THE EFFECT OF VIDEO GAMES ON AGGRESSIVE BEHAVIOR IN UNDERGRADUATE STUDENTS

by

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ABSTRACT

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IN UNDERGRADUATE STUDENTS

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The study of the relationship between media and aggressive behavior gained popularity in the 1950's with television and has evolved to examine other media sources in the following decades. Video games have become the new media source of concern within the past decade (popularized in 2000), and as a result inspired the current study as an extension of the previous media studies. The current study examined the effect of video game play on aggressive behavior through survey research and consisted of 167 undergraduate participants at the University of Texas – Arlington. The analysis revealed that the personality and behavior of respondents did not exhibit an increase in aggressiveness as a result of video game play or content. The findings of this study are not consistent with a majority of the previous literature conducted on the topic that has indicated a relationship between video games and aggressive behavior

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CHAPTER 1

INTRODUCTION

1.1 Current Issue

Researchers have been intrigued by the possible relationship between media outlets and the effect on behavior for over half a century. Studies have evolved from a focus on television in the 1950's to video games in the 2000's. Previous studies have concluded that there is a relationship between media and aggressive behavior, but the present issue addresses whether studies on video games produce similar results (Andison, 1977; Carnagey & Anderson, 2005).

In addressing this issue, several factors are taken into account including the time spent playing video games, the type of game played (violent or non-violent), an individual's personality, and their history of aggressive behavior. Anderson and Bushman (2001), two major researchers in this field, developed the General Aggression Model (GAM) to explain these factors which has been supported by several laboratory experiments. The GAM suggests that short-term exposure to violent video games causes a temporary increase in aggression (Anderson & Bushman, 2001).

Studies regarding the relationship between video games and aggressive behavior are relatively recent, starting in the past decade, and therefore have not reached a concrete agreement on their effect. Although it has been commonly accepted that video games produce a short-term increase in levels of aggression, the long-term and lasting effects of video games are argued among researchers and require future longitudinal research.

1.2 Importance of the Issue

Video games are becoming a prominent source of media in today's society and studies should consider them as an evolution of the interest in the relationship between media and

aggressive behavior. Statistics reveal that more than ninety percent of children in the U.S. play video games and that the time spent playing video games has increased from four hours per week in the 1980's to over nine hours per week in the 2000's (Anderson, Gentile, & Buckley, 2005; Gentile & Walsh, 2002; as cited in Carnagey & Anderson, 2005). Despite these statistics being several years old, the increase in video game usage is concerning and is reason enough to study the effects of video games, especially considering that children are thought to be the most impressionable.

Additionally, the threat of video games increasing aggressive behavior has become a reality with cases such as the 1999 shooting at Columbine, attributed in part to the students playing DOOM, and Norway's shooter Anders Behring Breivik in 2011, who claimed that he "trained" on games such as World of Warcraft and Modern Warfare 2 (Moore & Manville, 2009; Peckham, 2012). With the popularity of video games in society and these real-life incidents, it is imperative to study the potential effects of video games on individuals.

1.3 Addressing the Issue

The current study examined the effect of video game usage, including play time and content, on aggressive behavior and personality in undergraduate students. The study utilized a survey method to ask students about their video game playing habits as well as their personality and behavioral issues. The results were analyzed in SPSS version 20.0 to evaluate whether or not the sample of undergraduate students at University of Texas – Arlington (UTA) supported the hypotheses regarding the relationship between video games and aggressive behavior, personality, and acts.

CHAPTER 2

LITERATURE REVIEW

The purpose of this section is to develop a background of information about previous studies regarding the effect of various media outlets on aggressive behavior. The studies selected for this literature review create a "timeline" of the study of media evolution. The section entitled "mass media" provides a general overview of research regarding all media types over several decades. The pioneer studies focus on the effect of television and began in the 1950's followed by film in the 1960's which both dominated the field of study for roughly 50 years and sparked a brief interest in comic books in the 2000's. The accumulation of research on various media outlets combined paved the way for the present studies, beginning in the early 2000's, of the effect of video games on aggressive behavior. Real-life events, such as Columbine and Breivik, contribute to the concern for public policy and point to the necessity for studies regarding the issue of video games and aggressive behavior.

2.1 Mass Media

Garofalo (1981) examined the trends in media research to stress the importance of criminologists joining sociologists and psychologists in the study of the media's role on behavior and crime. He suggested that criminologists should consider the influence of the media in theories of crime due to the pervasiveness of mass media and the criticism that media incites criminal and other antisocial behavior (Garofalo, 1981).

Due to differences in content, Garofalo (1981) evaluated both news and television exposure to individuals. According to Graber's research, a broad definition of crime and justice topics comprised roughly twenty five percent of Chicago newspaper content and roughly fifteen percent of local and network television news in the late 1950's (Graber, 1980:24, as cited in Garofalo, 1981). In general, violent and street crimes were overrepresented in the newspapers

(Antunes and Hurley, 1977; Graber, 1980:41; as cited in Garofalo, 1981). Television dramas have most often depicted crime as murder and offenders have usually been upper-class white males, which has contrasted with the young black male depicted in the newspapers (Barrile, 1980; Dominick, 1973; as cited in Garofalo, 1981). In contrast to newspapers reporting true events, television dramas have utilized crime and law enforcement scenarios to depict the conflict between good and evil rather than reality (Garofalo, 1981).

As a result of the prevalence of criminal activity in news and television media, it should be a concern to criminologists to analyze the effects of media content on individuals. Every form of media has been criticized for contributing to aggressive behavior in individuals and evidence has shown that frequent media exposure stimulates the learning and performance of aggressive acts (DeFleur, 1970:137; Goranson, 1969:409-410; as cited in Garofalo, 1981). Additional research has introduced three possible media effects on individuals which include imitation (learning of new behaviors), disinhibition (weakening of internal or external controls on aggressive behavior), and desensitization (weakening of emotional reactions to violence) (Garofalo, 1981). Studies conducted by Bandura and Belson reveal that individuals perform some of the violent behaviors viewed in the media and have a higher chance to exhibit violent behavior with increased exposure to media (Bandura, 1965; Belson, 1978, as cited in Garofalo, 1981). In addition to media increasing aggressive behavior, studies have revealed that media exposure shapes an individual's perception of criminals and victims, fear of crime, and desensitize individuals to violent acts (Hubbard, DeFleur, and DeFleur, 1975; Doob and Macdonald, 1979; Eysenck and Nias, 1978, as cited in Garofalo, 1981).

Garofalo (1981) suggests several areas of study that criminologists may examine for future research in formulating criminal theories. Most importantly, criminologists should conduct their own content analyses of media presentations about crime to address their own concerns which include messages regarding deterrence and rehabilitation, theories of crime causation, and the criminal justice process (Garofalo, 1981). Additionally, criminologists should study what

information regarding crime individuals absorb, perceived “reality” of media violence, differentiation between crime stories in the news, and the role of different media types on individuals (Garofalo, 1981). Essentially, thousands of studies have been conducted on the effect of media on aggressive behavior, but the criminology perspective is severely lacking and should be addressed in future studies.

2.2 Film

Berkowitz, Corwin, and Heironimus (1963) examined the debate about the influence of films on aggressive behavior with two studies to test the symbolic catharsis theory. According to the symbolic catharsis theory, hypothesized by Feshbach, “a symbolic expression of aggressive responses will weaken the instigation to subsequent aggression only if the aggressive drive has been aroused at the time of participation in the fantasy activity” (Berkowitz, Corwin & Heironimus, 1963, p.218). Berkowitz and Rawlings (1963) questioned this theory and provided their own theory which argued that “people seeing fantasy violence under conditions lowering their inhibitions against aggressive responses should display an increased likelihood of subsequent aggression” (Berkowitz et al., 1963, p. 220).

