



The Effects of Watching Violent Video Games on physical fights, arguments with teachers, Irritability, and School Performance among High School Students in Kuwait: An Experimental and Survey Designs

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Abstract:

Video games have become one of the favorite activities of Kuwaiti youth in the present time. The goal of this study was to examine the associations among violent video game exposure, irritability, arguments with teachers, school grades, and physical fights. Four hundred eighty seven cases of both males and females were selected randomly from different high schools in Kuwait. Multiple and logistic linear regressions indicated adolescents who expose themselves to greater amounts of video game violence were more irritable, reported getting into arguments with teachers, and they were more likely to be involved in physical fights, and performed more poorly in academic performance namely grades. Results are interpreted within and support the framework of the General Aggression Model.

Introduction

Worldwide video game sales are now at \$20 billion (Cohen, 2000), fueled in part by the more than 100 million Game boys and 75 million PlayStations that have been sold around the world. The popularity of home video and computer games has increased over the last two decades. Sales figures outline this increase. In 1982, arcades with videogames reported sales of eight billion dollars (*Videogames-Fun or*

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serious threat?) and 1.7 billion dollars were spent on home videogames (Alperowicz, 1983). In 1985, annual video game sales were \$100 million and by 1990 that figure had risen to four billion dollars (Provenzo, 1991).

Sony Computer Entertainment Europe, based in London, is responsible for the distribution, marketing and sales of Play Station in 102 territories across Europe, the Middle East, and Africa. By the end of June 2003, over 39 million Play Station machines had been shipped across these territories. In the Middle East, computer games Sony and Play Station will raise up to 600.000 units by the end of 2003. It will grow rapidly in Saudi Arabia, United Arab Emirates, and Kuwait, which lead the regional markets in video games sales. For example, Kuwait has imported video games from different countries such as Jordan, Saudi Arabia, China, Japan, and United Kingdom with an approximate amount of 1,014,453 Kuwaiti Dinars in 2002 (Ministry of Planning, 2002). Not only has the popularity of video games increased over the last 20 to 30 years, the content of video games has become increasingly violent, and concern over the effects of playing videogames has increased as well. For example, the 1970's Atari game "Pong" was simply a videogame version of ping-pong, and the Violent Video game 1980's favorite "Pac-Man" depicted a round yellow character "eating" pellets and ghosts and trying to avoid being eaten by said ghosts. Using today's standards, "Pac-Man," and other early videogames like "Space Invaders," "Defender," and "Asteroids" appear relatively non-threatening; however, in the early 1980's these games were characterized as violent and concerns arose about the anti-social effects of playing these games (Dominick, 1984). By the 1990's, movie-type images and virtual reality technology made video and computer games even more realistic, and the games became more violent than those developed during the 1980' (Anderson & Dill, 2000; Funk & Buchman, 1996). For example, scholars noted that video games required players to engage in antisocial behaviors, with no options to compromise, in order to win (Funk & Buchman, 1996;

Provenzo, 1991). Furthermore, the games featured no realistic consequences for the violent behavior and the impact of the violent behavior portrayed in the games was unseen (Funk & Buchman, 1996). It is precisely this violent contact that seems to attract players to these games, as research indicates that half of young teens' favorite videogames were ones that had violent themes (Funk, 1993). Young peoples' encountering and processing violent videogame content might be expected to facilitate aggressiveness by evoking thoughts related to violence in the communicator's mind, thus making these thoughts and related mental constructs more accessible to the communicator. These constructs can passively and involuntarily influence the communication and beliefs of individuals (Berkowitz, 1984; Jo & Berkowitz, 1994). The means by which violent video games may influence aggressiveness can be explained within the cognitive association perspective (Anderson & Bower, 1973; Landman & Manis, 1983) and related work on priming (Berkowitz, 1984; Jo & Berkowitz, 1994) and mental construct accessibility (Bruner, 1957; Bushman, 1998; Higgins & King, 1981; Jo & Berkowitz, 1994; Wyer & Srull, 1981). These perspectives provide a theoretical foundation for understanding and investigating the effects of playing violent videogames on individuals' aggressiveness and hostility.

