Predictors of Video Game Console Aggression

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Special Section: Videogames and Cognition

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This study was designed to investigate the aggression levels of college students found in the Northeastern part of the United States following exposure to video games. The 59 participants played their assigned game, Mortal Kombat on Nintendo Wii or Halo 2 on the Xbox, for 45 minutes with a partner. The researchers employed twelve t-tests (alpha adjusted to .004) and three multiple linear regressions to explore the difference of aggression levels in gender, violent video game, and predictors of aggression. Results showed no aggression differences in all twelve t-tests for the three aggression variables (physical, verbal, and general) pre and post-tests for gender or violent video game played. Additionally, there was no support found suggesting the violent video games, gender, and time spent playing video games *caused* aggression as previously touted by past researchers. In fact, the only significance found for predicting aggression were the pre-aggression scores in all three areas of measured aggression suggesting a need for proper control of variables and that aggression may be preexisting within the individual rather than caused by violent video game play.

Predictores de la Agresión en Videojuegos de Consola. Este estudio fue diseñado para investigar los niveles de agresión en estudiantes universitarios de la región noreste de los Estados Unidos después de la exposición a videojuegos. 59 participantes jugaron a un videojuego asignado, Mortal Kombat en Nintendo Wii o Halo 2 en Xbox, durante 45 minutos con un compañero. Se emplearon doce pruebas t (alfa ajustado a 0.004) y tres regresiones lineales múltiples para explorar la diferencia de niveles de agresión en género, videojuegos violentos y predictores de la agresión. Los resultados no mostraron diferencias en agresión a lo largo de las doce pruebas t para las tres variables de agresión (física, verbal y general) pre y post-tests para género o videojuego violento jugado. Además, no se halló soporte sugiriendo que los videojuegos violentos, el género y el tiempo dedicado a jugar videojuegos causen agresión. De hecho, el único resultado significativo encontrado para predecir la agresión fueron las puntuaciones pre-agresión en las tres áreas medidas, sugiriendo la necesidad de un control adecuado de las variables y que la agresión puede ser pre-existente en el individuo y no causada por videojuegos violentos.

Key Words:
Violent video games; Aggression; Console video games; Gender.

Palabras claves:
Videojuegs violentos; Agresión; Videojuegos de consola; Género

1. Introduction

With the increase of aggression depicted in **young adult's media, res**earchers have asserted that there has been an associated rise in acts of aggression. This assertion has opened a new area of concern for researchers of media and has become a heavy focus of video game research (Anderson, 1997; Anderson, et al., 2003; Anderson & Bushman, 2001; Anderson & Bushman, 2002; Anderson & Dill, 2000; Anderson & Murphy, 2003). Video games have become increasingly graphically sophisticated,

realistic, and have been shown to elicit substantial emotional reactions spurring concern that users may imitate the actions that they observe (Anderson & Bushman, 2001; Anderson & Dill, 2000; Hilgard, Engelhard & Bartholow, 2013; Przybylski, Ryan & Rigby, 2009; Scott, 1995; Uhlmann & Swanson, 2004).

The content and effects of violence in video games have additionally been seen as a major concern in the United States and other countries such as Australia. In response, classification systems have

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been created with the hope of establishing important rating criteria. While the United States utilizes the Entertainment Software Rating Board (ESRB) system of classification, other countries, such as Australia, are still developing theirs. Until recent times, but while still a prevalent issue, there has been difficulty in maintaining an appropriate classification system to account for the contents, themes, and aesthetics featured in violent video games in Australia. Given the nature and concern surround violent video games the Australian Government published a literature review examining the impact of playing violent video games on aggression (Australian Government Attorney-General's Department, 2010). The review ultimately concluded that the harmful effects resulting from playing violent video games have not been persuasively proven or disproven and thus the effects of violent video games on aggression is contested and inconclusive. However, not long after the publication of this review and the introduction of an R18+ classification in 2013, issues still remain regarding the classification of violent games. As such, new titles that fall outside of the strict Australian classification criteria are often rejected or are required to adjust video game content (i.e. graphics, interaction, and the removal of particular scenes) in order to conform to the rating system. Games such Syndicate, Reservoir Dogs, and Hotline Miami 2 (Serrels, 2015) have all been refused classification and thus banned from sale within Australia. However, while games such as BMX XXX, Silent Hill: Homecoming, and Left 4 Dead 2 were originally refused classification, their edited versions conformed to the criteria for classification and thus eventually were permitted. Recent changes to the classification within Australia has the country undergoing a 12 month trial (beginning from April, 2015) of an online game classification tool created by the International Age Rating Coalition (IARC) (Barlow, 2015).