The first study was a laboratory experiment, which involved male and female college students, by subjecting the individuals to either an insulting or neutral treatment from a male experimenter. A female experimenter a provided brief summary of a movie to two groups, explaining the protagonist as either a “scoundrel” (justified aggression scene) or a “victim of unfortunate circumstances” (less justified aggression scene), before the students watched a brief clip of a film (Berkowitz et al., 1963).

The second study was a laboratory experiment that utilized the same concepts as the first study with a third group introduced. The insulted group received either a justified fantasy aggression synopsis or a less justified fantasy aggression synopsis of the film Champion while the neutral group viewed a clip on canal boats of England (Berkowitz et al., 1963).

The findings, consistent in both studies, showed that the angered students that watched the justified aggression scene exhibited higher hostility towards the experimenter than the students that viewed the less justified aggression scene (Berkowitz et al., 1963). The implications of the studies suggested that individuals may be more inclined to hurt the "bad guy" in their personal life after witnessing a film character "get what he deserved" (Berkowitz et al., 1963). Both studies seem to support the Berkowitz-Rawlings formulation and disagree with Feshbach's symbolic catharsis theory.

While the studies provide a beginning for a new hypothesis, there are still gaps and unanswered questions that future studies need to address. Berkowitz and Rawlings (1963) found that a violent scene that is considered justified is likely to arouse aggressive and hostile feelings in the viewer but there is a lack of explanation as to why this occurs (Berkowitz et al., 1963). The studies reveal that aggressive feelings are heightened but fail to show whether aggressive behavior was increased as a result of the films. Lastly, the significance of gender, of both the subject and the experimenter, should be taken into consideration. Ultimately, a better understanding of the relationship between media and aggressive behavior needs to be developed which can be achieved by studying other forms of media.

2.3 Comic Books

Kirsh and Olzak (2002) suggest that the exposure to violent themes found in comic books may aggressively bias an individual's social information processing (SIP) and contribute to heightened hostility and aggressive behavior. Due to the frame structure of comic books, the reader becomes an active participant and must fill in the story between frames contributing to the visualization of violence (McCloud, 1993).

Kirsh and Olzak (2002) discuss several advantages of studying the impact of media violence through the use of comic books, as compared to video games, which include: a lack of arousal associated with motor movements, less frustration in reading, lack of a "win or loss"

outcome, and the lack of popularity of comic books reduces the chance of prior exposure being a confounding variable.

The purpose of Kirsh and Olzak's (2002) study was to investigate the influence of comic books on SIP in relation to both overt and relational aggression. They hypothesized that individuals who scored high in trait hostility would provide the most negative responses after exposure to violent comic books (Kirsh & Olzak, 2002). The study consisted of 249 introductory psychology students who were divided into two groups: exposure to extremely violent comic books (EVCB), such as *Cremator*, and exposure to non-violent comic books (NVCB), such as *Archie* (Kirsh & Olzak, 2002). Following twenty minutes of reading the comic books, each participant was asked to fill out a questionnaire regarding their previous exposure to comic books, predisposition to anger, and the stories they had just read (Kirsh & Olzak, 2002).

Results of Kirsh and Olzak's (2002) study presented three main discoveries. It was found that males preferred EVCB whereas females preferred NVCB, but both males and females perceived the same levels of violence. There was consistency with findings that suggest overt aggression is characteristic of males and relational aggression is characteristic of females (Crick & Grotpeter, 1995, as cited in Kirsh & Olzak, 2002). The effect of SIP appears to depend on the type of conflict being studied as shown by individuals with high trait hostility provided aggressive responses to overt but not relational aggression (Kirsh & Olzak, 2002).

Conducting a study of the effect of violent comic books on aggressive behavior was beneficial in answering questions but questions for future studies also arose. Results showed that despite the same perception of violence, males and females react to violence differently and vary in the aggressive response (Kirsh & Olzak, 2002). Future studies should take the gender difference into consideration and attempt to find an explanation for the variance in gender responses. Comic books are an unpopular source of media, an advantage discussed earlier, but other forms of media are prominent and individuals are likely to be exposed regularly

to them. This raises the question of whether comic book studies are an isolated effect or can be compared to studies involving other forms of media such as television.

2.4 Television

Hartnagel, Teevan, and McIntyre (1975) examine the relationship between exposure to violence on television and violent behavior in a 1970 study. Prior research appears to be divided into two groups; Feshbach and Shramm have found there is little, if any, effect of violent television on an individual's behavior and Eron and Zajonc and Broadbeck have found there is an effect (Hartnagel, Teevan & McIntyre 1975). The study conducted by Hartnagel et al. (1975) attempted to resolve some of the inconsistent findings in previous studies by using a new research approach which included the participant's favorite show as the independent variable and adolescents as the participants.

The 1975 study conducted by Hartnagel et al. consisted of junior and senior high school students and addressed three hypotheses. The first hypothesis was that exposure to television violence is positively related to violence. The second hypothesis was that the respondents who perceive television programming as violent engage in more violent behavior than those that do not perceive television as violent. The third hypothesis stated that there would be interactions between the objective content of TV programming, the perception of this content, and various demographic and social characteristics of the participants. The hypotheses were tested by administering a questionnaire to each participant regarding their perceptions of their favorite show and general demographic information (Hartnagel et al., 1975).

The findings of the study were evaluated according to each hypothesis. The data revealed that there was only minimal support of the likelihood that violent television exposure is related to violent behavior with a Pearson correlation coefficient of 0.12. The data revealed that participants who perceived their favorite show as violent exhibited more violent behavior than participants that did not perceive their favorite show as violent. Lastly, the data revealed that

certain demographic and social characteristics were significant for violent behavior including low grades, family structure, and gender (Hartnagel et al., 1975).

Although there was a failure to support the hypothesis that there is a relationship between violent television and violent behavior, Hartnagel et al. (1975) showed the importance of taking demographic and social characteristics into consideration which is useful for control variables in future studies. It should also be noted that this study relied on the participant's favorite television program which may lead to a skewed representation of data in comparison to other laboratory studies which have used a predetermined or general television show.

Andison (1977) provides theories and historical trends by examining studies between 1956 and 1976 involving television violence and viewer aggression. Studies have found a high degree of violence present in almost all television programming (Gerbner, 1972; Carter and Strickland, 1975, as cited in Andison, 1977). Other studies have also reported that television is available in almost every American home and is viewed by all age groups (Arnold, 1969, as cited in Andison, 1977). For these reasons, the study of the relationship between television violence and viewer aggression has been of interest since the 1950's and it is crucial to find a definite answer due to the potential amount of individuals affected.

Andison's (1977) compilation of studies utilized a "data snowballing" collection method which produced 153 studies of which only 67 were useable in the analysis. The 67 studies involved over 30,000 participants therefore suggesting that the results would be representative of the population. Andison grouped the 67 studies into three schools of thought regarding the relationship between television violence and viewer aggression. The first school suggests that watching violence will have a cathartic effect on the aggressive levels of the viewers. The second school suggests that watching violent television neither stimulates nor retards the aggression of viewers. The third school suggests that television violence does stimulate aggression in viewers (Andison, 1977). Based on the three schools of thought, researchers appear to be divided on the effect of violent television on viewers.

