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THE EFFECTS OF GENDER IN VIOLENT VIDEO GAMES

by

SAMANTHA SABIN WATTS

Under the Direction of Kevin Swartout, PhD

ABSTRACT

Adverse effects of video game violence have been well documented in psychology research for decades. As technology advances, violence depicted in games becomes more realistic and features more diverse types of aggression. A new trend in violent games is the depiction of women as sexualized targets of violence. Research suggests that exposure to sexual content and violence in games can be harmful to both male and female players, but no studies to date have looked at specific differences in outcomes based on the victim's gender in a violent game. The present study examines how opponents' gendered appearance in a violent video game affects players' implicit attitudes related to gender and gender violence. By having 235 undergraduates play a game fighting either male or female opponents, I found that women who fought female opponents expressed more negative implicit attitudes toward women.

INDEX WORDS: Video games, Violence, Violence against women, Sexual Violence, Aggression, Desensitization

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SAMANTHA SABIN WATTS

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2018

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2018

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December 2018

DEDICATION

I would like to dedicate this thesis to my husband, my parents, my sister, and my incredible lab mates. Without your constant encouragement and support, none of this would have been possible. I am forever thankful for your love and support.

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1 INTRODUCTION

The video game industry is rapidly growing as more Americans report playing video games each year. Since 1998, video game sales have increased from 4.8 billion to over 14.8 billion dollars annually (Entertainment Software Association [ESA], 2015). In 2015, video games were a 23 billion dollar industry with 155 million Americans reporting playing video games (ESA, 2016). Unfortunately, many of the popular video games that Americans play feature themes of violence and objectification of women. Years of research suggest that violent video games, particularly those that feature objectified images of women, prime aggression (Anderson & Bushman, 2001) and increase tolerance of sexual harassment and sexism (Dill, Brown, & Collins, 2008; Stermer & Burkley, 2015; Driesmans, Vandebosch, & Eggermont, 2014). Although no current video game related studies have linked engaging in violence against women in a game to greater acceptance of real-life violence against a woman, several studies have found that viewing filmed violence against women causes viewers to become desensitized to the behavior (Linz, Donnerstein, & Adams, 1989; Linz, Donnerstein, & Penrod, 1984). When viewers become desensitized, they experience less sympathy for the victim of the violence. The present study aims to explore the effects of playing a video game that includes violence against women on subsequent implicit attitudes toward women and sensitivity to depictions of violence against women.

Some video games can offer benefits to players such as improving health, increasing social interaction, and decreasing depressive symptoms (ESA, 2015). Video games that feature prosocial elements, such as teamwork and cooperation, can have positive social and educational effects (Greitemeyer & Mügge, 2014; Prot, Anderson, Gentile, Brown, & Swing, 2014). Although violent and graphic video games are very popular, many academic researchers have

questioned whether playing violent video games may have adverse effects such as increased aggression and other anti-social behaviors (Anderson & Bushman, 2001; Sherry, 2001).

The popularity of violent and sexist content in video games has been a long-standing trend. An early content analysis concluded that an alarming number of favorite video games included negative and objectifying depictions of women, as well as the use of aggression as a mechanism for problem-solving (Dietz, 1998). Although male characters appear more often in popular video games, female characters are more likely than male characters to be shown in sexually revealing clothing, partially or fully nude, with unrealistic body proportions (Downs & Smith, 2010; Dill & Thill, 2007; Burgess, Stermer, & Burgess, 2007). Women are portrayed as “sex objects” in 28% of popular games, and nearly 80% of games involve violence or aggression as a main theme (Dietz, 1998). More recently, 21% percent of the most popular video games in 2014 were “shooter” games, meaning that the primary objective was shooting a gun at targets (human and inanimate) in the game. Another 6% of the most popular games were described as “fighting” games in which players’ primary problem-solving mechanism is fighting in the game (ESA, 2015). Of the top 20 most popular video games of 2014, eight were rated M, for mature, indicating that they may contain intense violence, blood, gore, sexual content, and/or strong language.

The ESA claims that playing violent video games does not lead to aggression or violent behavior, citing that as video game sales have increased since 1998, violent crime has steadily decreased in the US. Despite the ESA’s correlational claims, many academic researchers have found links between playing violent video games and negative outcomes such as increased aggression, decreased sympathy for victims of violence, and decreased sensitivity to violence (Anderson & Bushman, 2001; Gentile & Anderson, 2003; Greitemeyer & Mügge, 2014). One

novel study surveyed youth in the juvenile justice system for the first time regarding violent video games. This study found a correlation between delinquency and playing violent video games, such that youth incarcerated for violence were more likely to endorse playing violent video games (DeLisi, Vaughn, Gentile, Anderson, & Shook, 2012), suggesting that the link between violent games and aggression has real-life consequences for young players.

Despite many contrary mainstream assertions, there remains little debate in academia over whether playing violent video games relates to aggression and other negative outcomes. Just as research for decades has demonstrated a link between violent media and aggression (Bushman & Huesmann, 2006), research suggests that playing violent video games leads to a temporary decrease in prosocial behavior (Anderson & Bushman 2001; Gentile & Anderson, 2003), desensitization to violence, and loss of sympathy for victims of violence (Gentile & Anderson, 2003). Additionally, research suggests that exposure to objectified images of women in video games leads to greater tolerance of sexual harassment (Dill, Brown, & Collins, 2008).

1.1 The Role of Gender in Video Games

Although it is widely accepted that violent video games increase aggression, little is known about how players' gender and the gender of characters within the game may contribute to aggression and other adverse outcomes (Bartholow & Anderson, 2002). Much of the current video game research has yielded mixed results on aggressive outcomes and has focused primarily on male players (Eastin & Griffith, 2006; Staude-Müller, Bliesener, & Luthman, 2008; Bösche, 2010). Some studies have found that men are more negatively affected by violent video games than women (Bartholow & Anderson 2002; Fox & Potocki, 2016, Beck, Boys, Rose, & Beck, 2012), while others have found opposite effects, albeit with content from an early generation of video games (Cooper & Mackie, 1986).

One explanation for the gender differences seen in video game research could be due to trait aggression characteristics. Individuals with high trait aggression have more developed cognitive-associative networks for aggression (Berkowitz, 1990). When a person with high trait aggression is exposed to violent media, they may have a stronger reaction than someone with low trait aggression. For example, Kiewitz and Weaver (2001) found that after viewing violent media, participants with higher trait-aggressiveness responded more hostilely to a written scenario of interpersonal conflict and showed less sympathy for victims of violence. Individuals with high trait aggression may also become desensitized to violence in the sense that it takes a higher threshold of violent behavior to register as dangerous to them (Bushman, 1996). Although males and females experience anger at similar rates, males are more likely to display verbal and physical aggression and score higher on measures of trait aggression (Buss & Perry, 1992; Archer, 2004).