Effects of violent video game content on aggression

Recent content analyses of video games show that as many as 89% of games contain some violent content (Children Now, 2001), and that about half of the games include serious violent content towards other game characters (Dietz, 1998; Children Now, 2001; Dill, Gentile, Richter, & Dill, 2001). Therefore, among the games being purchased and played by youth, a majority contain violence. The popularity of video game violence has spurred much research on the possible harmful effects on children and adolescents. A meta-analysis by Anderson and Bushman (2001) found that across 54 independent tests of the relation between video game violence and aggressions, involving 4262 participants, there appear to be five consistent results of playing

games with violent content. Playing violent games increases aggressive behaviors, increases aggressive cognitions, increases aggressive emotions, increases physiological arousal, and decreases prosocial behaviors. These effects are robust; they have been found in children and adults, in males and females, and in experimental and non experimental studies. This is not to say that no studies have failed to find evidence of an effect. However, the majority of studies have found such evidence. Possible moderators of the effects of video game violence. Some of the existing research may be difficult to interpret because most studies of violent video games do not measure individual differences that may moderate the effects. Indeed there have been some intriguing research findings demonstrating individual differences in response to the effects of violent video games. For example, a few recent studies have shown that trait hostility may moderate the effects of playing violent video games (Lynch, 1994; Lynch, 1999; Anderson & Dill, 2000). Additionally, a correlation study by Anderson and Dill (2000) found that associations between violent video game play and aggressive behavior and delinquency were stronger for those who were characteristically aggressive. This interaction of violent content with trait hostility is important because it suggests that the harmful effects of playing violent games may be even greater for children who are already at higher risk for aggressive behavior.

A theoretical model for the effects of violent video game content

Anderson and colleagues (Anderson & Dill, 2000; Anderson & Bushman, 2002) have developed the General Aggression Model (GAM) to explain theoretical links between violent video game exposure and aggressive cognitions, attitudes, and behaviors. This model describes a "multi-stage process by which the person logical (e.g. aggressive personality) and situational (e.g. video game play and provocation) input variables lead to aggressive behavior by influencing several related internal states and the outcomes of automatic and controlled appraisal (or decision) processes"(Anderson & Dill, 2000, p. 773).

Physical Fights and Argument between Teachers and Students

Studies measuring aggressive behaviors after playing violent video games (compared with behaviors displayed after playing non-violent games) have shown that violent games increase aggression. In one study of college students, students played either a violent or non-violent game. After playing this game, they were given a competitive reaction time task in which they played against another student. If they beat the other student, they got to deliver a loud "noise blast," and were able to control how loud and how long the noise blast would be. Students who had previously played the violent video game delivered longer noise blasts to their opponents (Anderson & Dill, 2000). In a study of 8th and 9th graders, students who played more violent video games were also more likely to see the world as a hostile place, to get into frequent arguments with teachers, and to be involved in physical fights (Gentile et al., 2002). It has often been suggested that violent video games are not the culprit for these types of behaviors; instead, the cause is underlying hostility. The argument goes, "Hostile kids get into more arguments and more fights. They also like to play more violent games." While this is true, it is not the whole story. This study measured children's trait hostility, and found that exposure to video game violence is a significant predictor of physical fights, even when students' sex, hostility level, and amount of video game playing are controlled statistically. If hostility were the whole story, then in general, only hostile children would tend to get into fights, and children with the lowest hostility scores would not get into physical fights regardless of their video game habits. Table 1 shows the percentages of students who report being involved in physical fights within the previous year. Children with the lowest hostility scores are almost 10 times more likely to have been involved in physical fights if they play a lot of violent video games than if they do not play violent games (38% compared to 4%). In fact, the *least* hostile children who play a lot of violent video games are more likely to be involved in fights than are the *most* hostile children who do not play violent video games.