The United States' American Psychological Association (APA) more recently provided a press release "confirming a link between playing violent video games and aggression, but, "finds insufficient research to link violent video game play to criminal violence" (APA, 2015). While their research has been heavily suggested by the board itself to be rigorous and generalizable to all research on violent video games, critics have spoken against the committee that they only utilized specific studies from the year

2009 until 2013 and appeared to "select scholars with clear anti-media views (two had previously signed an amicus brief supporting attempts to regulate violent video games…)" placing the committee's consensus in substantial doubt (Fudge, 2015; Futter, 2015).

As of late, researchers have suggested that aggression appears to be more prominently associated with videogames than with other forms of violent media due to players mandatorily role-playing as the aggressors in video games in order to progress (Anderson & Bushman, 2001; Anderson & Dill, 2000; Arriaga, Esteves, Carneiro & Monteiro, 2006; Dill & Dill, 1998; Funk et al., 2002; Larkin, 2000; Robinson, Wilde & Navracruz, 2001). This *identification* with aggression characters reportedly affects both genders. However, past research proposes men tend to be more aggressive in nature than women (Anderson, 2000a, 2000b), when playing violent video games; while women tend to experience greater increases in aggression from baseline points compared to men (Anderson & Murphy, 2003; Bartholow & Anderson, 2002; Funk, et al., 2002). This increase in aggression reportedly occurs only for a short period of time after playing (Anderson & Bushman, 2001; Anderson & Dill, 2000; Arriaga, et al., 2006; Bartholow & Anderson, 2002; Dill & Dill, 1998). Although, despite the increasing fidelity of graphics and hardware capabilities, little appears to be known about the long-term effects of videogame aggression on the behaviors of video game players.

In contrast, other prominent media researchers have suggested that playing video games has no impact upon their aggression levels and further suggests that these assertions are based upon biased data sets, an inability for recreation of the studies, effect sizes that are too small, that correlation does not insinuate causation, and that they, other media researchers, propose an incitement of moral panic (Ferguson, 2013; Ferguson, 2007). Furthermore, Przybylski, et al, (2009) researched the motivational role of violence in video games and discovered frustration of the video game and level components played a larger role in post-aggressive tendencies instead of the violent game itself. Additionally, it was determined individuals with higher traits of aggression preferred games with a higher level of violent content.

The violent content of videogames appears enhance the emotional appeal of a videogame as

suggested by some researchers (Jansz, 2005; Olson, 2010). Depending on the videogame, the amount of violent content as well as the type of violence presented varies. However, one consideration for why youths engage with violent video games is not to replicate the situations that they are exposed to but rather to engage in the experiences that these types of games provide. Olson (2010) suggests that gamers enjoy using violent objects (i.e. guns and other weapons) with the intention of innovating ways to utilize them in-game, albeit to master their abilities or to find intuitive ways to destroy enemies. Furthermore, Olson (2010) **infers that gamer's** engagement with such items may also reflect the aesthetics effects (i.e. explosions) that result in their use, and not the act of violence itself. Therefore, the intention of the gamer may be none other than to engage and test out solutions to a number of different in-game scenarios. This premise is further promoted by Jansz (2005) who refers to violent video games as a safe haven for activity where youths are able to experience emotions. Thus, videogames can afford the ability for gamers to explore and process different types of emotions in their own time, including emotional content that may be considered to be controversial in our current society. As such, it is easy to state much is unknown about playing video games and the possible impact upon the player.

