The Effects of Video Games on Perceptions of Legitimacy for Aggressive Sport Behavior

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Abstract

Recent studies have investigated links between media and violence. Whereas most research has focused on the cumulative (i.e., long term) effects of media on aggression, few have examined the acute (i.e., short term) effects of media on aggression. This study investigated whether interactive video games that reward violence increase perceptions that aggressive sport behavior is acceptable. Male participants were randomly assigned to play one of three video games: a non-contact game (World Championship Poker™), a contact sport game that punishes participants for aggressive acts (Madden 2006™), or a contact sport game that rewards participants for aggressive acts (Blitz: The League™). Hierarchical multiple regression analyses revealed that none of these games led to changes in perceptions of legitimacy.

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A week after the school shootings in Littleton, Colorado, Senator Sam Brownback, presented a speech to his fellow Senate members. In this speech, he discussed the need for U.S. Senate to convene special committee hearings on the effects of video games on children. He stated, "The video game industry has received far less attention than television or movies, but is among the fastest-growing entertainment media (Brownback, 1999)." This call for attention was followed a week later by a hearing in the Senate Committee on Commerce, which examined the marketing of violent video games to children. In recent years, there have been other hearings to examine video games, and their effect on children. One recurring topic is the effects of aggressive video games on children and young adults. The short-term effects of video games have been of particular because of their potential for serious long-term consequences.

The need for special hearings of the United States Senate points to the much larger social problem. Media greatly influences our everyday lives. Ninety-eight percent of homes in the United States own a Television (Nielson Media Research, 1998). The wide-spread availability of television allows everyone in the United States access to some media exposure. The average child is exposed to over 40 hours of media content a week included in that time children and adolescent play video games for almost 7 hours a week (Kaiser Family Foundation, 2005). Americans became concerned about the effects of video games in the late 1990s. The public outcry was in association with a rash of school shooting by avid video game players (Anderson, 2004). Both the public and the government wanted to know how video games influence children's thoughts and behavior.

Psychologists have recently started to examine media in much greater depth. Many competing views have been proposed on the effects of video games on aggression. These studies have focused on both long-term and short-term effects. The study of media exposure on short-term thoughts and behavior is divided into two distinct groups: passive and active exposure (Anderson *et al.*, 2003). *Passive media* constitutes the first type media exposure (e.g., television, film, and music). The person acts as an observer. They have no control in the actions presented on screen. They can only absorb these actions (Felson, 1996). In contrast, with *active media* (e.g., internet and video games), the person not only absorbs the violence, but also actively participates in the acts. The participant has the ability to control acts of aggression and rarely faces consequences for their aggressive actions. In some games, rewards will follow these aggressive acts (Funk, & Buchman, 1996). These rewards entice the participant to commit increasing acts of violence.

The best example of *active media* enticing players to act aggressively is the Grand Theft Auto™ franchise. In the game, the player has the ability to act as violently as they choose. The character is free to explore a fictitious city environment. This city provides the player with the ability to interact with almost thing in it. The person can talk to other characters, driver cars, and explore buildings. There is a dark side to this interaction. The player encounters many other characters, against whom the player can choose to commit random acts of violence. These random killings have no effect on the player's ability to win or lose the game. These acts of violence aid the player's ability to collect money and to buy better weapons (Frasca, 2003).

Video Games and Aggression

Many studies have focused on video games and aggression see Anderson *et al.* (2003) or Kirsch (2003). These studies examine both aggressive thoughts and behaviors. Violent video games have shown to effect subjects' aggressive behavior. After exposure to aggressive video games, participants behaved more aggressively than those participants who played non-aggressive video games (Anderson & Dill 2000; Irwin & Gross, 1995). Participants who were introduced to aggressive games were more likely to show higher levels of approval for aggressive actions (Calvert & Tan, 1994; Uhlmann & Swanson, 2003).