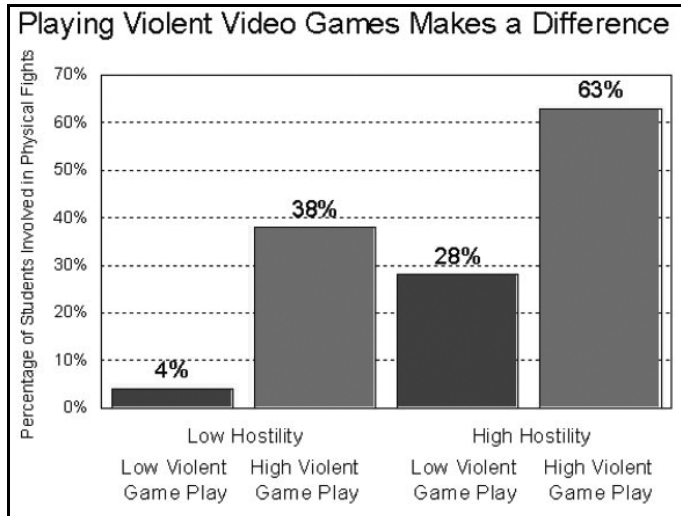


Figure. 1

Irritability

Summarizing GAM's predictions for the effects of violent video games on irritability, Anderson and Dill drew the following conclusions. "Short-term violent video game increases in aggression are expected by [the model] whenever exposure to violent media primes aggressive thoughts, increases hostile feeling or increases arousal" (Anderson & Dill, 2000, p. 774). This suggests that in the short term, irritable hostility may be a moderator of the effects of violent content, because aggressive thoughts and feelings may be more easily accessible for more hostile individuals. With respect to long-term exposure to violent content, GAM suggests that this may result in the development, over-learning, and reinforcement of aggression-related knowledge structures. These knowledge structures include vigilance for enemies (i.e. hostile attribution bias), aggressive action against others, expectations that others will behave aggressively, positive attitudes towards use of violence, and the belief that violent solutions are effective and appropriate.

Effects of amount of video game play on Academic achievement

Studies have shown a negative association between amount of video game play and academic achievement for children, adolescents, and college students (e.g. Harris & Williams 1985; Creasey & Myers, 1986; Lieberman, Chaffee, & Roberts, 1988; Van Schie & Wiegman, 1997; Roberts, Foehr, Rideout, & Brodie, 1999; Anderson & Dill, 2000; Walsh, 2000). High-school students who report spending more time playing video games or who report spending more money on video games had poorer grades in English classes (Harris & Williams, 1985; Anderson & Dill, 2000; Paschke, Green, & Gentile, 2001). The content of the games being played certainly could affect the relationship between amount of play and academic achievement. If, for example, students played only educational games, they would probably be less likely to show a corresponding deficit in school performance. Lieberman et al. (1988) have shown that children who use computers to play games frequently perform more poorly in school, whereas those who use computers for schoolwork perform better in school.

Hypotheses

The current research tested hypotheses regarding video game content derived from GAM:

(1) exposure to violent video games is positively correlated with aggression in naturalistic settings, namely arguments with teachers, physical fights and irritability.

(2) amount of video game play is negatively related to academic performance, namely grades.

Method

Sample

The population of this study was students in high schools in Alassima governorate. The total numbers of high school students in

Alassima governorate was (14335). This number composed into male (7523), and female (6812), which are located in twenty five high schools in Alassima governorate. The sample of this study was high school students of four hundred eighty seven cases of 9th-grade and 10th-grade. The sample was divided into two groups such as male (n = 261), who were selected from thirteen high schools, and female (n = 226), who were selected from twelve high schools in Alassima governorate. The random selection is carried in such a way that every element in the population has an equal chance of being included in the sample. To select one school in Alassima governorate, the researcher first wrote the names of schools on pieces of papers, and then a random selection for a school was chosen from Alassima governorate in order to have an equal chance for these schools to be included in the sample. Eighty five percent of the respondents' classified themselves as Kuwaiti, which represented the Alassima governorate area. The mean age of respondents was 15 years (s.d. = 1.50). Participants were treated in accordance with the 'Ethical Principles of Psychologists and Code of Conduct' (American Psychological Association, 1992).