In addition to studying potential gender differences in the effects of violent video games, several studies have examined how different aspects of the games, such as character gender and opponent characteristics, contribute to gender differences in aggressive outcomes. Game characteristics, such as whether avatars are dressed in white robes or black robes, have been found to influence players' thoughts and actions (Peña, Hancock, & Merola, 2009). After controlling an avatar in either a black or white robe, participants completed a questionnaire to assess their attitudes toward attacking unarmed players. When players controlled avatars in black robes, they displayed more aggressive attitudes than those whose avatars wore white robes, saying they would be more likely to attack unarmed players. The researchers concluded that the color of the robes influenced players' thoughts and caused them to display more or less aggression.

It is possible that the features of a game can activate stereotypes, specifically those related to gender (Yao, Mahood, & Linz, 2010). After playing a game with or without sexualized female characters, male players completed a lexical decision task designed to measure men's ability to complete words that were sexually objectifying to women or not. They also completed a measure of their likelihood to sexually harass a woman. The researchers concluded that playing a game with sexualized female characters increased the accessibility of sexually-objective thoughts about women and their self-reported likelihood to engage in sexual harassment for male players (Yao, Mahood, & Linz, 2010). Additional research has shown that exposure to sexualized female characters in video games decreases women's self-efficacy as measured by the general self-efficacy scale (Behm-Morawatz & Mastro, 2009). Exposure to sexualized female characters has also been shown to increase rape myth acceptance and tolerance for sexual harassment for all players (Driesmans, Vandenbosch, & Eggermont, 2014).

Stereotypes are easily activated by exposure (Blair, 2002). Exposure to a video game can activate stereotypes, including negative gender stereotypes toward women. Stereotypes are thought to be automatically activated and therefore relatively stable and unchangeable (Blair & Banaji, 1996). However, a meta-analysis of the malleability of gender stereotypes revealed that they might be more elastic than previously thought (Lenton, Bruder, & Sedikides, 2009). The meta-analysis found that while the effects are often small, exposure to gender stereotype reducing interventions show some efficacy.

Research has demonstrated that the gender of the controlled character in a violent video game moderates the effects on subsequent aggression. There is mixed support for a connection between gender identification with the controlled video game character and aggression for female players. One study suggests that women who played a violent game with a female avatar

displayed more aggressive behavior in a competitive reaction time task where they administered punishments to an opponent than those who used a male avatar (Anderson & Murphy, 2003). Whereas another study suggests that players, both male and female, who controlled a male avatar behaved more aggressively afterward than those who controlled a female avatar (Yang, Huesmann, & Bushman, 2014). Players stereotyped men as being more aggressive than women, and therefore acted more aggressively in a task where they assigned an opponent to eat hot sauce after controlling a male avatar. The mixed results of avatar-related studies suggest that factors within the video game other than violent content may also contribute to cognitive outcomes, such as the gender of the opponent within the game.

Gender of the opponent in the game may elicit aggressive outcome differences between female and male players. Eastin (2006) measured players' aggressive cognitions after playing a violent game using a word completion task where participants fill in missing letters to form either an aggressive or non-aggressive word. The study found that when players controlled a female avatar fighting a male opponent their aggressive thoughts increased. Conversely, when players controlled a male avatar fighting a female opponent, aggressive thoughts decreased (Eastin, 2006). Overall, research suggests that the gender characteristics of both players and characters within the game influence players' cognitive outcomes. The present study aimed to clarify further how the gender of players and characters in violent video games contribute to cognitive outcomes, specifically players' gender biases and sensitivity to violence.

1.2 Priming Effects of Violent Video Games

Researchers have used a variety of theoretical approaches to explain how violent video games lead to negative outcomes, including social learning theory, the general arousal model, the general aggression model, and catharsis effects (Sherry, 2001). One widely-accepted model for

explaining how violent video games influence thoughts and actions is that violent video games prime aggression and negative mindsets (Yang, Huesmann, & Bushman, 2014). Once aggression is primed, subsequent thoughts and actions are filtered through an aggressive mindset. According to priming theory, stimuli in the environment activate related concepts in a person's memory, making the relevant schema more easily accessible (Huesmann & Kirwil, 2007). Playing a violent video game increases the accessibility of aggressive thoughts (Anderson, Carnagey, Flanagan, Benjamin, Eubanks, & Valentine, 2004), which suggests aggression is being primed.

Human behavior is highly susceptible to outside influence. People are often unaware that the external stimuli are contributing to their behavior. The human mind's ongoing stream of consciousness is continually making connections that can influence thoughts and behavior even after the stimulus is removed (Bargh, 2005; Huesmann & Kirwil, 2007). Researchers have often wondered how environmental cues can have such an influence on people's thoughts and behaviors without their awareness. Neuropsychological developments provide evidence that conscious intentions and behavioral systems are anatomically separate in the brain (Bargh, 2005). The brain works as an associative network in which exposure to violence may activate related aggressive ideas, thoughts, and feelings (Huesmann & Kirwil, 2007). After exposure to a stimulus or event, the thoughts, feelings, and behaviors associated with the event are primed for a short time (Bargh & Chartrand, 2000; Bushman & Huesmann, 2006). This revelation explains how mental processes can occur without conscious will and explains how behavioral influence can occur outside of a participant's awareness.

One particular type of priming is mindset priming. In mindset priming, participants are actively engaged in a goal-oriented task that primes a mindset within that particular context (Bargh & Chartrand, 2000). The mindset primed in the original task will carry over and be used

in a subsequent task. The participant's intentional goal-mindset in the first task will influence their behavior and decisions in a following task. Violent video games present an excellent tool for mindset priming. Players are actively involved in a goal-oriented state of mind where violence is being primed. Carry-over effects of mindset priming have been demonstrated in previous video- game research. For example, one study found that when players controlled avatars with negative connotations, such as an avatar dressed in a Ku Klux Klan (KKK) robe, they displayed more negative and aggressive thoughts and were less able to access positive concepts when completing a story writing task (Peña, Hancock, & Merola, 2009). The negative stereotypes associated with the KKK primed negative thoughts; although the participants were unaware, positive thoughts were suppressed in their minds. This example demonstrates how violent video games can be tools for mindset priming and how the primed mindset can produce carry-over effects into another task.

1.3 Desensitization to Violence Against Women

In addition to violence, many popular video games include negative or sexist depictions of women (Stermer & Burkley, 2012). In these games, women are often portrayed as sex-objects (Dietz, 1998). Research has shown that exposure to sex-stereotyped video game characters can increase prejudiced, stereotyped, and false beliefs about rape and acceptance of sexual harassment, especially for male players (Dill, Brown, & Collins, 2008; Stermer & Burkley, 2012). The process of desensitization that occurs when players are exposed to the violence and sexism often present in video games leads to the endorsement of rape myths and sexual harassment immediately after game-play (Fox, Ralston, Cooper, & Jones, 2015; Gabbiadini, Riva, Andrighetto, Volpato, & Bushman, 2016).