Andison (1977) established several historical trends in the twenty year period that the studies were conducted. In regards to age, many authors tend to assume that children are more susceptible to the influence of television content than older age groups, but the data has shown that this is not necessarily the case and the adult age group may be more affected by violent content. In regards to the measure of aggression employed, data has shown that when degree of shocks are compared to overt physical aggression and questionnaire measures, the degree of shocks produce more positively skewed results. Lastly, there appears to be argument about whether a laboratory or field experiment method is more reliable and preferred as a result of laboratory experiments producing a higher positive relationship consistently (Andison, 1977).

The historical trends suggest that it is "reasonable to tentatively accept the TV violence as a stimulant to aggression theory" (Andison, 1977, p. 323). The trends provide insight into cautions that should be taken when studying results. This includes reviewing the results for a laboratory experiment due to the "removal from reality" that may heighten the effect of violent content on aggressive behavior (Andison, 1977). Additionally, most past studies have used young children as the subject so researchers should be cautious about applying conclusions to adolescents and adults without conducting a separate study for the specific age group (Andison, 1977).

Johnson, Cohen, Smailes, Kasen, & Brook (2002) examine a seventeen year longitudinal study conducted by Children in the Community that assessed the relationship between television viewing and aggressive behavior in individuals, a new approach on the topic. Previous studies have addressed the hypothesis that suggests violent television content contributes to aggressive behavior (Bandura, 1973, as cited in Johnson, Cohen, Smailes, Kasen, & Brook, 2002). Additionally, most prior studies have focused on experimental studies that have suggested a short-term aggression increase from violent television content, mostly in children (Bushman & Huesmann, 2001, as cited in Johnson et al., 2002).

The purpose of the Children in the Community study was to assess television viewing and aggressive behavior in individuals during adolescence and adulthood while taking environmental factors (ex. childhood neglect, low family income, and an unsafe neighborhood) into account (Johnson et al., 2002). Initially in 1983, youth and parent versions of the Diagnostic Interview Schedule for Children (DISC-I) were administered to assess aggressive behavior and psychiatric disorders (Costello, Edelbrock, Duncan & Kalas, 1984, as cited in Johnson et al., 2002). Following assessments utilized an age-appropriate version of the DISC-I. Additionally, the youth and parent were interviewed about the youth's television viewing habits (Johnson et al., 2002).

The findings of the study revealed that extensive television viewing by adolescents and young adults contributes to an increased likelihood of aggressive behavior. The environmental factors used as control variables were found to have only partial relevance to the relationship between television viewing and aggressive behavior (Johnson et al., 2002).

Since the inception of television in the 1940's, almost two thousand studies in addition to government commissions have addressed the issue of the "violent face of television" (Murray, 2008). Murray (2008) attempted to explain the positive effect of television violence on aggressive behavior, as found in previous studies, as a result of neurological changes in an individual. Theoretical foundations for this idea were based in Bandura's social-cognitive approach and Berkowitz's cognitive-neoassociation analysis which both suggest emotional arousal and the translation of communication "events" into thoughts and actions (Bandura, 1994; Berkowitz, 1984, as cited in Murray, 2008). Additionally, a National Research Council report from the Panel on the Understanding and Control of Violent Behavior found that "all human behavior, including aggression and violence, is the outcome of complex processes in the brain. Violent behaviors may result from relatively permanent conditions or from temporary states (National Research Council, 1993, as cited in Murray, 2008).

To examine the hypothesis influenced by this report and the work of Bandura and Berkowitz, Murray (2008) conducted a pilot study which focused on brain activities of children while they watched both violent and non-violent video program material. Based on the idea that humans would respond similarly to threats of actual physical violence and the neurobiological response to "entertainment" violence, Murray (2008) thought that the "threat recognition" system, that is the limbic system and right hemisphere of the brain, would be activated by viewing televised violence as a result of physiological and cortical arousal (Osborn & Endsley, 1971; Ekman & Davidson, 1993, 1994, as cited in Murray, 2008).

The findings of the pilot study found that violent and non-violent programs both activated regions involved with visual and auditory processing but only violent programs activated brain areas, including bilateral hippocampus and right amygdala, that are involved in arousal and attention, detection of threat, episodic memory encoding and retrieval, and motor programming (Murray, 2001; Murray et al., 2006; as cited in Murray, 2008). Essentially, the findings reveal that there is likely emotional processing of televised violence and storage of the threat event of televised violence (Murray, 2008).

The results provide both a promising starting point in the scientific community to understand how television violence leads to aggressive behavior as a result of neurological changes and a warning to society to be cautious of the price of entertainment, which recently has extended to the popularity of video games.

2.5 Video Games

The study of video games, gaining popularity in the early 2000's, has become an extension of the concern of the media's effect on aggressive behavior. Anderson and Bushman (2001 & 2002) developed the General Aggression Model (GAM) as an explanation for the role that content in video games has on individual's tendency for aggressive behavior, thoughts, and feelings (Anderson and Bushman, 2001 & 2002).

According to the General Aggression Model, aggressive behavior develops from scripts, derived from sources such as media, stored in a person's memory that are related to aggression or violence (Anderson & Bushman, 2002). The hostile attribution bias suggests that aggressive people are likely to interpret ambiguous social events in a relatively hostile way (Anderson & Bushman, 2001). Essentially, the GAM is the most referenced model in the field of video game research because it introduces the idea that exposure to violent video games leads to short-term increased levels of aggression as a result of a learning process for scripts. As a result, an aggressive personality will develop with prolonged exposure and ultimately lead to more delinquent acts (Anderson & Bushman, 2002).

Anderson and Bushman (2001) conducted a meta-analytic review of thirty five studies prior to 2000 to gather information on previous research findings regarding the link between video games and aggressive behaviors. They referenced their General Aggression Model to formulate two questions for evaluating the previous studies which were "is exposure to violent video games associated with increases in aggression?" and how can exposure to violent video games increase aggression?" (Anderson & Bushman, 2001, p. 356) The hypothesis formulated around these two questions was that playing video games would pose a potential risk in heightened aggression among youths.

The results of the meta-analysis revealed that short-term exposure to violent video games causes a temporary increase in aggression and a decrease in prosocial behavior which ultimately support the initial hypothesis (Anderson & Bushman, 2001). Following these results, Anderson and Bushman (2001) raise several issues that are in need of future research. Firstly, longitudinal studies are needed to evaluate if video game exposure will produce similar effects on aggression from prolonged exposure as short-term exposure has proven to show in studies. Secondly, to obtain a better understanding of how the violence in video games creates heightened aggression and the magnitude of effect that media violence has on individuals. Lastly, it is suggested that the objective and marketing of video games could be re-evaluated to

establish a positive message to society rather than a message of violence (Anderson & Bushman, 2001).

Based on the General Aggression Model, a study conducted by Anderson and Bushman (2002) tested the hypothesis that brief exposure to media violence can temporarily create a hostile expectation bias (Anderson & Bushman, 2002). The study consisted of 224 participants, 112 men and 112 women, which were randomly assigned to two groups to play either a violent or non-violent video game for twenty minutes then tasked with completing three ambiguous story stems by answering the question "what happens next?" for the character in each story (Anderson & Bushman, 2002).