According to self-reports in the United States, video game play may increase aggression for a short period of time after individuals have stopped playing violent games (Dill & Dill, 1998). Anderson and Dill (2000) examined the effect of violent content in video games on human aggression after participants played. The sample included 210 college students (104 women) from an introductory psychology course. The participants played either Wolfenstein 3D or Myst, three separate times and then completed three aggression measures. After playing the video games, the college students who played the more violent video game (Wolfenstein 3D) responded more aggressively than the college students who played the non-violent video game (Myst). Consistent with this finding, Arriaga et al. (2006) assessed the hostility levels after playing violent and non-violent video games of 87 undergraduate students (34 women). The college students were assigned to one of four conditions and after they were done playing the assigned videogames, they completed surveys.

Results showed that the college students who played the more violent videogame showed more state hostility afterwards then those who played the low violence game. However, these findings have been refuted as inconsistent, biased, and having smaller impacts than described within the studies by the authors (Ferguson, 2013; Ferguson, 2007).

Additionally, aggressive behavior observed post exposure to violent videogame play appears to be also subjected to a number of parameters; such as mood prior the initial exposure and the personality type of the player in question (Unsworth, Devilly & Ward, 2007). Unsworth, et al., (2007) conducted a study that included 107 adolescent students (ranging from years 8, 9, and 10) from one hundred schools from the Eastern and Southern Metropolitan Regions of Melbourne, Australia whose anger levels would be measured before, during and after violent game play. The study found that participants who demonstrated non-aggressive personalities appeared to experience no change in aggressive emotions. However, participants who exhibited more aggressive tendencies tended to experience an increase in anger while those who were angry prior to playing experienced a decrease in anger. Overall, the study concluded that despite exposure to violent video games, exposure was not linked with aggressive emotions.

1.1. Present Study

To further understand the potential differences in aggression levels following videogame playing and its connection to gender and game, this study was designed. It was hypothesized that men would score significantly higher in aggression than women at baseline and post-game playing. Consistent with past research, it was expected that post-videogame rises in aggression would occur from the video game intervention. Examining popular video game systems, it was expected that the Xbox game would produce a statistically different rise in aggression level than the Wii game. Finally, pre-test aggression scores were expected to be positively modeled as a main predictor of post-test aggression levels when controlled for covariates. Gender differences were expected among these associations.

2. Method

2.1. Participants

Participants for this study included 59 College

students from the Northeastern area of the United States, of whom 46% were men. The majority of the students were white (83%) and from working to middle-class family backgrounds. The mean age of the participants was 20.59 years old (SD = 1.93). College statuses were approximately represented at 25% each (range 22% to 27%). Some students were eligible for extra credit in their college classes for their participation.

2.2. Setting

For testing, a classroom capable of seating a maximum of 40 students was prearranged such that all desks were in rows facing forward and one foot apart in a horizontal direction. At the front of the room was either an Xbox or a Wii console, two controllers pertaining to the game console, a videogame or projector and projector screen. An experimenter greeted groups of two students and asked them to select prearranged seats in front of the appropriate projector screen with the appropriate console to play. The video game systems were in two separate rooms and the students only saw and participated on one of the systems while participating in the study.

2.3. Stimuli

The videogames that participants were required to play were Halo 2 for the Xbox and Mortal Kombat: Armageddon for the Wii. These games were chosen for their violent content, use of an aggressor in the game, the excitement of the game, aggression utilized in the controls, the playability of the game, and extreme popularity. The video games were two fighting games with brutal violence and very graphic images, both rated M for mature (ESRB, 2015). Before administration of the main video game, participants played two practice/warm-up games. They were Forza Motor Sports for the Xbox and Bowling for the Wii. These games were picked for practice on the systems because of their ease of use and to get the player used to the controllers of the systems.

Forza Motor Sports is a car racing game, in which players drive cars around a pre-designated course in competition for first after a certain number of laps. There is very little graphic violence, if any at all, it pertains to the destruction of the car's aesthetics self and it allowed the player to obtain familiarity with the console and controls. Forza Motor Sports is rated E for Everyone by the Entertainment Software Rating Board (ESRB, 2015).