The desensitization hypothesis states that after prolonged exposure to violence, a person will become acclimated, and their negative reactions to violence will decrease (Carnagey, Anderson, & Bushman, 2007; Staude-Müller, Bliesener, & Griffith, 2008). Desensitization also reduces empathy for victims of violence (Linz, Donnerstein, & Adams, 1989), which may have concerning consequences when observers are exposed to violence against women. The process of desensitization toward sexual violence against women has been well studied in the context of violent films. For example, one study on this topic found that after repeated exposure to sexually-violent films, male participants expressed less sympathy for a real victim of domestic violence depicted in a documentary (Mullin & Linz, 1995).

Another negative consequence of desensitization is that observers of violence may perceive victims as less human. In one study, after playing a violent video game that involved killing small animals, participants perceived an out-group (immigrants) as having fewer human qualities than those who played a non-violent game (Greitemeyer & McLatchie, 2011). The effects of desensitization, such as decreased sympathy and dehumanization, have real-life implications. Due to the effects of desensitization, people who are exposed to violence are less likely to exhibit pro-social bystander behavior (Bushman & Anderson, 2009). When a person experiences diminished sympathy and humanization towards victims of violence, they may be less likely to intervene in an emergency situation.

For a person to intervene in a violent situation, they must first realize that something is happening and then interpret that what is occurring is an emergency (Latane & Darley, 1968). Research suggests that after playing a violent video game for just 20 minutes, participants are less likely to report that they heard a fight that occurred outside of their door, and if participants did report hearing the fight, they interpreted it as being less severe (Bushman & Anderson,

2009). The participant's failure to register that a fight occurred and their interpretations of the fight being less severe suggests that desensitization has occurred. There is evidence to suggest that desensitization may not only decrease emotional responses to media violence but may also translate into failure to intervene in real-life aggressive situations (Linz, Donnerstein, & Penrod, 1984).

2 THE PRESENT STUDY

The present study is informed by stereotype activation, priming theory, and the desensitization hypothesis to further explore how situational variables, such as player characteristics and video game content, influence players' cognitive states and desensitization to violence against women after playing a violent video game. Building upon previous video game research, the present study will examine how the gender of the opponent in the violent video game and the gender of the player interact to affect the player's implicit gender biases. Furthermore, drawing from theories on desensitization and priming, I predict that primed implicit biases toward gender will influence a person's sensitivity to violent cues within a video.

2.1 Research Question 1:

When people play violent video games, does the gender of the opponent characters affect the player's later desensitization to violence, and is that effect mediated by the player's implicit gender bias experienced immediately after playing the game (Figure 1)?

2.1.1 Hypothesis 1A:

Playing a violent video game against female opponents will result in players being desensitized to violence against women compared to those who fight male opponents.

2.1.2 Hypothesis 1B:

Implicit gender bias will mediate the relationship between opponent gender and desensitization to violence against women.

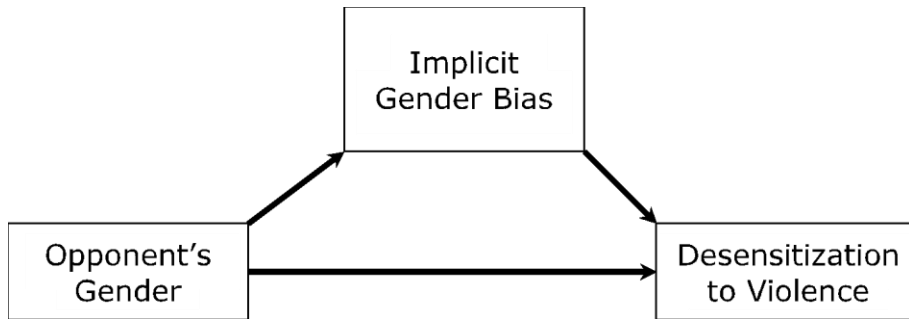


Figure 1 Conceptual Mediation Model

2.2 Research Question 2:

Does the gender of the player moderate the relationship between opponent gender and the player's implicit gender bias (Figure 2)?

2.2.1 Hypothesis 2A:

Male players who fight female opponents will have a more negative biases toward women than female players who fight female opponents (See Figure 3).

2.2.2 Hypothesis 2B:

Female players who fight female opponents will have a more positive bias toward women compared to female players who fight male opponents (See Figure 3).