Procedure

Data was collected between September 8, 2002 and June 13, 2003 on site in each of these schools through administering a survey that had been translated from English to Arabic, the native language of Kuwait, and from Arabic to English (back translation) to be sure that the items translation was completed with the assistance of a professor in the English Department at Kuwait University. Also, parents of students in participating classrooms were informed about the study to request consent. Consent levels were greater than 90% for all classrooms. Interested teachers volunteered their classrooms for inclusion in the study. Each of the participating classrooms was a mandatory class (i.e. not elective) to reduce the likelihood of self-selection bias. Each participant completed an anonymous survey that gathered descriptive data about students, knowledge about video

games, as well as school performance, demographic data, and a measure of aggression scale. The survey was protsted with 143 7th through 12th-grade students (Walsh, 2000). The classroom teachers were trained to administer the surveys, which were administered during one class period. The experimental design is a research for investigating cause and effect under highly conditions. Successful experiments depend on carefully controlling all factors that might affect what is being measured. Control is easiest in laboratory, but experiments in everyday location in the field which is the classrooms or in the field have the advantage of letting researcher observe subjects in their natural settings. For example, the students were instructed that video games included any games played on computer, video game consoles (such as Nintendo), on hand-held game devices (such as Game boy), or in video arcades and inside classrooms environment for the boys and girls.

Reliability and Validity

In order to asses the reliability and validity of this study in local area, the coefficient alpha was high after the pilot study indicating high internal consistency and stability for all the scales in the present study, and validity which measures the operational definition and the concept is being measured interpreted within and support the framework of the General Aggression Model. Caprara (1982) found that irritability predicted aggressive behavior in provoked individuals. Caprara reported a coefficient alpha for the irritability scale at.81 and a test-retest reliability of.83 (Caprara et al., 1985). For the present study, the current study reports a Chronbach's alpha of.853 for all items. High-school students who report spending more time playing video games or who report spending more money on video games had poorer grades in English classes (Harris & Wiliams, 1985; Anderson & Dill, 2000; Paschke, Green, & Gentile, 2001). The alpha score for the current study is.894.

Variables

Violent video game exposure. Similar to Anderson & Dill's (2000) approach, participants were asked to name their three favorite video games. For each named game, participants were asked to rate how frequently they played the game on a 7-point Likert scale (1 = "rarely", 7 = "often"). Participants were also asked to rate how violent each game is on a 7-point Likert scale (1 = "little or no violence", 7 = "extremely violent"). A video game violence exposure score was computed for each participant by multiplying the frequency of play for each game by its violence, and taking the mean of the three products. Cronbach's alpha for this three-item scale was 0.43, which is lower than the 0.86 alpha Anderson and Dill (2000) obtained. However, Anderson and Dill used five items rather than three, and we would predict reliability to drop somewhat with fewer items. Participants were also asked to indicate how much violence they prefer to have in their video games on a 10-point scale (1 = "no violence", 10 = "extreme violence"), and how much violence they prefer to have in their video games compared to 2-3 years ago on a 5-point scale (1 = "a lot less", 5 = "a lot more"). The alpha score for this scale in the study is .821

Amount of video game play. Participants were asked about the amount of time they spent playing games during different time periods on weekdays and weekends. The weekly amount of game playing was calculated from these responses. It is unclear whether we should even expect the video game violence exposure scale to have high reliability. Calculating violence exposure from favorite games appears to be an empirically appropriate approach. However, it is entirely likely that some players would like both violent and non-violent games, which would make the scale appear unreliable, when in fact the scale is measuring exactly what it is intended to measure—that some people play only violent games, some play only non-violent games and some play a mix of violent and non-violent games.). The alpha score for this scale in the study is .894.