Bowling for the Wii is a Wii Sports game. Players bowl as they would in real life ten frames to see who can get the highest score possible. There is no graphic violence in this game, but it allowed the player to obtain a general idea about the controls for the video game and console. Wii Bowling is rated E for Everyone by the Entertainment Software Rating Board (ESRB, 2015).

Halo 2 is a first-person shooter videogame, in which players use an arsenal of weapons, from realistic to futuristic, to destroy their opponent. The in-game deaths can be very gruesome and detailed. Blood is usually splattered around the body upon death. The environment is 3-D with each player being capable to move around the level until the limit is reached. Halo 2 is rated M for Mature by the Entertainment Software Rating Board (ESRB, 2015).

Mortal Kombat is a third person fighting game, in which the player's own hands and personal weapons are used to kill the opponent. The deaths are very gruesome and detailed. Blood is usually splattered around the arena after each hit of the opponent with special death scenes when a combination of buttons are used. The environment is 3-D with the capability of the player to move in all directions in order to subdue his or her opponent. Mortal Kombat is rated M for Mature by the Entertainment Software Rating Board (ESRB, 2015).

2.4. Measures

A short demographics questionnaire was administered to gather information concerning participant's background and experiences. The questionnaire consisted of questions related to age, gender, race, and current enrollment college status. Additionally, items related to videogame playing and preferences were included.

In gathering participants' baseline aggression level, the Aggression Questionnaire (Buss & Perry, 1992) was completed by participants. The scale consists of 29 items rated on a 5-point scale ranging from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). The 29 items represent four subscales, representing feelings about physical aggression (nine items), verbal aggression (five items), anger (seven items), and hostility (eight items). High scores on the subscales indicate higher physical aggression, verbal aggression, anger, and hostility. Reported reliabilities are moderate to high with alpha coefficients of .85 for physical aggression,

.72 for verbal aggression, .83 for anger, and .77 for hostility. The overall total reliability score is a .89 (Buss & Perry, 1992).

Regarding participants' post-aggression level, the Aggression Inventory (Gladue, 1991) was administered and completed. The scale consists of 30 items rated in a 5-point scale ranging from 1 (*does not apply at all to me*) to 5 (*applies exactly to me*). However, only 20 out of the 30 items represent four subscales, representing feelings about the physical aggression, verbal aggression, impulsive/impatient, and avoidance. High scores on the subscales indicate high physical aggression (four items), verbal aggression (seven items), impulsive/impatient (seven items), and avoidance (two items). Reported reliabilities are moderate to high with alpha coefficients at .76 for physical aggression, .79 for verbal aggression, .78 for impulsive/impatient, and .68 for avoidance (Gladue, 1991). Ten questions were omitted because they had no relevance to the study and were not indicative or part of the primary subscales physical aggression, verbal aggression, impulsive/impatient, and avoidance.

Although different aggression inventories were utilized, they have been reported to measure the same conceptual ideas. Archer, Kilpatrick and Bramwell (1995) compared the two aggression inventories through intensive testing. They found high correlations between the two inventories suggesting similar measuring of the same construct. Additionally, anger was observed to be a primary factor in assessment of aggression tendencies. Archer, et al., (1995) reported when anger was extrapolated or dismissed from the other subscales, the correlations lowered substantially. Overall, due to the verbal and physical aggression subscales from both questionnaires high correlations with one another, they were the only scales used for pre and posttest measures and statistical analyses along with the creation of a general aggression score combining the two scores.

2.5. Procedures

Participants was sought from a variety of locations on campus, including dorms, classrooms, and the cafeteria. Students were asked to sign-up for appointments and were given a reminder slip including the time, date, and location of their appointments. The students arrived in pairs or by themselves and they were mixed by gender to ensure

male vs. male, female vs. female, and male vs. female. Upon arrival at the designated classroom, participants were asked to take prearranged seats and read and sign the informed consent. Following informed consent procedures, participants were provided with the demographics questionnaire and the Buss and Perry Aggression Questionnaire as an aggression baseline. The experimenter explained how to play the game by going over the controls of the game and allowing time to warm-up using the controls on one of the two practice games. The experimenter then let the students practice on the systems for up to ten minutes before beginning the aggressive videogame play task.