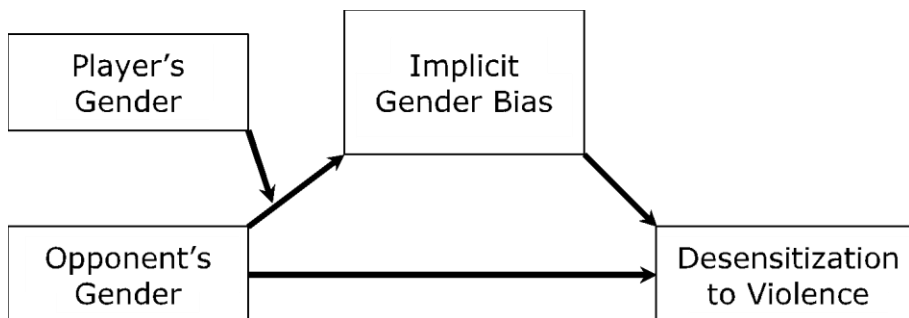


Figure 2 Conceptual Moderated Mediation Model

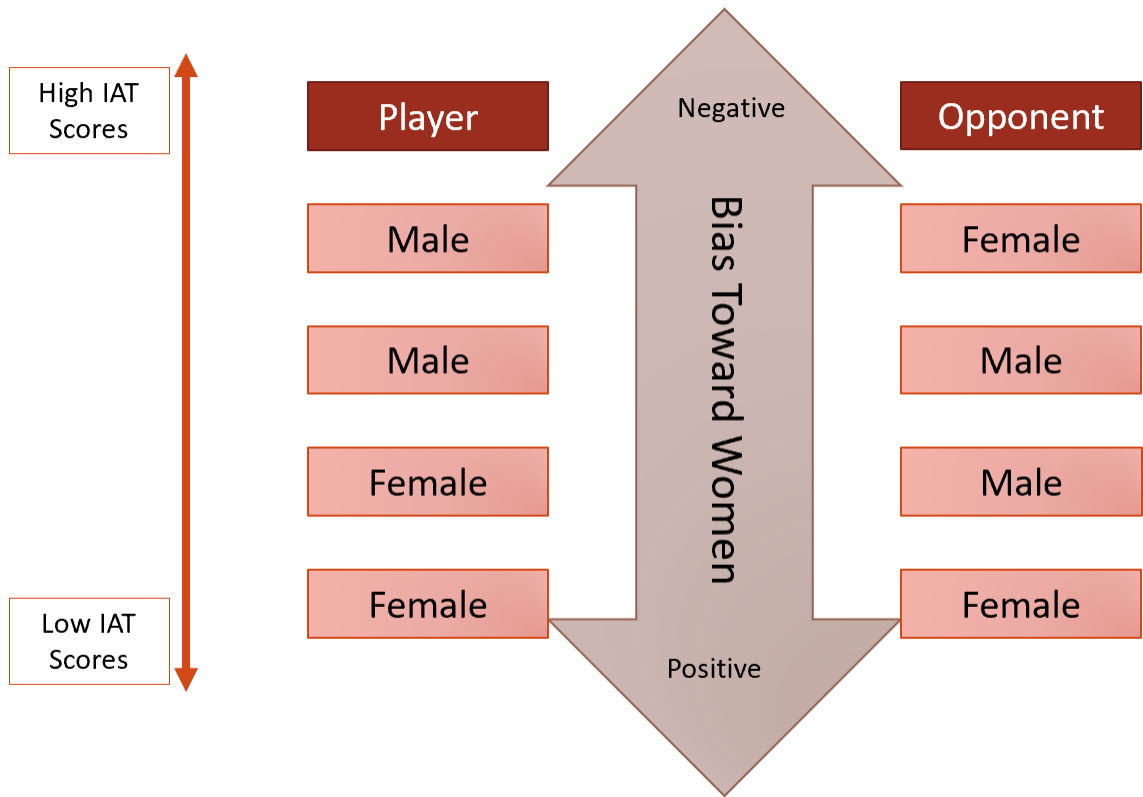


Figure 3 Visual Representation of Hypotheses 2A and 2B

3 METHODS

3.1 Participants

Participants were recruited using SONA, a research participant management system used to recruit university psychology students for voluntary research participation. Only students over 18 years of age were eligible for the study due to the video game content being rated M for mature. Students who participated in the current study were given course credit in exchange for their time at a rate of 1 credit per hour (90 minutes = 1.5 credits). A total of 318 students were recruited for the study, but only those who completed the entire procedure were included in the analysis. The final sample included 235 students (109 males, 126 females), of which 37% self-identified as Black, 23.4% Asian, 20.9% White, 11.5% Hispanic, and 7.2% described their race as 'Other'. Participants ranged from 18 to 38 years of age ($M = 19.69$, $SD = 2.21$) (See Table 1 for additional demographic information). Men were coded as 1 and women were coded as 0.

3.2 Procedure

3.2.1 Video Game Task

Participants were individually greeted by an experimenter upon arrival, escorted to a private lab room, and seated at a computer terminal. After providing informed consent, participants completed a basic demographic survey. Participants were then given basic instructions on how to play the popular fantasy first-person combat video game "Elder Scrolls V: Skyrim". Participants completed a 5-minute game tutorial, after which they were allowed to ask the experimenter questions about game-play. Once questions were answered, participants were left alone to play the game for 30 minutes. Participants were randomly assigned to play against either masculine or feminine opponents. The masculine and feminine traits of the opponents were accentuated so that their genders were stereotypical and unambiguous (See Figure 4). The masculine condition was

coded as 1 and the feminine opponent condition was coded as 0. All other aspects of the game remained consistent across conditions, including the game scenarios, the number of opponents, game settings, and difficulty levels. All participants played the game on the same software system; therefore, their movement patterns were identical; the only factor that differed across conditions was the opponent characters' physical appearance (masculine/feminine).

For this study, a first-person combat game was used in which the participants could not see the gender of their avatar. In first-person style video games, the player assumes the identity of the character in the game by seeing the game-world from the character's perspective. Research has shown that first-person games lead players to identify more with the character they are controlling compared with other vantage points (Anderson & Dill, 2000). Research suggests that players experienced greater game presence using a standard console rather than using a virtual reality device when playing a first-person game (Eastin & Griffiths, 2006). Because presence is linked to the priming effects of aggressive content, the present study utilized a standard console first-person interface (Eastin & Griffiths, 2006). After 30 minutes of video game-play, the experimenter entered the room and turned off the game. Participants were then asked to complete the study measures described in the following section.



Figure 4 Masculine and Feminine Video Game Opponents

3.2.1 Implicit Association Test

Individuals often use implicit attitudes to make judgments through automatic processes that are not under a person's conscious control. Unlike explicit attitudes, which a person can choose to express, implicit attitudes are resistant to self-monitoring and socially desirable responses (Greenwald, McGhee, & Schwartz, 1998). Greenwald and colleagues (1998) developed the implicit association test (IAT) as a means to measure implicit attitudes. The IAT works by having participants quickly match categories such as pictures of flowers with pleasant words and pictures of insects with unpleasant words. The task is then reversed such that pictures of flowers are matched with unpleasant words and pictures of insects are matched with pleasant words. The times taken to make the correct associations are recorded. Participants receive an IAT index score that is typically interpreted their implicit attitude toward the concepts of interest, such that better performance in the flower + pleasant condition compared with the insect + pleasant condition indicates a stronger positive bias towards flowers. The IAT has been used to measure a variety of implicit attitudes including racial, religious, and sexual orientation biases. IAT scores are suggested as better measures than self-report for socially-sensitive issues (Greenwald, Poehlman, Uhlmann, & Banaji, 2009).

Participants in the current study were asked to complete an IAT to measure their implicit attitudes towards gender. In the first part of the task, participants were asked to respond quickly with a left-hand key press to words representing male (e.g., "man") or positive concepts (e.g., "honest"), and with a right-hand key press to words representing female (e.g., "woman") or negative concepts (e.g., "hatred"). For the second part, the key assignments were switched; female and positive words shared a key response, and male and negative words shared a key response. The differences in response times for the two parts of the study were used to calculate

the attitude bias score for each participant, with higher scores indicating a greater negative bias towards women and more positive toward men (Greenwald et al., 2003). Scores closer to zero indicate a more neutral gender bias, not favoring male or female.

3.2.2 *Bystander Intervention Task*

After completing the IAT task, participants completed a video response task designed to assess their attentiveness to cues related to violence against women. Participants watched a video depicting a scenario of escalating intimate partner violence between a heterosexual college-age couple with the man as the aggressor. The video began with verbal aggression and progressed to the point of physical aggression where the man hits the woman. Participants were instructed to identify aggressive behaviors and cues of non-consent within the video by pressing “e” on the keyboard. Participants could press “e” for each cue they identified throughout the video. Participants also had the option to press “i” to indicate if and when they would intervene in the situation if they had been present. The number of cues participants identified was used to measure their desensitization to violence, with fewer key presses indicating more desensitization. After completing the video task, participants were debriefed and given credit for their participation.