The results revealed that participants randomly assigned to the violent video games expected more aggressive behaviors or feelings in the story than participants randomly assigned to non-violent video games. With a playtime of only twenty minutes, the results seem to support the hypothesis that brief media exposure can create a temporary hostile expectation bias and short-term aggression (Anderson & Bushman, 2002). Ultimately, Anderson and Bushman (2002) accept their hypothesis regarding short-term effects, but suggest that aggressive feelings and behaviors can be controlled by limiting exposure to video games in children before aggressive scripts lead to long-term effects in children (Anderson & Bushman, 2002).

Carnagey and Anderson (2005) conducted three experimental studies to test the GAM in terms of the role reward and punishments found in video games have on aggressive behavior in individuals. The research question "do video games that reward violent actions increase aggression-related variables compared with similar games that punish violent actions or that are nonviolent?" sparked a new direction for the research of the effect of video games on aggression (Carnagey & Anderson, 2005, p. 882). According to the GAM, reward for violence in a video game should increase aggression outside the video game and contribute to positive attitudes about violence. In contrast, punishment for violence in video games should decrease

aggressive acts, but may increase frustration (Carnagey & Anderson, 2005). The GAM outlines three possible routes of video game influence on aggressive behavior including cognitions, affect, and arousal which led the researchers to control for arousal in their study to determine the effects on aggressive cognition, affect, and behavior (Carnagey & Anderson, 2005).

These studies consisted of undergraduate participants and had three primary purposes: to examine the effects of reward and punishment on aggression, to evaluate if violent-game-induced changes in affect or cognition contributed to increased aggressive behavior, and to test the competition hypothesis by using a non-violent competitive video game to control for arousal (Carnagey & Anderson, 2005). To study these three goals, the participants were divided into three random groups to play a different version of Carmaggedon. The first group played a version in which killing pedestrians was rewarded, the second group played a version in which killing pedestrians was punished, and the third group played a non-violent version in which killing pedestrians was not a possibility (Carnagey & Anderson, 2005).

Results revealed that regardless of rewards or punishments present in a video game, the violence present in video games may lead to an increase in a hostile effect. Therefore, it is thought that reward for violence in a video game will produce a higher aggressive cognition and behavior in an individual than a video game that punishes violence. Additionally, the participants reported an increase in physical aggression following the exposure to violent video games, thus supporting the hypothesis that violent games, as a result of both direct and indirect rewards, increase aggression in real-life situations (Carnagey & Anderson, 2005).

Bartholow, Sestir, & Davis (2005) conducted a correlational study and a laboratory experiment to examine the effect of video game violence exposure (VVE) and behavior while controlling for personality. The two studies were designed to test an aspect of the General Aggression Model which proposed that repeated exposure to violent video games produces cognitive changes, including desensitization, which contributes to a change in behavior over a period of time (Bartholow, Sestir, & Davis, 2005).

It was hypothesized in the first study that “prior exposure to video game violence would be positively correlated with self-reported aggressive tendencies and with scores on basic dimensions of personality consistent with aggressiveness and antisociality” (Bartholow et al, 2005, p. 1574). Additionally, the researchers predicted that differences in trait hostility would account for the association between VVE and aggressive tendencies. The study consisted of two hundred male undergraduates from introductory psychology courses. The participants were given a packet of randomized questions intended to measure VVE, aggressive behavior, trait hostility, basic personality, and empathy. The findings were consistent with the hypotheses and results revealed that VVE was positively correlated with both physical and verbal aggression as well as trait hostility. Additionally, results showed that increased hostility provides one pathway through which exposure to video game violence influences aggression. Further, there was slight evidence for a third variable, empathy, contributing to the link between VVE and aggression. These findings support the aspect of the GAM regarding desensitization (Bartholow et al, 2005).

The primary purpose of the second study was to address the effects of VVE and content on aggression in a laboratory setting. According to the first hypothesis, individuals with high prior exposure should exhibit higher aggressiveness than individuals with low prior exposure only in violent game conditions. According to the second hypothesis, high prior exposure should be associated with higher aggressive tendencies regardless of the video game condition. The researchers controlled for aspects of the game-playing experience that might influence frustration including performance levels and postgame frustration. The study consisted of a subset of 92 participants from the first study and they played either a violent or non-violent game with the perception that they were competing against one another, as explained by the experimenter. The findings revealed that participants who were chronically exposed to high levels of video game violence exhibited aggressive tendencies regardless of the video game content which was consistent with Hypothesis 2. Additionally, similar to the first study, hostility

levels partially accounted for this effect which supports prior research and the hostile perception bias as described by the GAM (Bartholow et al, 2005).

Implications of the two studies supported the GAM which predicted that repeated exposure to violent video games leads to increases in aggressive and antisocial traits. Additionally, the studies supported the desensitization prediction of the GAM with results that showed reduced empathy and increased hostility in individuals exposed to video game violence. The researchers are careful to point out that, despite these implications, there were limitations in their measures and that future studies should examine other presumed third variables and mediators that may have an effect on the link between video game exposure and aggressive tendencies. Ultimately, there is still a lot of research that needs to be conducted in this area to better understand both short-term and long-term effects of video game exposure (Bartholow et al, 2005).

Shibuya, Sakamoto, Ihori, & Yukawa (2008) conducted the first study to assess the long-term effects of violent video games based on a content analysis. The study was designed to examine an aspect of the GAM which predicts that violent video games directly prime aggressive thoughts and stimulate long-term development of aggressive knowledge structures, which are rehearsed by repeated exposure to violent media (Anderson & Bushman, 2002; as cited in Shibuya, Sakamoto, Ihori & Yukawa, 2008). Three research questions were posed by the study including: “Is playing video games where violence is present positively correlated with later aggression and negatively correlated with the later antiviolence norm?”, “Which contexts of video game violence increase later aggression?”, and “Which contexts of video game violence decrease later aggression?” (Shibuya et al, 2008, p. 530). The researchers controlled for earlier aggression in the first survey administered which allowed for them to directly test the plausibility of long-term causal effects of violent video games on aggression.

Shibuya et al (2008) conducted two studies, a year apart, consisting of 591 students to assess the link between violent video games and aggressive behavior. The two surveys asked

the children to list their three favorite video games that they play most frequently in a month. The analysis consisted of the presence and contexts of violent scenes of 40 video games and the average scores for presence of violence and 21 contextual variables of video game violence were calculated for each child.

The findings were separated by the three research questions which examined the effect of presence of violence, contextual variables that increase aggression, and contextual variables that decrease aggression. Some of the findings were different than what was initially expected.

The results for the first research question revealed that playing violent video games increases hostility for boys, but not for girls, as expected. The researchers contributed this to the fact that girls are less likely to be exposed to violent video game content but regression analysis indicated that girls are more likely to perceive violent scenes critically and exposure to particular contexts of violent scenes is likely to make girls less aggressive.

The results for the second research question revealed the variables that are likely to increase aggression including graphicness, reality, and rewards. Additionally, unjustified violence and depicted pain as a consequence of violence is likely to increase physical aggression in boys.

The results for the third research question provided the most surprising findings. Three variables – extent of violence, role-playing, and humor were found to likely decrease aggression. Extent of violence is likely to decrease violence for girls and can be perceived as socially unacceptable. Role-playing, thought to increase aggression, may actually decrease aggression due to learning cooperation with others. Lastly, humor is likely to build the antiviolence norm for boys and girls by aiding children in identifying video game violence as unrealistic (Shibuya et al, 2008).

The study had several limitations which included the lack of measuring how children interpret violence in video games, being the first study to assess long-term contextual effects, and the study's reliance on content analysis which does not take into account other variables,

such as parental mediation or prosocial behavior, that may have influenced the children. Despite these limitations, the study is important for the area of video game research in terms of building the foundation for future studies involving the long-term effects of video games (Shibuya et al, 2008).