Irritability

The Caprara Irritability Scale (CIS) measures aggressive impulsivity or proclivity toward quick and impulsive reactions to what the individual perceives as provocation or frustration (Caprara et al., 1985). Agreement with statements such as, "I easily fly off the handle with those who don't listen or understand" and "I don't think I am a very tolerant person," indicates irritability. Caprara (1982) found that irritability predicted aggressive behavior in provoked individuals. Caprara reported a coefficient alpha for the irritability scale at .81 and a test-retest reliability of .83 (Caprara et al., 1985). The CIS contains 20 standard Likert-type items that Caprara et al., (1985) labeled "irritability" items and 10 additional control items that might be thought of as "friendliness" items. Based on past research in which they were found to be a viable predictor of irritability (e.g., Dill et al., 1997), the 10 "control" items were included in the measure. Thus, the irritability composites reported are an average of 30 items, the 20 irritability items and the 10 "friendliness" items (reverse scored). The current study reports a Chronbach's alpha of .853 items.

Arguments with teachers. Participants were asked how often they had gotten in arguments with their teachers in the past year. Responses were rated on a 4-point Likert scale (ranging from "Almost daily" to "Less than monthly"). Responses were coded such that higher scores indicate higher incidence of arguments with teachers. The current study reports a Chronbach's alpha of .931 items.

Grades. Participants were asked to report their average school grade, ranging from A+ through F. Answers were coded such that higher scores indicate higher grades in school. The alpha score for this scale in the study is .861

Physical fights. Participants were asked if they had been in a physical fight in the last year. This question yielded a dichotomous response (yes/no). The alpha score for this scale is .894

Data Analysis

Data were coded for computer analysis. The Statistical Package for Social Science Program (SPSS) was used for the statistical analysis.

Results

Descriptive statistics

Table. 1

Variables	Total Sample Males and Females (N = 487)	Male Group (N = 261)	Female Group (N = 226)	Remarks M = mean SD = standard de- viation
<i>Amount of video game play</i>	M-----SD 8.0-----10.9	M-----SD 14.2*---12.3	M-----SD 4.8*-----7.9	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Violent video game exposure	24.5-----12.2	5.6*-----3.3	2.8*-----2.1	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Irritability	6.67-----2.26	12.5*---4.17	11.7*---3.33	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Arguments with teachers	8.41-----1.32	12.1*---1.08	5.8*-----1.81	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Grades	3.40-----1.98	2.05*---1.05	2.8*-----1.10	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Physical fights	9.83-----37	15.8*---6.50	3.46*---1.47	<i>Note: *means signif- icant different from each other at p < 0.001</i>
Age	15.8-----1.50	15.6*---.951	13.7*---.321	<i>Note: *means signif- icant different from each other at p < 0.001</i>

Males spent significantly more time playing video games each week than females (13 and 6 h per week, respectively; $t(475) = 17$; $p < 0.001$). Video game play was widespread in this sample; only 5% said they never play video games, and 58% reported playing at least once a week. When asked to rate how much violence they like to have in video games on a scale from 1 to 10 (1=no violence, 10=extreme violence). There were significant sex differences on this variable, with boys ($M=5.6$; $s.d. = 3.3$) preferring higher levels of violence than girls ($M=2.8$; $s.d. = 2.1$), $t(451)$ ($p < 0.001$). Two-thirds (66%) of boys chose the scale point six or higher, whereas only 24% of girls preferred this much violence in their video games. Overall, when asked to rate the amount of violence in their three favorite games, 63% of the games named were rated as having some violence on a 7-point scale, and 38% were rated as including violence at or above the midpoint of the scale. Boys were less likely to name games with no violence as their favorite games (29% of the favorite games named by boys include no violence, compared to 49% of the favorite games named by girls). Boys were also more likely to name games that they rated as having high violence (rated at or above the scale midpoint) as their favorite games. Almost half (50%) of the favorite games named by boys had high violent content, compared to 19% of the favorite games named by girls. Overall, 25% of children reported getting into arguments with their teachers "almost weekly" or "almost daily", and 36% reported getting into a physical fight within the past year. Again, there were sex differences. Boys were more likely to be aggressive, with 29% saying they get into arguments with teachers "almost weekly" or "almost daily", whereas only 18% of girls get into arguments with teachers that frequently ($X^2(3, N = 425) = 7.68, p < 0.05$). Forty eight percent of boys reported getting into fights in the past year, whereas only 18% of girls reported getting into physical fights ($X^2(2, N=478) = 61.04, p < 0.001$). Girls also reported slightly higher average grades than boys (mean grade equivalents = B+ and B, respectively $t(397) = 5.32; p < 0.05$).