3.3 Analysis Plan

The analyses were conducted using the PROCESS macro plugin for SPSS 25. A power analysis indicated that 150 participants would be required to predict the expected small effect sizes. With 235 participants, the current analysis is well powered to find the hypothesized effects at an Alpha level of 0.05.

The variables used for analysis include the opponent gender (whether participants played against a male or female avatar opponents), participants’ self-reported gender, IAT bias scores,

and the number of aggressive cues that participants identified in the video task. The number of aggressive cues identified is the operationalized measure for sensitivity to violence. Scores that fell beyond three standard deviations of the mean ($N=4$) were excluded from the analysis (Before exclusion: $N = 239$, $M = 13.58$, $SD = 16.73$; Post exclusion: $N = 235$, $M = 11.89$, $SD = 9.53$). Possible explanations for these outliers are discussed in the limitations section. Exclusion of the outliers did not significantly affect the results.

The proposed model involves moderated mediation (Figure 2). Model number 7 was used from Hayes, 2015 Process Macro plugin for SPSS. Mediation and moderation are often used to explain how and under what circumstances treatment effects are observed in research and can be combined to form a more integrated model (Hayes, 2015). In this case, the mediating variable that is responsible for causing the effect of the condition on the outcome is thought to be dependent on the moderator (Muller, Judd, & Yzerbyt, 2005). In the current study, the relationship between the condition (opponent gender) and the outcome (number of aggressive acts identified) is hypothesized to be mediated by implicit gender biases (Figure 1). The relationship between the condition and implicit gender biases is hypothesized to be moderated by the player's gender.

PROCESS computes indirect effects using the products of coefficients (Figure 3). Using PROCESS analysis, estimates will be calculated for the indirect effects of the predictor on the dependent variable through a mediator, depending on various levels of the moderator. To test the estimated indirect effect, PROCESS applied the bootstrapping method where the sampling distribution of the conditional indirect effect is not assumed to be normal. The indirect effect was bootstrapped to calculate the standard error and 95% confidence interval. If zero is not included in the confidence interval, then the results should be considered significant at the $p < .05$ level.

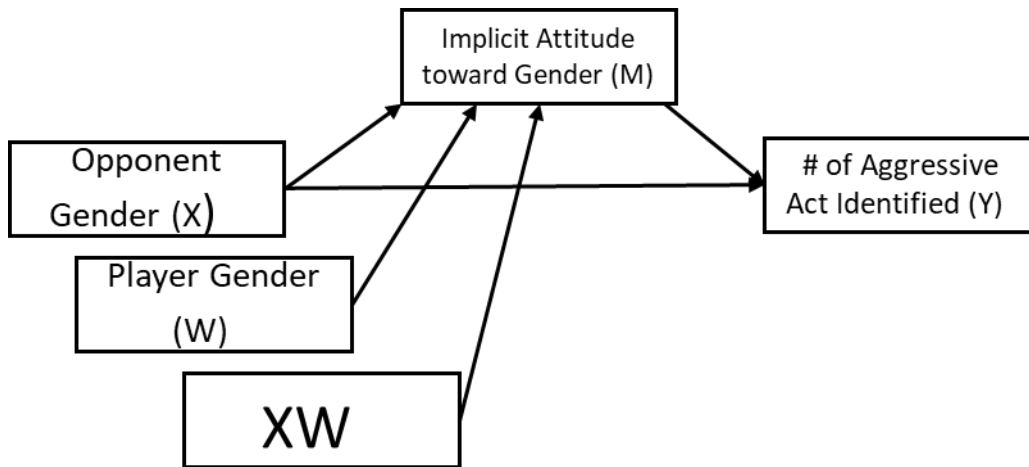


Figure 5 Moderated Mediation Statistical Model, Process Macro Model 7

4 RESULTS

4.1 Participant Characteristics

Technical malfunctions prevented some participants from being able to complete all the computerized tasks ($N = 79$). Those who were unable to complete the computer tasks did not have a usable score on the outcome variable. Only participants who completed the entire study protocol, therefore, were included in the final analyses. The final sample included 235 student participants (126 female, 109 male). Participants varied in age from 18 to 31 ($M = 19.69$, $SD = 2.21$), and were racially and ethnically diverse (see Table 1). A correlation matrix of all study variables and possible confounds was created to identify possible covariates (Table 2). Participants varied in levels of trait aggression as measured by the Buss Perry Aggression Questionnaire ($M = 4.12$, $SD = 3.72$). Trait aggression has been linked to susceptibility to video game violence and is correlated with gender bias in our sample (see Table 2); therefore, trait aggression was included as a covariate in the analysis to control its relation to the outcomes. Additional correlation analyses were conducted separately for men and women to detect possible gender differences. Relationship status and age are significantly correlated, suggesting that older participants were more likely to be a relationship/married/divorced. For men, relationship status was correlated with the number of cues identified. For women, age was correlated with the number of cues identified. Age and relationship status were not included in the model because they were equally distributed across conditions. No additional significant correlations were identified.

Table 1 Sample Characteristics

Characteristic/Demographic	Mean (SD) or %
Gender	
Male	46.4%
Female	53.6%
Age, in years	
	19.69 (2.21)
Race/Ethnicity	
White/European American	20.9%
Black/African American	37.0%
Hispanic or Latino	11.5%
Asian or Asian American	23.4%
Other	7.2%
Relationship Status	
Single	59.6%
Dating	38.3%
Engaged	0.9%
Married	0.4%
Separated/Divorced/Widowed	0.9%

Note: n = 235

Table 2 Correlations among all included and possible confounding variables

	Mean	SD	1	2	3	4	5	6	7
1. Condition	-	-	1						
2. Age	19.78	2.51	-0.05	1					
3. Relationship	-	-	0.03	0.32**	1				
4. BPAgg	4.13	3.70	-0.00	0.11	-0.05	1			
5. Gender	-	-	0.05	0.03	-0.11	0.51**	1		
6. IAT	-0.09	0.49	0.11	0.15*	0.00	0.32**	0.53**	1	
7. Cues	13.58	16.73	-0.02	0.17**	0.23**	0.06	0.03	-0.01	1

Note: Condition = male or female video game opponents, Age=in years, Relationship=relationship status, BPAgg= trait aggression via the Buss Perry Aggression Questionnaire, Gender = participant gender (Male = 1, Female = 0), IAT = Implicit Association Task bias score, Cues= Aggressive cues/acts identified by participant; * $p < .01$, ** $p < .001$

Table 3 Correlations among all included and possible confounding variables, Men Only