Ferguson, Rueda, Cruz, Ferguson, Fritz, & Smith (2008) conducted two studies to examine the relationship between exposure to violent video games in a laboratory setting and in real life. Researchers discussed previously have relied on aspects of the GAM as a basis for their studies. Ferguson et al (2008) make reference to the GAM but also introduce a new model known as "the catalyst model" as a result of taking genetic and biological factors into consideration for aggressive tendencies. The catalyst model suggests that the "development of a violence-prone personality occurs through a largely biological pathway in which genetic predisposition leads directly to an aggressive child temperament and aggressive adult personality" (Ferguson, Rueda, Cruz, Ferguson, Fritz & Smith, 2008, p. 314). Essentially, environmental strains may act as catalysts for individuals prone to aggressive acts and violent video games may act as a stylistic catalyst which provides a model of violence for the individual prone to aggressive acts (Ferguson et al, 2008).

The first study focused on aggression in a laboratory setting consisting of 101 undergraduate student volunteers who were divided into three groups: playing a violent game, playing a non-violent game, or reading a summary of each game then choosing which game to play. Two hypotheses were tested in the study to help examine which theoretical model was best supported by the correlational data on video game exposure. Hypothesis 1 predicted that exposure to video game violence in a controlled environment results in increased aggression on a subsequent laboratory measure of aggression. Hypothesis 2 predicted that individuals who are exposed to more violent video games in real life are more aggressive on a laboratory measure of aggression. In addition to playing the assigned game for 45 minutes, the participants also completed questionnaires regarding demographics, trait aggression, video

game habits, and aggressive behavior. The results revealed that there was not a significant difference in short-term aggression or long-term exposure between the violent and non-violent group so there was a failure to support Hypothesis 1. These findings support the catalyst model but not the GAM. Additionally, findings showed that males were more aggressive than females but there was no evidence suggesting that individuals who prefer violent video games are innately more aggressive. Essentially, aside from gender, there does not appear to be a relationship between violent video games and aggression (Ferguson et al, 2008).

The second study was designed to examine whether violent video game exposure retained predictive value regarding violent crime with three control variables: family violence exposure, trait aggression, and gender. The study included 428 undergraduates who answered questionnaires regarding demographics, trait aggression, video game habits, family violence exposure, and violent criminal behavior. The analysis was intended to determine whether the GAM or catalyst theoretical model was a better fit to explain the data. The results suggested that interaction between aggressive personality and violent video game exposure is predictive of violent crime but there was not a direct route between video game exposure and violent crime. This suggests that aggressive individuals may seek out examples of violence, such as those found in video games. Additionally, exposure to family violence was a predictor of trait aggression and violent criminal acts. These results are more supportive of the catalyst model's prediction that violent behavior is directly fueled by trait aggression and video games are a stylistic catalyst (Ferguson et al, 2008).

The two studies showed more support for the catalyst model and questioned the effectiveness of the GAM as a predictive model for aggression. The catalyst model considers more variables in the relationship between video game violence and aggressive behavior in comparison to the direct route between video game violence and aggression that the GAM predicts in individuals (Ferguson et al, 2008).

Kutner, Olson, Warner, & Hertzog (2008) approached the topic of videos by a different method of conducting focus groups with 21 adolescents and 21 of their parents or guardians to discuss their perceptions and concerns about video game habits and content. The goal of the study was to gather more information on parent perspectives of video game content and usage and the influence of their perspectives on children. Four research questions were constructed to address this goal which included parents' concerns about their sons' use of video games, the sons' perspectives of their parents' view of video games, and reasons for playing video games and their effects on the sons' behavior and life (Kutner, Olson, Warner, & Hertzog (2008).

For the current study, the researchers held eight focus groups, four with the boys and four with their parents or guardians, to discuss adolescent video game play. The boys were asked several questions including their reasons for liking a certain game, their opinion of whether games can have an influence on behavior, and how their parents view video games. The parents were asked several questions including their concerns about video game play for both non-violent and violent games as well as why they think their sons play video games (Kutner et al, 2008).

Following the discussion in each focus group, the moderators discussed themes in responses and made note of unanticipated findings. There was a general consensus between parents about their opinions and concerns of video game usage by the sons. Parents were also concerned about violent content that their sons may be exposed to by playing video games but the degree of concern varied based on the context of violence, realism of the game, and the target of the violence. The results of the sons' study group revealed that sons possess many of the same concerns that their parents expressed in their study group. For example, many of the boys thought that younger children should be protected from violent content which is consistent with parental concerns for children's exposure to violent content. Surprisingly, both parents and sons saw potential for positive effects of video games, both non-violent and violent, despite their concerns for video game usage. Most importantly, the results of this study revealed that young

children are receptive to their parents' concerns and parents can influence their children's values. Parental involvement may be a positive influence but future studies would be needed to determine the role of parents in the relationship of violent video game content and aggressive behavior (Kutner et al, 2008).

Olson, Kutner, & Warner (2008) conducted focus groups consisting of 42 boys between the ages of 12 to 14 to understand the role of violent video game play in adolescents' from their own perspective. The study addressed three main issues: the reason boys play violent video games, the boys' view of the role of video games in social relationships, and the influence of violent video games on behavior and thoughts according to the boys. Young adolescents were chosen as the focus of the study because they are more likely to engage in risky behavior and not asses consequences, thought to be more vulnerable to the influence of violent media content, and policies to restrict access to violent video games are aimed at adolescents (Olson, Kutner, & Warner, 2008).

The present study consisted of two sets of focus groups: concurrent groups of 21 parents and sons, and a boys-only group of 21 participants. The boys were interviewed about a video game screenshot that was chosen from a selection of eight with questions regarding their reasons for liking the game, violent content in video games, and whether they played games alone or with their friends. The responses were reviewed through print transcripts and audio recordings to discover common themes. The results were then analyzed to gain an understanding on a topic that has not been fully explored (Olson et al, 2008).

The researchers note that the results of this study provide insight into young adolescents' attitudes and behaviors regarding video games. The boys were attracted to video games for five main reasons which included fantasies of power, challenge, emotional regulation, sociability, and learning new skills. Despite this appeal, many of the participants were aware that game consequences do not necessarily correlate to real-life consequences for violent actions. In contrast to previous studies, the results of the study revealed both positive and

negative effects of video games on adolescents. The boys felt that violent content could increase understanding of real-world consequences for actions and that the influence of the game depended on the cognitive maturity of the individual. There was a slight concern for the exposure to violent content for younger siblings or other adolescents, but not for the participant himself. Ultimately, the researchers suggest that this study should not be generalized for the adolescent population but rather it is a starting point for future studies on video game effects on adolescents (Olson et al, 2008).

Barlett, Anderson, & Swing (2008) reviewed the literature to discuss the suspected and confirmed effects of both violent and non-violent video game exposure on positive and negative influences in players. Debate has been prevalent in the field of study whether playing violent video games will increase an individual's aggressive behavior and while many studies provide evidence for this relationship, there have also been studies conducted that suggest a positive influence from video game play (Barlett, Anderson, & Swing, 2008).

