:

a) In recent months, how often have you played this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

b) During 11th & 12th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

c) During 9th & 10th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

d) During 7th & 8th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

e) How violent is the content of this game?

1	2	3	4	5	6	7
Little or No Violent Content						Extremely Violent Content

f) How bloody/gory are the graphics of this game?

1	2	3	4	5	6	7
Little or No Blood & Gore						Extremely Bloody & Gory

d) Which of the following categories best describes this game? Select all that apply.

A. Education B. Sports C. Fantasy D. Fighting with hands/feet
E. Fighting with Weapons F. Skill

Essay Evaluation Form

After you have thoroughly read the other participant's essay, use the scale below to rate the essay on the following characteristics.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
poor
excellent

1. Organization _____
2. Originality _____
3. Writing Style _____
4. Clarity of Expression _____
5. Persuasiveness of Arguments _____
6. Overall Quality of Essay _____

Other Comments:

Video Game Evaluation

Please answer the following questions about the single player video game you played earlier in this session. To ensure confidentiality, please do **not** put you name or social security number on the sheet.

****

Please rate the video game you played on the following dimensions. Use the following scale:

1	2	3	4	5	6	7	8	9	10
strongly disagree									strongly agree

_____(1.) The game was difficult to play.

_____(2.) The game was absorbing.

_____ (3.) The game was action-packed.

_____ (4.) The game was arousing.

_____ (5.) The game was boring.

_____ (6.) The game was enjoyable.

_____ (7.) The game was entertaining.

_____ (8.) The game was exciting.

_____ (9.) The game was frustrating.

_____ (10.) The game was fun

_____ (11.) The game was involving.

_____ (12.) The game was stimulating.

_____ (13.) The game was violent.

_____ (14.) The game was "addicting."

****

(15.) Have you played this video game before? (circle one) YES NO

Impression Formation Questionnaire

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

_____1. I think that my partner is a competent individual.

_____2. I like my partner.

_____3. I think that my partner is friendly.

_____4. I think my partner is intelligent.

_____5. I think my partner is fair and reasonable.

_____6. I would like to know more about my partner.

_____7. I think my partner is a good person.

_____8. I think my partner will succeed in college.

_____9. I think other people I know, such as my friends, would like my partner.

_____10. If I were to participate in another research experiment that required having a partner, I would be enthusiastic about working with my partner again.

Pro-Life Essay

Some people debate the abortion issue. In my opinion, there is nothing to debate. Abortion is outright murder. If the life was not snuffed out, a person would be born. If a woman is unable, or unwilling to raise a child, there are millions of childless couples waiting to adopt. There is really no logical reason to take an innocent life that has been robbed of its chance to take a first breath. Abortion is not merely getting rid of some tissue. This so-called "tissue" is a person that needs just months to develop into a fully functioning, miraculous being. After only a few weeks of gestation, more human features are present. To suck that baby out, piece by piece, or kill it with acid or whatever horrific method is being used, is a cruel act. It is a crime and should be treated as such.

Pro-Choice Essay

Anti-abortionists are radicals out to make everyone accept their view of "what is right". They don't want anyone to end a pregnancy, but few have been to the inner city to see the results of unwanted children. It would be kinder to terminate a pregnancy than to give birth to an unwanted child that ends up having to suffer his or her entire life. There are women who can't afford to take care of themselves, let alone a baby.

There are many reasons why a pregnancy should be terminated. Being raped is an acceptable reason for having an abortion. Also, discovering that a fetus is deformed would be another good reason. The point is that women should be charge of their own bodies and should be allowed to make their own choice. The government should not be allowed to make their choice.