	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6
1. Condition	-	-	1					
2. Age	19.75	2.15	0.24*	1				
3. Relationship	-	-	0.05	0.35**	1			
4. BPAgg	6.15	4.66	-0.05	0.18	0.02	1		
5. IAT	0.18	0.46	-0.04	0.02	0.03	0.10	1	
6. Cues	12.21	11.15	-0.01	0.14	0.30**	0.06	-0.07	1

Note: n = 109, * $p < .01$, ** $p < .001$

Table 4 Correlations among all included and possible confounding variables, Women Only

	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6
1. Condition	-	-	1					
2. Age	19.63	2.27	0.10	1				
3. Relationship	-	-	-0.08	0.31**	1			
4. BPAgg	2.37	0.64	0.01	-0.05	-0.00	1		
5. IAT	-0.34	0.39	0.24**	0.23**	0.11	0.06	1	
6. Cues	11.62	7.90	-0.03	0.21*	0.16	0.01	0.03	1

Note: n = 126, * $p < .01$, ** $p < .001$

Participants' gender bias scores were measured by response times on the IAT. Negative scores indicate a preferential bias toward women and positive scores indicate preferential bias toward men. Scores closer to zero indicate a general lack of gender bias. The average IAT score was 0.09 with a standard deviation of 0.50. Participants' gender bias scores significantly correlated with age, gender, and trait aggression (see Table 2). When broken down by gender, we see that men have a positive mean IAT score ($M = 0.18$, $SD = 0.46$), whereas women have a negative mean IAT score ($M = -0.34$, $SD = 0.39$). IAT scores were significantly different for men

and women, with men having higher scores indicating a significantly more negative bias toward women, $t(233) = 9.43, p < 0.001$.

The number of aggressive cues participants identified in the video task varied from 0 to 58 ($M = 11.90, SD = 9.53$). A t-test was conducted to determine if there is a gender difference in the number of cues identified. Levene's test revealed that the population variances were not equal, $F(233) = 4.10, p < 0.05$, therefore the degrees of freedom were adjusted, and equal variances were not assumed. Ultimately there was not a significant difference in the number of aggressive cues identified across women and men, $t(190.96) = 0.46, p = 0.64$.

4.2 Mediation Results

The full moderated mediation model was tested in two steps using the PROCESS macro for SPSS (Hayes, 2013): first with the moderated outcome of gender bias and then with the mediated outcome of desensitization. For clarity, the mediation portion of the model will be discussed first before the portion of the model that tested moderation.

The mediation model included desensitization predicted by video game condition (i.e. masculine/feminine opponent), mediated by implicit gender bias (See Figure 1). This portion of the model addressed research question 1: *Among individuals playing a violent video game, does gender of the opponent characters affect the player's later desensitization to violence against women, and is that effect mediated by the player's implicit gender bias experienced immediately after playing the game?* I hypothesized that the gender of the opponents in a violent video game would influence players' sensitivity to violence against women, such that players who fought female opponents would be less sensitive to aggression directed toward a woman than those who fought male opponents. Also, I predicted that the relationship between opponent gender and desensitization would be mediated by the players' gender biases (i.e., IAT scores). The results

did not support this hypothesized mediation (See Figure 4). Neither opponent gender ($b = -0.25$, $t[231] = -0.19$, $p = 0.85$) nor gender bias ($b = -0.25$, $t[231] = -0.19$, $p = 0.85$ and $b = -0.58$, $t[231] = -0.43$, $p = 0.67$) significantly predicted desensitization scores. There was also no significant direct effect of video game condition on desensitization, $b = -0.25$, $t(231) = -0.19$, $p = 0.85$ (See Table 5).

4.3 Moderation Results

The second portion of the proposed model addressed research question 2: *Does the gender of the player moderate the relationship between opponent gender and the player's implicit gender bias?* I hypothesized fighting female opponents would lead to a more negative bias toward women for both male and female players.

There was a significant interaction between opponent gender (male opponent = 1, female opponent = 0) and player gender (male player = 1, female player = 0) predicting gender bias for female players, $b = -0.22$, $t(230) = -1.97$, $p < 0.05$; female participants generally favored women, but those who fought female opponents displayed significantly less preference for women compared with those who fought male opponents (See Figure 5). Male participants generally favored men, regardless of opponent gender. I expected that men who fought female opponents would have a more negative bias against women, but opponent gender did not significantly affect men's gender biases, $b = -0.33$, $t(230) = -0.41$, $p = 0.68$, (See Table 5).

Table 5 Moderated mediation results

	Estimate	SE	Ratio	p	LLCI	ULCI
Moderation Results						
IAT on						
Condition	0.18	0.07	2.45	0.01	0.04	0.33
Gender	0.58	0.08	7.00	0.00	0.41	0.75
Condition x Gender	-0.22	0.11	-1.97	0.05	-0.43	-0.01
Condition on (Conditional Effects of Moderator)						
Male	-0.33	0.08	-0.41	0.68	-0.19	0.13
Female	0.18	0.07	2.45	0.01	0.04	0.33
Mediation Results						
Aggressive Cues on						
Condition	-0.25	1.26	-0.19	0.85	-2.73	2.23
IAT	-0.58	1.35	-0.43	0.67	-3.23	2.08
Indirect Effects						
Condition via IAT					-0.63	0.46
Male					-0.11	0.38
Female					0.02	0.27