Several theoretical models have been developed to explain the effects of video games, most notably being the General Aggression Model which was a precursor for the General Learning Model (GLM). The GLM is a theoretical model that can explain both positive and negative effects of video game play. The model "describes how person and situational variables interact to either increase or inhibit various types of learning" (Buckley & Anderson, 2006, as cited in Barlett et al, 2008, p. 379). The process involves three internal states including physiological arousal, feelings, and cognitions which relate to learning-based changes and scripts that can influence an individual's behavior (Barlett et al, 2008). The theoretical models discussed have been utilized by researchers to develop hypotheses to test the effects of video games in real-life and laboratory experiments.

The authors defined positive effects of video games as the effects that are beneficial to the individual and society. This includes improved cognitive outcomes and increased social skills such as teamwork. The evidence for positive effects is limited, but can be found in non-

violent games that are intended for educational use. These types of games, such as Brain Age and Tetris, are designed to enhance learning, vocabulary, and spatial abilities. Suspected positive outcomes from video games include increased hand-eye coordination and sharpened reaction times. Ultimately, the research on positive outcomes is not as extensive as research on negative outcomes of video games (Barlett et al, 2008).

The authors defined negative effects of video games as the effects that are harmful either to the individual or society. This includes aggressive acts and negative social skills such as a decreased ability in school or a job. The majority of studies have related to the relationship between video games and the negative effects on players. These studies have found evidence to support the hypothesis that exposure to violent video games is related to aggressive behavior, feelings, and thoughts. Suspected negative outcomes from video game play include desensitization, a decrease in empathy, attention deficits, and a decrease in school performance (Carnagey, Anderson, & Bushman, 2007; Chan & Rabinowitz, 2006; Anderson et al, 2007, as cited in Barlett et al, 2008). Long-term negative effects from exposure to violent video games still need to be studied more extensively to contribute to the understanding of the potential relationship as theorized by the GAM (Barlett et al, 2008).

Przybylski, Ryan, & Rigby (2009) evaluated several studies that explored the relationship between violent video game content and an individual's motivation to play games using the self-determination theory. Unlike the abundance of studies on the role of violent content on the player, the studies on the role of violent content in motivation and attraction are limited. The self-determination theory (SDT) is concerned with an individual's psychological needs and the motivation behind choices that individuals make without external interference. From this theory, the researchers developed a hypothesis related to video games which stated that violent content adds little to motivation for a typical player once need satisfactions, such as competence and autonomy, have been considered. Essentially, individuals play video games as

a result of intrinsic motivation and because the activity is enjoyable (Przybylski, Ryan, & Rigby (2009).

The first study consisted of 68 undergraduates that participated in a laboratory experiment to play a violent video game for 15 minutes. The hypothesis predicted that players' experience of competence and autonomy during play will significantly account for their enjoyment and preference for future play. Additionally, it was predicted that differences in trait aggression would greater account for variance in preference for future play than differences in need satisfaction. The participants were assessed preplay and postplay for variables including trait aggression, enjoyment of play, preference for future play, and measures of competence. The results of the study revealed that autonomy and competence, basic needs satisfactions, were related to enjoyment and preference as hypothesized. Trait aggression was found to influence future preference for playing video games, but not a greater enjoyment of the game (Przybylski et al, 2009).

The second study consisted of 1,642 participants from an online community that were asked to respond to a survey about their favorite video game. The survey was designed to test the role dispositional aggression has in accounting for game outcomes and value for future play. Similar to the previous study, it was predicted that needs satisfactions would account for variance in game enjoyment and future play. It was also predicted that the Entertainment Software Rating Board (ESRB) rating and the researchers' own rating of violent content would interact with trait aggression by influencing a player's appraisal of the video game but not their enjoyment. The measures for the survey included competence, autonomy, enjoyment, and trait aggression. The results of the survey revealed that once needs satisfactions were controlled for, violent content did not act as a motivating role for video game play or enjoyment and trait aggression was likely to increase the preference for violent games. These results are consistent with the findings of the previous study. Overall, the findings of both studies supported the principles of the self-determination theory by revealing that video games are enjoyable and

motivating because they provide opportunities for psychological need satisfaction and violent content was shown to have little effect on the reason for playing video games (Przybylski et al, 2009).

Ferguson, Olson, Kutner, & Warner (2010) address the debate of the effect of violent video game exposure on aggressive behavior by conducting a study of 1,254 seventh and eighth-grade students. The researchers reflect on the controversy of the suggested link between video games and aggressive behavior by highlighting several concerns previous studies have addressed including poor validity of aggression measures, a third variable effect, citation and publication bias, and small effect sizes. Overall, it is difficult to study and assess the relationship between video games and aggressive behavior which is reflected in the mixed results of previous studies (Ferguson, Olson, Kutner, & Warner, 2010).

The study focused on the effect of violent video game exposure on delinquent behavior, including bullying, and was designed to address gaps in the literature by directly focusing on behaviors of legal and social interest behaviors and being multivariate in nature There were two main hypotheses in the study: “any relationship between video game playing and delinquency will be moderated by other relevant third variables” and “any relationship between video game playing and bullying behavior will be moderated by other relevant third variables” (Ferguson et al, 2010, p. 6). The 1,254 participants completed a survey that included measures of trait aggression, parental involvement, delinquency, bullying, and aggression when angry (Ferguson et al, 2010).

Out of 1,254 participants, 1,016 had at least some exposure to violent content in video games. Boys reported a higher exposure to violent video games than girls (67.9% to 29.2%) which supported the prediction that gender is a predictor for preference in video game content along with aggressive personality traits. The results found that only trait aggression and stress were predictive of delinquent behaviors and once these variables were controlled, the influence of violent video games on delinquent behavior was null which supported the first hypothesis.

Trait aggression and stress also best predicted bullying behaviors and once controlled for, the second hypothesis was supported. The results of this study did not support the findings of previous studies that violent video game exposure increases aggressive behavior and found little evidence to support the public policy concerns for adolescents. The researchers provided several suggestions for future studies on video games including using more consistent standards for the interpretation of effect sizes, using multivariate analyses, and distinguishing normal aggression from pathological aggression. Overall, this study contributes to the mixed results of video game studies and thus future studies are still necessary to aid in shaping public policy (Ferguson et al, 2010).

Rothmund, Gollwitzer, & Klimmt (2011) investigated the negative effects of violent video games on the trust and cooperation of players. Previous studies have found that violent game exposure enhances hostile information processing which can lead to perception bias and increased aggression but the effect on prosocial behavior has been unaddressed (Kirsh & Mounts, 2007; Bushman & Anderson, 2002; as cited in Rothmund, Gollwitzer, & Klimmt, 2011). Gollwitzer and Rothmund (2009) introduced the SeMI model which predicts a "synergistic interaction between a personality disposition and situational cues." This interaction may trigger a suspicious mindset including enhanced hostile information processing and a decrease in prosocial and cooperative behaviors. As a result of this model, the researchers conducted a study and proposed that exposure to aggressive non-player characters (NPCs) in video games can decrease prosocial and cooperative behaviors (Rothmund et al, 2011, p. 108).

The study utilized 100 male undergraduate students that participated in one of two randomly assigned experimental conditions that consisted of playing or watching a manipulated game sequence. Three main hypotheses were tested in the study: exposure to aggressive NPCs decreases cooperation in a subsequent social dilemma situation, cooperation is reduced more strongly if NPC aggression against an avatar is experienced from a victim's perspective, and the effect of exposure to virtual aggression on subsequent cooperative behavior is

mediated by the activation of a suspicious mindset (Rothmund et al, 2011). To test the hypotheses, the researchers manipulated the amount of aggressive NPC behavior in a video game sequence and the participants watched or played a game sequence then entered a social dilemma situation which was either a lottery game or a common goods pool in which they could display more or less cooperative behavior (Rothmund et al, 2011).