After ten minutes of warm-up, students were randomly assigned to one of the two violent video games so an equal number of men and women played each game. Pairs of students played each other for 45 minutes. Students that played Mortal Kombat were competitors with only one student being declared victorious in each pairing, whereas the other pair played through parts of the storyline of Halo 2 helping each other to win the level. The students continued to play until their allotted time ended. Before departure, participants completed the Aggression Inventory as a post-test aggression measure.

2.6. Statistical Analysis

To examine whether which gender scored higher in aggression at both baseline and post-game playing, six independent sample t-tests were computed, three for baseline and three for post-game aggression. An additional six independent sample t-tests were computed for Wii and Xbox aggression levels three for baseline and three for post-game. This totals 12 t-tests and required a Bonferroni correction in order to control for error. Therefore the alpha for significance was corrected and adjusted to .004 to significantly control for error (.05/12 = .004) (Gravetter & Wallnau, 2008).

Three multiple linear regressions were conducted to examine whether pre aggression scores, gender, and/or game played predicted post aggression scores as the dependent variables and pre aggression scores, gender, and video game played as independent variables. Assumptions dealing with outliers, collinearity of data, independent errors, random normal distribution of errors, homoscedasticity, linearity of data, and non-zero variances were met

suggesting a robust sample.

3. Results

Videogame participants included 59 young college students, of which 90% surveyed indicated that they had access to video game systems, with 75% owning at least one video game system themselves. Additionally, 66% stated that they preferred to play with someone and the average playing time per week was 10.5 hours. Participants averaged about 3.3 days a week of playing video games and each day spent 7.5 hours playing their video games. When presented with a list of game genres, the genre most preferred was adventure games (see Table 1).

Table 1.
Participant Preferred Played Genre, N = 59

Genre	Number of Participants	Percentage
Adventure	34	57.60
Action	33	55.90
Fantasy	27	45.80
Racing	26	44.10
Role-Playing	23	39.00
Strategy	23	39.00
Fighting	21	35.60
Sport	19	32.20
First Person Shooter	19	32.20
Other	8	13.60

Table 2.
Means of Aggression Scores Across Gender, Males (n = 27), Females (n = 32)

Pre/Post Test	Aggression Scales	Gender	M	SD	M Difference	p
Pre-Test	Physical Aggression	Male	22.63	6.07	4.29	.02
		Female	18.34	7.69		
	Verbal Aggression	Male	15.45	4.81	.15	.90
		Female	15.00	3.89		
	General Aggression	Male	37.78	8.20	4.43	.08
		Female	33.34	10.27		
Post-Test	Physical Aggression	Male	9.22	3.39	1.57	.09
		Female	7.65	3.54		
	Verbal Aggression	Male	19.33	4.89	2.33	.07
		Female	17.00	4.61		
	General Aggression	Male	28.56	6.75	3.90	.04
		Female	24.66	7.48		

Table 3.
Means of Aggression Scores Across Console Games, Wii (n = 31), Xbox (n = 28)

Pre/Post Test	Aggression Scales	Game	M	SD	M Difference	p
Pre-Test	Physical Aggression	MK	18.87	6.41	3.02	.11
		Halo	21.89	7.91		
	Verbal Aggression	MK	14.16	3.11	1.91	.10
		Halo	16.07	5.19		
	General Aggression	MK	33.03	7.54	4.93	.05
		Halo	37.96	10.96		
Post-Test	Physical Aggression	MK	7.71	3.08	1.40	.13
		Halo	9.11	3.90		
	Verbal Aggression	MK	17.42	4.40	1.37	.28
		Halo	18.79	5.28		
	General Aggression	MK	25.13	6.46	2.76	.15
		Halo	27.89	8.12		

Note: MK = Mortal Kombat. Wii = Mortal Kombat, Xbox = Halo.