The mechanisms that cause violent video games to increase aggressive behavior are still not completely understood. There are theories, which provide a solid base for research. Social learning theory proposes observational learning of aggressive values and goals (Bandura, 1965; Bandura, Ross, & Ross, 1963). Bandura, Ross, and Ross (1963) found that children who were exposed to adults committing aggressive acts against a doll were more like to commit aggressive acts against the doll. The children were also more likely to mirror the type acts done by the adult. In a follow up study children were shown videos of the adult being punished or rewarded (Bandura, 1965). If the adult was rewarded, the child was more likely to act aggressively toward the doll.

More recent models propose that these mechanisms are not solely observationally learned but maybe automatic and nonconscious. Exposure to violent stimuli may trigger short-term aggressive motives (Bargh & Chartrand, 1999). This exposure does not only include real life interaction. Violent media may also lead to the priming of these aggressive thoughts and goals (Berkowitz, 1990). These aggressive thoughts and goals could lead to aggressive tendencies in certain individuals (Anderson, Benjamin & Bartholow 1998; Todorov & Bargh, 2002; Ferguson, & Bargh, 2003). Recent experimental studies have focused on the priming of automatic aggressive thoughts and behaviors. In the lab setting, participants have shown higher levels of aggressive behavior after being introduced to an aggressive video game than those who played non-aggressive games. This aggressive behavior maybe attributed to short-term priming effects from the games (Anderson, & Dill, 2000; Carnagey & Anderson 2005).

The present study has two primary purposes. First, the effect of exposure to aggressive-sport video games on perceptions of legitimacy of aggressive sport acts was examined. Participants who were exposed to the aggressive video game were expected to increase their perceptions of legitimacy for the aggressive actions. Second, different effects from games that rewards vs. punishment of aggressive acts were tested Participants punished for aggressive actions were not expected to show no significant change in their perceptions of legitimacy whereas participants rewarded for their aggressive actions were expected to increase their perceptions of legitimacy for the aggressive actions.

Methods

Participants

Participants were male college students ($N = 50$) from a large eastern university. Participants were randomly assigned to one of three conditions in which they played a video game that featured either: no opportunities for aggression (Poker; $n = 16$), was punished for aggressive behavior (Madden; $n = 17$), or rewarded for aggressive behavior (Blitz; $n = 17$). Participants ranged from 18 to 24 years ($M = 20.48$ $SD = 2.04$). White/Caucasians comprised 66% of the sample. African American/Blacks comprised 14% of the sample. Asian-Americans comprised 8% of the sample. Hispanics comprised 4% of the sample. Other responses included other (6%), and missing data (2%). Participants included seniors (48%), freshman (32%), juniors (10%), sophomores (6%), and graduate students (4%).

Instruments

Participants completed a pre-game questionnaire which included demographic questions, the Aggression Questionnaire (Buss & Perry, 1992) and three scenarios from the Sports Behavior Inventory (SBI; Conroy *et al.,* 2001). A post-game questionnaire was also completed which included three additional scenarios from the Sports Behavior Inventory. The Aggression Questionnaire is a 29-item questionnaire. It has four scales: verbal aggression, physical aggression, anger, and hostility. All of these scales have proved to have acceptable psychometric properties. The participants responded on a five-point likert type scale ranging from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). Due to an administrative oversight item 16 from the Aggression Questionnaire was not included.

The SBI provides a measure of perceptions of legitimacy of aggressive sport behavior. Both the pre-game and post-game questionnaire included one scenario from a basketball, football, and soccer situation. These scenarios portray aggressive, rule-violating behavior. The participants could respond on an eight-point scale ranging from 1 (*Never OK*) to 8 (*Always OK*). Conroy *et al.* (2001) found that the SBI may provide a sound structural validity in measuring participants' perceptions of legitimacy of aggressive sport behavior. Conroy *et al.* also found perceived legitimacy scores as measured by the SBI were related to physical aggression scores as measured by the Aggression Questionnaire. See Table 1 for internal consistency of the SBI and physical aggression scale.