The results revealed that virtual aggression can decrease players' cooperative behavior when the video game is played, but not observed. Additionally, the players who participated in the sequence with highly aggressive NPCs invested less money in the social dilemma situations than the less aggressive NPC group which displays a lack of trust. These results support the initial hypotheses and the SeMI, model but there were several limitations including the inability to measure a participant's perceived mistrust and cooperation of other participants due to the possibility it would skew the results. Overall, this study suggests that exposure to violent video games can have negative effects on prosocial behavior, such as trust and cooperation, in addition to an increase in aggressive behavior as found in previous studies (Rothmund et al, 2011).

Greitemeyer & McLatchie (2011) attempt to explain the role of denying humanness to individuals in the realm of video game play. Dehumanization has been defined as "a process in which people disengage their moral self-sanctions, thereby relieving themselves of feelings of guilt over their aggressive actions" (Bandura, 2002, as cited in Greitemeyer & MCLatchie, 2011, p. 659). Dehumanization is thought to be a trigger for aggressive behavior because the process enables and disinhibits violent acts and occurs in both intergroup and interpersonal contexts (Haslam, 2006; Leyens et al, 2001; as cited in Greitemeyer & McLatchie, 2011). Previous studies have supported a relationship between video games and aggression and the present studies examine a hypothesized mechanism that triggers this relationship: perceiving the victim to be less human (Anderson et al, 2008; Bushman & Huesmann, 2006; as cited in Greitemeyer & McLatchie, 2011).

The first study was a laboratory experiment that involved 60 students from the University of Sussex who were randomly assigned to one of three video game conditions: violent (Lamers), neutral (Tetris), or prosocial (Lemmings). Greitemeyer & McLatchie (2011) hypothesized that playing a violent video game would increase dehumanization and playing a prosocial video game would diminish dehumanization as opposed to the effects of a neutral video game on humanization. The participants played their randomly assigned game for 15 minutes and then responded to the Ten-Item Personality Inventory to measure dehumanization from which a score was computed for the in-group (Britons) and out-group (immigrants). The participants did not indicate suspicion for the relationship between playing a video game and the dehumanization measure. The results revealed that violent video game play, but not prosocial game play, was associated with the perception that the out-group possessed fewer human than nonhuman attributes compared to the in-group. Therefore, the first hypothesis was supported but the second hypothesis was not supported by these findings (Greitemeyer & McLatchie, 2011).

The second study was a laboratory experiment that involved 40 students from the University of Sussex who were randomly assigned to one of two video game conditions: violent (first-person shooter game) or neutral (3-D Pinball). Based on the findings from the first study that violent video games are associated with dehumanization, the researchers hypothesized that an increased denial of humanness to other people was related to increased aggressive behavior after playing video games. The participants completed a survey regarding their attitudes about the British National Party prior to playing a video game for 15 minutes. The participants were led to believe that their essays were evaluated with negative comments by another participant, but in actuality it was the experimenter. Following this evaluation, the participants responded to two measures of dehumanization and measures of aggressive behavior. The results revealed that participants that played the violent video game expressed more negative human-uniqueness and human-nature qualities. Additionally, the participants

who played the violent video game judged the other imaginary participant in a less positive manner than the participants who played the neutral video game. The findings contributed to the results from the first study and also supported the hypothesis of the second study that the denial of humanness to other people seemed to account for the effect of playing a violent video game on aggressive behavior. Overall, the role of dehumanization is supplementary to previous literature that suggests that the type of video game and existing knowledge structures contribute to the effect of video games on aggressive behavior (Anderson & Dill; as cited in Greitemeyer & McLatchie, 2011).

2.6 Real-Life Cases

While media studies have shown that violent video games can increase aggressive behavior, they do not possess the same magnitude of effect on public policy and societal concerns as real-life situations. The Columbine shooting of 1999 and the mass shooting by Norway's Breivik of 2011 are two examples of real-life cases that suggest the effect of violent video games on aggressive behavior is not just a laboratory effect, but rather it may influence actual events.

The incident at Columbine High School occurred on April 20, 1999 and involved two high school seniors, Dylan Harris and Eric Klebold, who embarked on a mass shooting that resulted in the death of 13 people and 21 people injured. This incident brought concern to the influence of video games on youth. Harris and Klebold enjoyed playing video games and were actively involved in developing levels for DOOM, a first person shooter game. According to Jared Block, a psychiatrist and researcher, the young men played video games as a cathartic release for their anger and rage and the trouble began when the parents denied them their video game privileges. Under this assumption, the mass shooting at Columbine was a result of redirected anger from Harris and Klebold who were unable to find solace in video games which provides support for Feshbach's symbolic catharsis hypothesis. The lack of remorse and guilt in the young men may be contributed to the effect of desensitization brought on by exposure to

violent video games. While the link between video games and the Columbine shooting is speculative, there is still the lingering concern that violent video games contribute to increased aggressive behavior in youth (Nizza, 2007).

In July of 2011, two tragedies occurred in Europe: 8 deaths as a result of a car-bomb near a government building in Oslo, Norway and 69 deaths as a result of a mass shooting at a youth camp run by Norway's Labor Party. Both incidents were committed by Anders Behring Breivik, a 33 year old Norwegian. The trial following the tragedies has sparked a debate about the effect of video games on aggressive behavior due to the description of Breivik that he was obsessed with games such as World of Warcraft and Modern Warfare 2. Breivik wrote a 1,500 page manifesto titled "2083: A European Declaration of Independence" in which he claimed that he used video games, specifically Modern Warfare 2, to train for combat operations and that stereotypes of video games justify his social isolation. These claims by Breivik have been scrutinized in his trial, but the idea that video games contributed to his actions still remains (Peckham, 2012).

Ultimately, the effect of violent video games on aggressive behavior is controversial and neither Breivik nor Columbine solidify evidence for either side of the debate. Rather, the two incidents contribute to the concern for public policy and society that has been addressed in research. While video games may not have been the sole contributing factor in the shootings, the possibility that it had some influence on the individual should be reason enough to focus studies on the topic in order to develop policies that protect society.

2.7 Conclusion

The research regarding media and its effect on aggressive behavior has evolved over the past 60 years, from television to video games. Although the media outlet may have changed, the results have remained consistent in showing that there is some significance in the hypothesized relationship between violent media exposure and increased aggressive behavior with several studies refuting this hypothesis. Video game studies seek to explain the proposed

relationship more in-depth by exploring both short-term and long-term effects on aggression along with controlling for potential third variables such as family history. In addition to studies focusing on aggressive behavior, several studies have explored other areas in which video games may influence including goals, motivation, and dehumanization, which contribute to the assumption that video game exposure has negative effects for players. The incidents that occurred at Columbine and Norway reinforce the findings of studies which suggest that video games are a societal concern and restrictions or policies should be implemented to control for the influence video games have on individuals. Overall, video game studies have increased understanding of the relationship of violent media on aggressive behavior, but gaps in the literature still exist such as the full extent of long-term effects and most importantly, why the change in behavior occurs as a result of video game exposure.

CHAPTER 3

METHODOLOGY

The primary purpose for conducting this study is to evaluate the influence of exposure to video games on an individual's behavior, specifically aggression. Various aspects of video game play were explored including the amount of time played and the content of games to achieve this purpose.