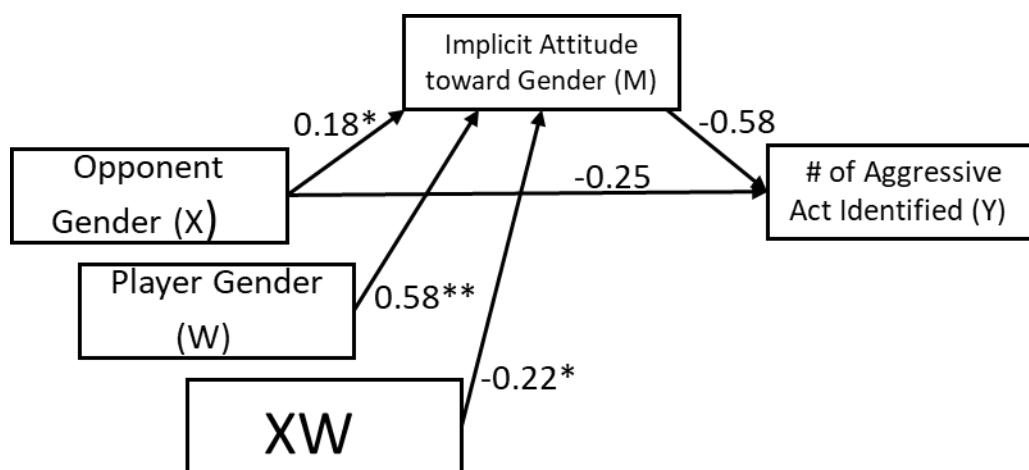


Figure 6 Moderated Mediation Statistical Model with Coefficients

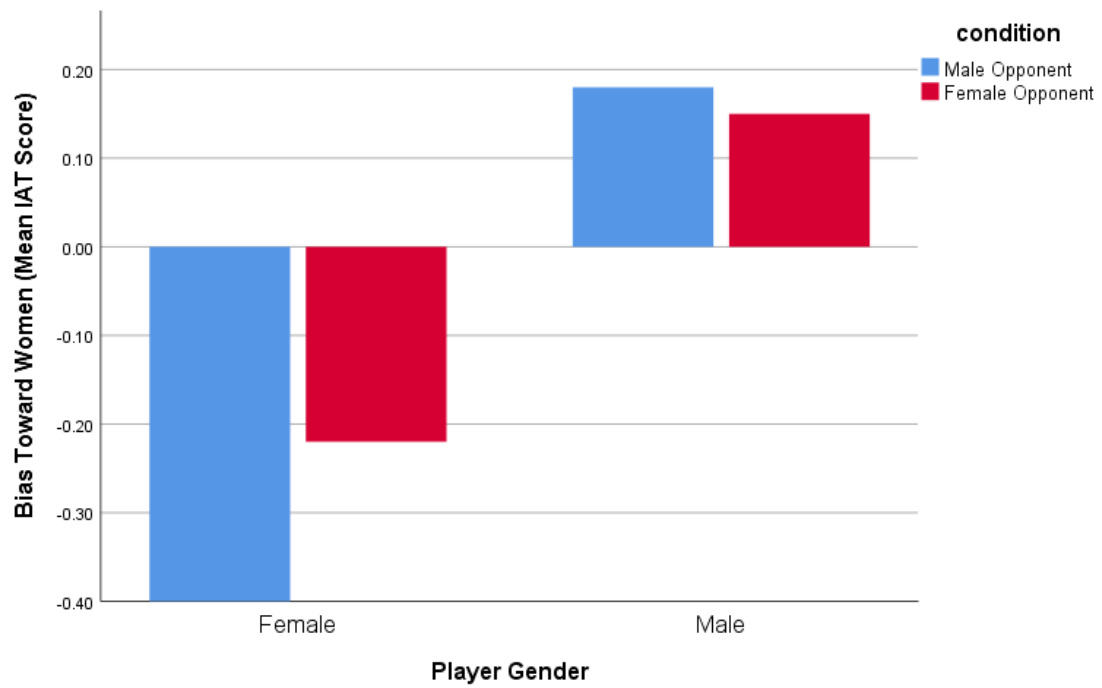


Figure 7 Bar Graph of Bias Toward Women (Mean of IAT Score) by Player Gender by Condition (Negative scores indicate positive bias toward women)

5 DISCUSSION

In this experimental study of 235 undergraduates, the characteristics of a violent video game influenced some players' implicit gender attitudes after a short period of game play. Although I did not find support for a link between implicit attitudes and sensitivity to violence, the gender of the opponents in a violent game impacted female players' implicit biases related to gender. I predicted that, for men, playing a violent game against female opponents would foster a general negative bias toward women and a desensitivity toward violence against women. I expected to find that female players who fought female opponents would show a more positive bias toward women than those who fought male opponents. The hypothesis was not supported: women who played a game where they faced female opponents experienced a more negative bias toward women immediately after playing than those who faced male opponents. The same effect was not present for men: men displayed a negative bias towards women regardless of opponent gender. It appears that men's gender bias is not as easily influenced by brief exposure gendered depictions in a violent game. Men's bias toward women is more negative than women's biases, but is not affected by opponent gender.

I expected to find that exposure to a strong counterstereotype of women would cause female players to show a positive attitude toward women. A previous study found that when women were exposed to counter-stereotypic examples of women, their negative gender stereotypes were reduced (de Lemus, Spears, Bukowski, Moya, & Lupiáñez, 2013). The researchers found that confronting a gender stereotype caused women to challenge the traditional roles in their thinking. I expected to see a similar effect when women were exposed to the violent and sexualized opponents in the video game. The results show that the opposite occurred: women showed a more negative attitude toward women after exposure to female opponents than male opponents.

Rudman and Phelan (2010) found that priming to a nontraditional gender role caused women show less empowerment as a result of comparison threat. It is possible that the violent and sexualized female opponent was threatening to the female players and caused them to adhere stronger to negative gender attitudes toward women.

Despite the growing body of research supporting the link between violent video games and negative outcomes, violent games remain a profitable industry staple. As consumers continue to express a desire for violent games, responsible video game creators have an interest in understanding how games can still be appealing but not harmful to consumers. A handful of studies have examined how the features of game characters, such as dress and skin color, influence players (Peña, Hancock, & Merola, 2009). This study is the first to examine how the gender of the target of violence in a game may influence players immediately thereafter.

It is important to consider how individual characteristics may interact with video game stimuli, as not all violent games are the same. The demographics of video game players have changed over recent years as the number of female players has increased (ESA, 2015; ESA 2016). Most video game research to date has focused on male players (Eastin & Griffith, 2006; Staude-Müller, Bliesener, & Luthman, 2008; Bösche, 2010); however, our findings suggest that female players may respond differently and more strongly to violent content, especially if it contains sexualized or otherwise gendered images of women.

In addition to highlighting the implications of gendered violence in games, this study demonstrates that implicit associations can be influenced by exposure to violent games. Researchers often interpret results of IAT paradigms as implicit attitudes (Greenwald et al., 2003). Implicit attitudes are thought to be more stable and resistant to priming effects, as they are controlled by automatic processes (Greenwald, McGhee, & Schwartz, 1998). Although

research has demonstrated that implicit attitudes are malleable, the observed effects are usually small (Blair & Banaji, 1996). This is the first study to demonstrate that playing a violent video game can alter implicit attitudes about gender, at least for female players.

Implicit attitudes, stereotypes, and biases influence every human interaction. Through a meta-analysis of gender stereotype malleability, researchers found that gender stereotypes can be temporarily weakened. While the short-term effects may be fleeting, it is believed that each exposure to a reduction strategy can weaken the weight of a stereotype (Lenton, Bruder, & Sedikides, 2009). Recently, many researchers have been interested in manipulating and reducing negative implicit biases, particularly those related to race. Negative racial implicit attitudes have been linked to violence in research and the media, especially in the case of White officers shooting unarmed Black men. There is a societal interest in reducing negative racial bias. Our findings suggest that this can be accomplished at least temporarily, albeit in a different domain. Implicit attitudes toward gender and race are thought to function similarly; therefore, it is reasonable to assume that the race of opponents in a violent video game may function similarly to gender in how it affects implicit attitudes. Although a single exposure to a video game will not permanently alter one's bias, there is reason to believe that each exposure can slightly weaken a stereotype (Blair, 2002). These findings may have potential to be employed in bias reduction programs.