Procedures

Each participant completed a pre-game questionnaire. Participants were randomly-assigned to a video game condition and provided with a brief introduction to the game the participant before play began. Participants times were recorded by the researcher: World Championship Poker™ (M = 25.00 SD = 0.00), Madden 2006™ (M = 24.12 SD = 2.45), Blitz: The League ™ (M = 22.48 SD = 2.15). After playing the game, participants completed the post-game questionnaire. Upon completion of questionnaires, the researcher conducted a debriefing to gauge the participant's awareness of the purpose of the study. Participants received a gift certificate for one ice cream cone upon completion of the study.

Equipment

The console used in this experiment was a Sony Playstation II game system. Participants were exposed to one of three possible conditions. Blitz: The League ™ is a video game, which allows the participant to commit aggressive acts. The game does not enforce penalties and the participant does not experience an adverse consequence for committing an unsportsmanlike act. This game passively rewards the participants for committing unsportsmanlike conduct. Participants were asked to watch a quick instructional video on how to use the "dirty hit" control. The dirty hit button allows the participant to damage the health or injure the opposing team's players. The participant will also receive "clash icon" for each dirty hit. Once a certain amount are obtained the player becomes almost invincible, and the likelihood of inflicting an injury to their opponent rises dramatically. They then played an entire game of four two-minute quarters.

Madden 2006™ is a football game that simulates the National Football League. The game enforces penalties and these penalties create consequences for unsportsmanlike actions (i.e., breaking rules hinders the participant chances of winning). The participant watched a short video on a new passing feature in Madden 2006™ and then played two five-minute quarters.

World Championship Poker™ simulates tournament style Texas Hold'em. Participants did not watch an introductory video. Participants participated in the tournament for twenty-five minutes.

Results

Descriptive Statistics

Table one presents descriptive statistics for SBI and Aggression Questionnaire scores. Participants reported having little experience with World Championship Poker™ (M = 0.40 months, SD = 2.01) and only slightly more experience with other poker games (M = 0.68 months, SD = 2.07). Participants reported having played Madden 2006™ an average of 3 months (SD = 4.34). Participants reported having played Blitz: the League™ considerably less then Madden 2006™ (M = 0.44 months, SD =1.86). Other football games were played in varying amounts (M = 26.77 months, SD = 50.24). Participants reported having played video games in a drastically varying amounts (M = 84.96 months, SD = 74.58). Collision sports included lacrosse, ice hockey, and football (M = 4.27 season, SD = 5.06). Contact sports included basketball and soccer (M = 6.56 seasons, SD = 7.78). Non-contact sports included tennis, volleyball, golf, track, and bowling (M = 4.38 seasons, SD = 4.18).

The pre-game SBI scores were parceled and averaged for each of the three scenarios (Conroy *et al*., 2001). The internal consistency of each of the SBI responses was then determined. Responses to the pre-game and post-game questionnaires had high internal consistency (α = .94 and .93) respectively. The internal consistency coefficient (Cronbach alpha) for physical aggression was .76.

Data Analysis

A hierarchical multiple regression tested whether changes in SBI scores could be predicted by either (a) football vs. poker, or (b) engagement in a football game that rewards vs. punishes aggression. Pre-game SBI scores were entered into the first step of the regression to predict post-game SBI scores; experimental condition contrasts were then entered in a second step. Results indicated that Perceived Legitimacy (pre-game) significantly predicted post-game scores (β = .3.47 p < .01); however, none of the planned contrasts between video game conditions were statically significant predictions (p > .05).

In a post-hoc of analyses collision (β = -.04), non-contact (β = -.60), and non-contact (β = -.18) sport experience failed to predict changes in SBI scores. Prior video games experience also failed to predict changes in SBI scores: Poker Video Games (β= -.00), Madden 2006™ (β= .05), Blitz (β = .03), and all video game experience (β= -.11). Physical aggression cores marginally predicted post-game scores (β= -.15 p = .05).