Table. 2
Correlations

		A	B	C	D	E	F	G	H
A) PHYSICAL FIGHT	Pearson Correlation	1.000	-.046	-.083	-.049	-.140*	-.031	.006	.081
	Sig. (2-tailed)	.	.309	.066	.280	.002	.489	.898	.047
	N	487	487	487	487	486	487	487	487
B) Argument with teacher	Pearson Correlation	-.046	1.000	.377*	-.232*	.553*	-.106*	.143*	.066
	Sig. (2-tailed)	.309	.	.000	.000	.000	.019	.002	.145
	N	487	487	487	487	486	487	487	487
C) Time of Play	Pearson Correlation	-.083	.377*	1.000	-.294*	.582*	-.041	.073	.023
	Sig. (2-tailed)	.066	.000	.	.000	.000	.367	.108	.611
	N	487	487	487	487	486	487	487	487
D) Irritability	Pearson Correlation	-.049	-.232*	-.294*	1.000	-.444*	.013	-.049	-.042
	Sig. (2-tailed)	.280	.000	.000	.	.000	.769	.285	.355
	N	487	487	487	487	486	487	487	487
E) violent video exposure	Pearson Correlation	-.140*	.553*	.582*	-.443*	1.000	-.116*	.149*	.015
	Sig. (2-tailed)	.002	.000	.000	.000	.	.010	.001	.746
	N	487	487	487	487	486	487	487	487
F) Gender	Pearson Correlation	-.031	-.106*	-.041	.031	-.116*	1.000	-.080	.014
	Sig. (2-tailed)	.489	.019	.367	.769	.010	.	.076	.750
	N	487	487	487	487	486	487	487	487
G) grade	Pearson Correlation	.006	.143*	.073	-.049	.149*	-.080	1.000	-.034
	Sig. (2-tailed)	.898	.002	.108	.285	.001	.076	.	.457
	N	487	487	487	487	486	487	487	487
H) AGE	Pearson Correlation	.081	.066	.023	-.042	.015	.014	-.034	1.000
	Sig. (2-tailed)	.074	.145	.611	.355	.746	.750	.457	.
	N	487	487	487	487	486	487	487	487

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

1 = Male, 2 = Female

Zero-Order Correlations

Table three presents the zero-order correlations for all the variables. Table.2 reveals that physical fight was positively related with the violent video exposure ($r_s = .53$). Also, argument with teachers, time of play, and irritability were positively related with the violent video exposure ($r_s = .55, .58, \text{ and } .44$, respectively). In addition, correlations involving gender of participant revealed that gender was strongly related to the number of variables such as the violent video exposure ($r = .43$), physical fight ($r = .32$), time of play ($r = .31$), and argument with teachers ($r = .21$). Another interesting finding to emerge from data shown in Table three violent video exposure and time of play were negatively and significantly related to grade ($r = -.36$ and $-.34$, respectively). Finally, time spent playing video games in general was strongly also positively related to the violent video exposure ($r = .58$), argument with teachers ($r = .37$), and irritability ($r = .29$).