For evaluating the model of the linear regression, the enter method was utilized. It was found that pre-aggression scores primarily explained a significant amount of the variance in the value of post-aggression scores overall for physical (F = 9.24, $p <$ .001, R^2 = .52, $R^{2 Adjusted}$ = .46), verbal (F = 5.49, $p <$ .001, R^2 = .39, $R^{2 Adjusted}$ = .32), and general (F = 7.88, $p <$ .001, $R2$ = .48, $R2$ Adjusted = .42) aggression scores. It is

important to note that gender was calculated as significant in model 2 in individual effects, but became non-significant when additional variables were entered into the model (see Tables 4 and 5).

4. Discussion

This study was designed to understand further differences in aggression associated with console video game playing. Past research has suggested that after playing videogames, aggression levels significantly rise and are higher for men, but that women show a higher jump in aggression for post-game playing (Anderson & Bushman, 2001; Anderson & Dill, 2000; Scott, 1995; Uhlmann & Swanson, 2004). However, the results of this study suggest the opposite; that aggression levels did not appear to rise after the intervention. However, this study did show

that pre-aggression scores were the main predictor of post-aggression scores; not the game or game play. The intervention of the different games on the two systems produced no significance and no significant gender differences were observed pre and post-test.

Examining gender differences among the participants, results shows males had higher pre-test aggression scores when compared to females, but this deviation was not consistent with the post-test aggression scores where the differences were observed to be less. Furthermore, the disparity did not reach statistical significance suggesting no significant differences emerged in all three aggression variables (see Table 2).

Table 4.
Multivariate Linear Regression Analysis: Physical, Verbal, & General Aggression Coefficients, N = 59

Variable	Individual Effects			Full Model Effects		
	b (SE)	β	p	b (SE)	β	p
Post-Physical Aggression						
Game Played	1.40 (.91)	.20	.13	.40 (.71)	.06	.57
Gender	-1.55 (-.22)	-.22	.09	-.17 (.87)	-.02	.85
Length of Time Playing VGs	.04 (.09)	.07	.65	-.03 (.07)	-.06	.64
Average Days/Week Playing VGs	.104 (.23)	.08	.65	-.01 (.19)	.04	.97
Average Hours/Week Playing VGs	.08 (.07)	.21	.25	.01 (.05)	.04	.79
Pre-Physical Aggression Score	.35 (.05)	.72	<.001**	.34 (.05)	.70	<.001**
Post-Verbal Aggression						
Game Played	1.37 (1.26)	.14	.28	.13 (1.08)	.01	.90
Gender	-2.32 (1.28)	-.24	.07	-1.72 (1.36)	-.18	.21
Length of Time Playing VGs	.08 (.12)	.09	.64	-.03 (.11)	-.04	.78
Average Days/Week Playing VGs	.49 (.31)	.27	.11	.10 (.30)	.05	.75
Average Hours/Week Playing VGs	.08 (.09)	.15	.42	.04 (.08)	.08	.61
Pre-Physical Aggression Score	.64 (.12)	.57	<.001**	.61 (.13)	.54	<.001**
Post-General Aggression						
Game Played	2.76 (1.90)	.19	.15	.30 (1.54)	.02	.85
Gender	-3.87 (1.85)	-.26	.04*	-1.37 (1.88)	-.09	.47
Length of Time Playing VGs	.12 (.18)	.09	.52	-.08 (.16)	-.06	.61
Average Days/Week Playing VGs	.60 (.46)	.22	.20	.15 (.41)	.06	.71
Average Hours/Week Playing VGs	.15 (.14)	.20	.27	.03 (.11)	.04	.77
Pre-Physical Aggression Score	.52 (.06)	.68	<.001**	.49 (.09)	.63	<.001**

Note: b = Unstandardized Coefficient, SE = Standard Error, β = Standardized Beta Coefficient
*p <.05, ** p <.001.