5.1 Limitations

I was unable to demonstrate a relationship between gendered violence in video games and sensitivity to observed violence against women within a video vignette. I predicted that implicit gender attitudes would mediate the relationship between playing a violent game and identifying violent acts. While I was able to demonstrate that implicit attitudes can be influenced by violent

games, there may be reason to believe that implicit attitudes are not an appropriate predictor of explicit behavior. Research suggests that one's attitudes are often weakly related to their behavior (e.g., Ajzen & Fishbein, 1977).

The gender of the opponents in the game did not affect players' behavior in the video task, but perhaps I may have seen behavior change in a different scenario. The video used in this study depicted a white, heterosexual, college-age couple engaging in an argument which escalated to the man slapping the woman. The demographics of the couple could be manipulated, and the type of violence used could be varied. This study could be repeated with different scenarios to elicit behavior, and other behavior changes could be measured.

Ultimately exposure to an in-person violent scenario would be a better measure of participants' behavior. I could measure how participants react rather than how they believe they would react. Unfortunately, due to ethical and safety concerns, it is not feasible to stage an in-person violent scenario. Although imperfect, a video depiction of violence is currently one of the best ways to measure participants' reactions to violence against a woman.

Bias is another difficult concept to quantify. The IAT is a highly critiqued measure (Fiedler, Messner, & Buemke, 2006; Blanton, Jaccard, Gonzalez, & Christie, 2006; Blanton, Jaccard, Christie, & Gonzalez, 2006). Researchers have questioned the validity, reliability, and constructs used in the IAT. In a thorough critique of the measure, Fiedler, Messner, and Buemke (2006) question whether associations equal attitudes. A strong association score on the IAT may indicate a reflection of one's understanding of societal norms – not implicit bias. The researchers suggest that IAT scores may reflect “knowledge of a social conscious” rather than individual attitudes.

Using an IAT task, I found that men showed a slight preferential bias toward men and women showed a slight preferential bias toward women. The IAT has been criticized for measuring familiarity, not attitudes (Fiedler, Messner, & Buemke, 2006; Ashburn-Nardo, Voils, & Monteith, 2001). Even the IAT's creators have struggled with whether familiarity with a concept influences performance (Dasgupta, Greenwald, & Banaji, 2003; Dasgupta, McGhee, Greenwald, & Banaji, 2000). It is possible that men and women are showing a typical in-group bias (Turner, Brown, & Tajfel, 1979). Although familiarity and ingroup biases potentially confound IAT scores, this does not account for the experimental effects demonstrated in this study: women who played against female characters within the game evidenced a significantly more negative bias toward women than those who played against male characters.

In addition to issues with using implicit attitudes to predict behavior, participants may have misinterpreted the instructions for the video task: *“Please press the e key once for each aggressive act you see in the video. Please press the i key once at the point at which you would intervene in the violent situation.”* The video was only about 3 minutes long, yet some participants pressed “e” an excessive number of times (some nearly once every 2 seconds). Additionally, 75% of the participants pressed “i” multiple times and 80% pressed “e” again after pressing “i”. According to the instructions, participants should have only pressed “i” once and then not pressed “e” again because they would have already theoretically intervened. Using the number of times that a participant pressed “e” as a measure of their ability to identify aggressive cues may be a flawed interpretation because it seems that participants interpreted the task in a variety of ways.

Another limitation of the study design is the absence of a control condition. The lack of a control video game condition limits the conclusions that can be made about the effect of

opponents' gender. There was not a nonviolent video game condition because the short-term behavioral outcome differences between playing violent and nonviolent video games have been well established in the literature (Anderson & Bushman, 2001). However, the inclusion of a control video game condition in which the opponents in the game were genderless (i.e., animals, aliens) could serve as a strong baseline comparison for the effect of opponent gender.

We also know that all violent games are not created equal. The level of violence and the targets of violence vary. Video games can differ in the level of realism. Krcmar, Farrar, and McGloin (2011) found that individuals who played a more realistic game reported more presence in the game and displayed more aggression afterward. The video game utilized in the present study can be described as a fantasy game. Opponents in the game appeared human, but the setting and situations were entirely unreal. It is reasonable to expect that a game with a more realistic setting and violence would produce different effects.

Despite copious research, there is still debate about the effects of playing violent video games (Zendle, Cairns, & Kudenko, 2018). It has been well established that violent games can produce negative cognitive and behavioral effects (Anderson & Bushman, 2001; Anderson, et al., 2004; Carnagey, Anderson, & Bushman, 2007). As the body of research expands, we are beginning to understand which specific characteristics of violent games contribute to those observed outcomes.

5.2 Future Directions

Future studies should expand upon the notion that gendered violence in games can influence players outside of the game. I did not demonstrate a link between players' attitudes and behavior after game play, but there may be better ways to measure participants' reactions to violence in addition to those used in this study. Bystander intervention reaction time may be a

more realistic measure of sensitivity to violence (Bushman & Anderson, 2009). This study should be repeated and altered to include a measure of time to intervention during the video task. Rather than measuring how many aggressive cues participants are able to identify, we should measure how quickly they choose to intervene in the situation.

By asking participants to complete the implicit association test immediately after playing a violent game for 30 minutes, I was able to demonstrate a short-term effect on gender attitudes, but it is unclear how long the observed effect may persist. Future research should examine the possible long-term effects of playing violent games on gender attitudes. Additionally, future studies should consider players' previous exposure to violent games, which games they have played in the past, and frequency of game use. It is possible that a history of violent game play may reveal different effects than a short 30-minute snapshot, or this history might moderate the experimental effect.

The present study focused on gender attitudes, but implicit attitudes exist for several demographic characteristics including race, age, and religion. Future research should examine how other characteristics of characters in violent games influence players' attitudes.

5.3 Conclusion

Video games are one of the most popular and profitable entertainment industries. The violent nature of many games has led researchers to question whether playing violent games can desensitize players or cause them to act violently. While most games feature male characters as perpetrators and victims of violence, some games display violence against women. The purpose of this study was to determine if the gender of victims of violence in a video game could influence a player's attitudes towards women and possibly desensitize players to violence against women. I found that playing a violent game with female targets caused women to display more

negative implicit attitudes toward women. Our findings suggest gender violence in video games can have negative effects on a player's thoughts and attitudes. Video game consumers and creators should be aware of the possible effects that every facet of a game may produce. More research is necessary to understand the potential long-term consequences of gender violence in video games.

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