Logistic Linear Regression Analysis:

A physical fight is a dichotomous variable (yes/no). To test this variable, we conducted logistic regressions predicting physical fights in the past year (dichotomous variable). To provide a stricter test of whether VGE contributes independently to physical fights, we conducted a logistic regression in which we entered gender, irritability, and amount of video game play per week as shown on Table 4. The expected log odds of supporting the physical fights for males are .2447 higher than females after controlling the effects of irritability, time of play, age and grade. The odds coefficient EX (B) = 9.7825 indicates that males are more likely to be involved in physical fights than females. Also, irritability EX (B) = 6.9086 and time of play EX (B) = .8066 has a positive effect on the expected log odds of physical fights. In addition, for every standard deviation increase in the level of age, the expected odds of physical fight increases by 1.587 standard deviation. As a result, age has a positive effect on the expected log odds of physical fight.

Table. 3
Logistic Linear Regression Analysis:

Variable	B	S. E.	Wald	Df	Sig	R ²	Exp(B)
*Gender	.2447	.3292	.5525	1	.0457	0.21	9.7825
Irritability	.1985	.0568	2.8509	1	.0091	0.23	6.9086
Time of Play	.2363	.0948	5.1426	1	.0233	0.26	.8066
Age	.1473	.0818	3.2410	1	.0071	.0532	1.587
Grade	.1154	.0629	1.0602	1	.0083	.0461	1.015

*1 = Male, 2 = Female

Hierarchical multiple regression predicting arguments with teachers

As shown on Table. 5, the observed data are consistent ($t = 9.793$, $p = .000$) with the research hypothesis that the standardized regression coefficient, $B = .498$, indicates the positive linear effect of violent video exposure on argument with teacher. The R^2 for the violent video exposure explains approximately 12.2 % of the variance in argument with teachers. Also, the standardized regression coefficient, $B = .025$, indicates the positive linear effect of physical fight on argument with teacher. Physical fight explains approximately 10.1% of the variance in argument with teachers. The observed data is consistent ($t = .467$, $p = .000$) with the research hypothesis that the standardized regression coefficient, $B = .02$, indicates the positive linear effect of irritability on argument with teacher. The R^2 for the irritability explains approximately 7.2 % of the variance in argument with teachers. As a result, the data is consistent with the research hypothesis (1) exposure to violent video games is positively correlated with aggression in naturalistic settings, namely arguments with teachers, physical fights and irritability.

Table. 4
Hierarchical multiple regression
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig.
		B	Std. Errpr	Beta		
1	(Constant)	.218	.664		.329	.007
	PHYSICAL FIGHT	.746	.137	.025	.638	.052
	Time of Play	.536	.046	.089	1.925	.055
	Irritability	.212	.025	.020	.467	.000
	violent video exposure	.143	.005	.498	9.793	.000
	Gender	.549	.142	.039	1.025	.031
	grade	.541	.026	.063	1.639	.010
	AGE	.345	.033	.055	1.447	.015

^a Dependent Variable: Argument with teacher

* Gender 1 = Male, 2 = Female

Hierarchical multiple regression predicting grades

As shown on Table. 6, the observed data are consistent ($t = -.441$, $p = .007$) with the research hypothesis that the standardized regression coefficient, $B = -.025$, indicates the negative linear effect of the amount time of playing on grade. The R^2 for the time of the playing explains approximately 15.3 % of the variance in grade. The unstandardized regression coefficient indicates for each unit increases in time of play, the expected value of grade decreases by $-.367$ units. As a result, the data are consistent with the research hypothesis (2) amount of video game play is negatively related to academic performance, namely grades.

Table. 5
Hierarchical multiple regression
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig.
		B	Std/ Errpr	Beta		
1	(Constant)	3.605	1.175		3.068	.002
	PHYSICAL FIGHT	-.43	.510	-.027	-.319	.055
	Time of Play	-.367	.083	-.025	-.441	.007
	Irritability	-.599	.044	-.019	-.372	.000
	violent video exposure	-.671	.010	-.120	-1.811	.007
	Gender	.319	.254	.057	1.257	.021
	grade	.563	.060	.040	.895	.037
	AGE	-.134	.082	-.089	-1.639	.000