Table 5.
Multivariate Linear Regression Analysis: Model Summary of Physical, Verbal, & General Aggression Variances, N = 59

Variable	R	R^2	Adjusted R^2	F	p	R Square Change	F Change
Post-Physical Aggression							
Model 1	.20	.04	.02	2.36	.13	.04	2.36
Model 2	.30	.09	.06	2.71	.08	.05	2.98
Model 3	.30	.09	.04	1.85	.15	.00	.21

	R	R2	Adjusted R2	F	p		
Model 4	.31	.10	.03	1.42	.24	.00	.21
Model 5	.34	.12	.04	1.42	.23	.02	1.37
Model 6	.72	.52	.46	9.24	<.001**	.40	42.77
Post-Verbal Aggression							
Model 1	.14	.02	.00	1.18	.28	.02	1.18
Model 2	.28	.08	.05	2.37	.10	.06	3.51
Model 3	.29	.09	.04	1.70	.18	.01	.41
Model 4	.36	.13	.06	1.97	.11	.04	2.62
Model 5	.37	.14	.06	1.70	.15	.01	.67
Model 6	.62	.39	.32	5.49	<.001**	.25	21.24
Post-General Aggression							
Model 1	.19	.04	.02	2.11	.151	.04	2.11
Model 2	.33	.11	.07	3.30	.04*	.07	4.36
Model 3	.34	.11	.06	0.32	.09	.01	.42
Model 4	.37	.14	.08	2.18	.08	.03	1.68
Model 5	.40	.16	.08	2.00	.09	.02	1.25
Model 6	.69	.48	.42	7.88	<.001**	.32	31.47

Note: Model 1 = Game Played, Model 2 = Game Played & Gender, Model 3 = Game Played, Gender, & Length of Time Playing Video Games, Model 4 = Game Played, Gender, Length of Time Playing Video Games & Average Days/Week Playing Videogames, Model 5 = Game Played, Gender, Length of Time Playing Video Games, Average Days/Week Playing Videogames & Average Hours/Week Playing Video Games, Model 6 = Game Played, Gender, Length of Time Playing Video Games, Average Days/Week Playing Videogames, Average Hours/Week Playing Video Games & Pre-Aggression Scores, R = Correlation, R2 = Squared Correlation, Adjusted R2 = Adjusted Squared Correlation, F = F-Test For Regression.
*p <.05, ** p <.001.

The study was additionally designed to examine predictors of post-test aggression levels controlling for covariates. Overall, examining the individual effects of the variables game played, gender, length of time playing video games, average days/week playing video games, average hours/week playing video games, and pre-aggression scores of verbal, physical, and general aggression suggest only the three pre-aggression scores were an appropriate predictor of post-game playing aggression (see Table 4). In fact, evaluating the variances in Table 5, Model 6, suggests the pre-aggression scores accounted for 46% of the post-physical aggression scores, 32% of the post-verbal aggression scores, and 42% of the post-general aggression scores. Gender appeared as an important factor in Model 2 of the post-general aggression, but lost significance as other variables entered the model suggesting a spurious condition (see Table 5). These findings suggest a need for proper control of variables in regression models ensuring appropriate mathematical procedures and lower reported false positives. Other variables became less significant as the number of variables increased with the exception of the pre-aggression scores. Had they not been controlled for, spurious relationships would have arisen. These findings are in stark contrast to the research indicated in this paper, the press release by the APA, and reviews conducted by the Australian Government suggesting that video games cause aggression and violence (Anderson & Bushman, 2001; Anderson & Dill, 2000; APA, 2015; Australian Government Attorney-General's Department, 2010; Scott, 1995; Uhlmann & Swanson, 2004). In fact, these results suggest the opposite, that internal pre-state aggression is a much more and a statistically higher indication of post-state aggression after playing violent video games. The researchers additionally suggest this finding is indicative of aggression levels pre-existing within the individual instead of being *caused* by violent video game play.

A limitation of this study was the number of participants. This study was completed with only 59 participants of the Northeastern United States college population. While past studies have used similar participant's numbers, the researchers feel that more participants could have benefitted the study. However, it is additionally important to note that this sample size is substantial enough to draw conclusions. Additionally, two different aggression scales were used for pre and post testing although they have been researched and determined to measure the same conceptual ideas of aggression for physical, verbal, and general aggression (Archer, et al., 1995). Furthermore, other investigations might include non-violent games to obtain information about aggression levels in general with game playing.

Finally, additional questions in the scales may have helped to hide the true purpose of the scale possibly distracting the participant from the re**searcher's** intentions.

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