Discussion

This study examined the effect of video games on perceptions of legitimacy of aggressive sport behavior Although it was hypothesized that participants' perceptions of legitimacy would change as a result of playing one of three video games that varied with respect to aggressiveness, results did not indicate any significant change due to experimental condition. After playing the video games, participants who played the collision sport related games (Blitz: The League™ & Madden 2006™) did not report higher levels of perceived legitimacy than those who played a control video game (World Championship Poker™). It was also hypothesized that participants that played a collision sport game that rewarded aggressive acts (Blitz: The League™) would report higher levels of perceived legitimacy than those who played a sport game that punished aggressive acts (Madden 2006™). Results did not indicate a significant difference between those that played Blitz: The League™ and those that played Madden 2006™.

There were two statistically significant predictors of post-game SBI scores. Pre-game SBI scores predicted post-game SBI scores. This findings indicated that SBI scores were reliable and resistant somewhat to change. Physical aggression scores demonstrated a marginal significance in determining post-game SBI scores. Post-hoc analyses of sport and video game experience did not find any indication of a significant relationship to post-game SBI scores. Participants' sport experience did not predict post-game perceptions of legitimacy. These results differed from previous findings; Conroy *et al.* (2001) found that participants with contact sport experience indicated higher levels of perceived of legitimacy. Results indicated that previous video game experience did not effect perceptions of legitimacy. In other studies, video game experience has exhibited an effect on participants' aggressive cognitions (Anderson & Dill, 2000; Uhlmann & Swanson, 2003).

These results are an anomaly in light of findings from previous research. (Anderson, 2004). Previous research has suggested that there is a relationship between aggressive cognitions and exposure to aggressive video games (Calvert & Tan, 1994; Uhlmann & Swanson, 2003; Anderson, & Dill, 2000; Carnagey & Anderson 2005). For a more complete review of video games and aggression readers are referred to either Anderson *et al.* (2003) or Kirsch (2003).

One reasons for the lack of support for the hypothesis might have stemmed from statistical power limitations of the study that were a result of a limited sample size. Due to time constraints, only 50 participants completed the study. This sample size does not provide adequate power to detect medium-sized effects at the conventional $p = .05$. Only large effects ($d = .80$) would be detectable (Cohen, 1988). The effect size of this study was .22; with n = 50 and a conventional $p = .05$, the power of this study would be .29. The effect size points towards this studying being underpowered. In order to obtain adequate power, a minimum of 78 participants would be needed to find a large effect size (.80).

This study is one of a limited number of studies that examine the effects of video games on aggression. More research on video games effect on perceptions of legitimacy of aggressive behavior is needed. Future studies should examine reward vs. punishment of aggressive acts. To date, only this study and Carnegy and Anderson (2005) have examined reward vs. punishment in video games. Almost all violent video games either directly or indirectly reward aggressive acts. In Blitz: The League™, players receive many direct rewards for these aggressive acts (e.g., clash icons, verbal praise, and possession of the football).

The reward of useful items, verbal praise, and advancement of levels are also common direct rewards found in video games. These direct rewards actively promote the aggressive act. Indirect rewards include intriguing visuals and sound effects. They might not actively promote the action, but they happen simultaneously or immediately after the action. Indirect rewards may also encourage players to act more aggressively. The future research should examine the effects of both direct and indirect rewards on participants' aggressive thoughts and behavior. Even though this study was unable to find significant results; the need for video game research is still pertinent to issues effecting children and adolescents.

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Table 1
Descriptive Statistics for Aggression Questionnaire, pre-game, and post-game SBI

Scale	N	*M*	*SD*	α
Aggression Questionnaire				
Physical Aggression	50	2.50	0.76	.76
Hostility	50	2.86	0.76	.74
Verbal Aggression	50	3.18	1.10	.66
Anger	50	2.25	0.58	.60
SBI Scores				
Perceived Legitimacy (pre-game)	50	2.60	1.22	.94
Perceived Legitimacy (post-game)	50	1.97	1.22	.93

Table 2
Summary of hierarchical Regression analysis for Variables Predicating Post-Game levels of Perceived Legitimacy

Variable	B	SE B	β
Step 1			
Pre-Game SBI	3.47	.59	.00**
Step 2			
Physical Aggression	-.14	.14	.07*
Rewards Aggression or No Reward	-.27	.21	.21

** $p < .01$
* $p < .05$