^a Dependent Variable: Argument with teacher

* Gender 1 = Male, 2 = Female

Discussion

In the present research, video game violence exposure was a significant predictor of physical fights, even when gender, irritability, and weekly amount of video game play were statistically controlled. Each of the hypotheses was supported by the results of the study. Based on the GAM, it was hypothesized that exposure to video game violence would be positively correlated with irritability. This hypothesis was generally confirmed. Irritability was correlated significantly with three measures of violent content: the amount of violence adolescents like to have in video games, whether they like more or less violence now compared to 2 or 3 years ago, and the amount of video game violence they expose themselves to. It was hypothesized that exposure to video game violence would be positively related to arguments with teachers and physical fights. This hypothesis was confirmed. That youth who are more hostile also play more violent

video games raises questions of causality. Are young adolescents more hostile and aggressive because they expose themselves to media violence, or do previously hostile adolescents prefer violent media? Due to the correlational nature of this study, we cannot answer this question directly. Some studies have suggested that there is a bidirectional relationship (see Donnerstein, Slaby, and Eron (1994) for a review). GAM predicts a bidirectional effect, in which personological variables such as hostility affect media habits, which in turn reinforce and can modify the personological variables. Huesmann and colleagues (Lefkowitz, Eron, Walder, & Huesmann, 1972) have shown in long-term longitudinal studies that early media violence consumption habits predict later aggressive behaviors, but that early aggressive behaviors do not predict later media violence consumption habits. Some studies have suggested that personality traits such as hostility may moderate the effects of media violence (e.g. Lynch, 1994, 1999; Anderson & Dill, 2000). Indeed, GAM is designed to accommodate these moderator variables. This is an important issue to consider. It is possible that the people who are most affected by violent media are those who are most naturally aggressive, thus putting the most vulnerable at the greatest risk for increased aggression. There have not been very many studies designed to test this hypothesis, nor have the results been consistent. We recommend approaching the question of media violence from a risk factors perspective (Gentile & Sesma, 2003). Clearly, media violence is not the sole cause of aggression. But it is likely that it is one of several causes leading to it. Indeed, the American Psychological Association, the American Academy of Pediatrics, the American Academy of Child and Adolescent Psychiatry, and the American Medical Association recently issued a joint statement that there is a “causal connection” between media violence and aggressive behavior, but that it is a complex effect (AAP, APA, AACAP, & AMA, 2000). We hypothesize that children with multiple risk factors for violence are more likely to exhibit aggressive behavior. The present data lend support to this hypothesis. If they expose themselves to more video game violence, their odds of being involved in fights increase even more. This

approach may also be fruitful when considering differential effects correlated with gender. This study clearly shows that even after controlling for gender and other variables, video game violence exposure is a significant factor related to physical fights for both boys and girls. However, boys are generally at greater risk for physical fight, and they compound that risk by playing more violent games for greater amounts of time than girls play. In addition, regarding the amount of video game play-that amount would be negatively related to academic performance. This result is consistent with previous research both with video games (e.g. Anderson & Dill, 2000) and television (e.g. Williams, Haertel, Haertel, & Walberg, 1982). GAM also describes the etiology of aggressive behavior over the long term. GAM hypothesizes that playing violent video games over time leads to increases in aggressive personological and behavioral variables. The pattern of intercorrelations among personological variables (e.g. hostility, preference for violent content) and behavioral variables (e.g. arguments and physical fights) predicting aggressive behaviors are both consistent with the result of this study. This study is also limited by a reliance on self-report and by not being able to assess the type of violence (e.g. realistic vs. cartoon-style). However, it is likely that if the participants did not report truthfully, they would have been likely to try to portray themselves positively (e.g. underestimate their aggressive behaviors). This would have only reduced our ability to find significant results. Similarly, given that other research suggests that realism in media violence is linked with greater effects (e.g. Potter, 1999), our inability to separate realistic from cartoons portrayals only serves to weaken our ability to find significant results. Associations were found among video game habits, aggressive behaviors, and school performance. These results are consistent with the substantial amount of other media violence research, video game research, and the predictions from the GAM). Additional experimental and longitudinal research is needed to study the interaction between youth, parents, and educators in order to modify children's video game habits.

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