3.1 Sample Selection

The literature review covers numerous studies that involve various age groups, including both adolescents and college students, to examine the effect of video games on aggressive behavior in the participants. For the purpose of this thesis, the effect of video games is of interest in college-aged students. Therefore, the unit of analysis is the individual - male and female students. The target population for the sample is individuals classified as an undergraduate student at the University of Texas at Arlington.

The study was conducted at the University of Texas at Arlington (UTA) during the Fall 2012 semester. The study was cross-sectional and involved a convenience method of sampling. The data for the study was collected through self-administered surveys. Along with the surveys, the participants received an informed consent form which was instructed to be read prior to the completion of the survey (see Appendix A for full copy of the consent form). The consent form provided students with information about the study as well as noting participation was voluntary and responses would be anonymous and confidential. It was also stressed that there was an age requirement of 18 years of age or older to participate. A signature for the form was not required, but consent was implied if the student filled out the survey.

Classes that surveys were administered in were chosen through convenience with a consideration for a representative sample. Permission from the professors was received prior to

the administration of surveys to students. Four classes were selected within the Criminology and Criminal Justice department which included two lower level and two upper level classes. In addition to the class level, consideration was also taken into account for the time of day the class was scheduled resulting in two morning classes, one afternoon, and one night class. This was in an attempt to provide a representative sample of the target population and ensure a group of students would not be excluded due to classification (lower and upper level courses) or their time schedule for classes. The four classes that were surveyed for this study are listed in table 3.1.

Table 3.1 Selection of classes

Class	
CRCJ 2334	Introduction to the criminal justice system
CRCJ 2335	Ethics and the criminal justice system
CRCJ 3340	Criminal justice statistics
CRCJ 3390	Victimology

Table 3.2 provides the descriptive statistics for the final sample of 167 participants. Of these 167 participants, over half (53.4%) indicated that they were between 18-21 years old, 29.2% were between 22-25 years old, and 17.4% were 26 or older. The representation of gender was almost even, with 50.9% of participants responding as male and 49.1% responding as female. Further, 31.4% of respondents identified as Caucasian, 16% as African American, 39.1% as Hispanic, and 14.1% as Asian or other. Despite the equal representation of lower and upper level classes, the majority of respondents identified as a junior (39.8%) or a senior (39.8%). Only 0.6% of students identified as a freshman and 19.9% as a sophomore. Lastly, over half of the students (60%) reported a GPA between 3.0-3.9, 35.6% had a GPA between 2.0-2.9, only 2.5% had a GPA of 4.0, and 1.9% reported not having a GPA currently.

Table 3.2 Frequencies of demographics for sample

Variable	**Frequency**	**Percent**
Age		
18-21	86	53.4%
22-25	47	29.2%
26-29	13	8.1%
30-33	8	5.0%
34 or older	7	4.3%

Table 3.2 - *continued*

Race		
Caucasian	49	31.4%
African American	25	16.0%
Hispanic	61	39.1%
Asian	14	9.6%
Other	7	4.5%
Gender		
Male	82	50.9%
Female	79	49.1%
Classification		
Freshman	1	0.6%
Sophomore	32	19.9%
Junior	64	39.8%
Senior	64	39.8%
GPA		
2.0-2.9	57	35.6%
3.0-3.9	96	60.0%
4.0	4	2.5%
No GPA	3	1.9%

3.2 Measurement Instrument

The self-administered survey was divided into six sections (See Appendix B for a complete copy of the survey). The first section consisted of a question regarding the exposure the participants have to general media sources (ex. Internet and television). Past studies have shown that there is a link between exposure to media and increased aggressive behavior (Andison, 1977). Therefore, it is important to have an understanding of the total amount of media exposure the participants have outside of playing video games. The second section consisted of questions relevant to video games specifically including content and playing habits. Researchers have suggested that violent video games have a greater impact on aggressive behavior than non-violent video games (Anderson & Bushman, 2001). Therefore, it is important to be able to compare results between the two types of video games. Only individuals that play video games were asked to fill out this second section. The third section consisted of questions related to personality and behavior which was filled out by both individuals who play video games and individuals that do not play video games. The questions were aimed at traits identified with aggressiveness and a comparison between two groups (video game players and

non-players) was analyzed. The fourth section consisted of questions regarding parental or guardian involvement in their life and restrictions of media in order to evaluate the influence of a parental figure on behavior. The fifth section consisted of questions about friends including the ability to make friends and the number of friends the participants had. The sixth and final section contained demographic questions including age, gender, race, and college level classification. Overall the questions for the survey were influenced by variables and findings of studies discussed in the literature review and characteristics that are identified with video game play and aggressive traits.

The present study was developed around two main research questions that are closely related to each other. The first question was “does video game play influence an aggressive personality, behavior, and acts?” and the second was “how does video game content influence an aggressive personality, behavior, and acts?” It was hypothesized that video game play and content will have no effect on an individual’s personality. It was hypothesized that individuals who play video games are likely to exhibit a higher level of aggressive behavior. It was also hypothesized that individuals who play violent video games are likely to exhibit a higher level of aggressive behavior. Lastly, it was hypothesized that individuals who play video games and violent video games are more likely to commit an aggressive act. The two research questions were addressed in the survey by asking different levels of each variable – video game play and video game content. Measurements of video game play included a simple yes or no question if they played video games, the amount of time spent per day and week playing video games, and what age the participant was when they started playing video games. Measurements of video game content included a simple question of whether the games played were violent or non-violent and the names of the three video games most often played. Ultimately, the survey was designed to cover various aspects of video games and behavior to analyze the main research questions.

3.3 Analysis and Variables

SPSS version 20.0 was used with the purpose of performing a quantitative statistical analysis of the completed surveys of undergraduate student participants. Several statistical tests were conducted including crosstabulations and t-tests to analyze the relationship between variables in order to address the two main research questions. The independent variables for the study included video game play (yes or no), time spent playing video games (daily and weekly), and video game content (violent or non-violent). The dependent variables for the study included aggressive personality traits, aggressive behaviors, and whether the individual has ever committed an aggressive act. Additionally, several control variables were addressed in the survey including parental involvement, friends, and demographics such as age and gender.

Table 3.3 provides the frequencies for the various independent variables listed previously. Playing video games is a nominal level variable and was measured by asking the respondent whether they play (yes) or do not play (no) video games. Over half (62.9%) of respondents answered that they do play video games and 37.1% replied that they did not play video games. The hours spent playing video games per day is an interval level variable and was measured by leaving the question open-ended for the respondent to complete. Of the 105 respondents that did play video games, 44.8% play 0-1 hour a day, 39.1% play 2-3 hours, and 16.3% play 4 or more hours per day. The days spent playing video games per week is an interval level variable and was measured by leaving the question open-ended for the respondent to complete. Out of all the participants, over half (57.5%) said they play 0-1 day per week, 17.4% play 2-3 days, 9% play 4-5 days, and 16.2% play 6-7 days per week. Lastly, the content of video games is a nominal level variable and was measured by asking the respondents whether the games played most often contained violent or non-violent content. Of the 105 participants that play video games, 43.8% said games contained mostly violent content and 56.2 percent said games contained mostly non-violent content.

Table 3.3 Frequencies of video game play

Variable	**Frequency**	**Percent**
Play video games		
Yes	105	62.9%

Table 3.3 - *continued*

No	62	37.1%
Hours spent playing video games per day		
0-1	47	44.8%
2-3	41	39.1%
4-5	11	10.5%
6+	6	5.8%
Days spent playing video games per week		
0-1	96	57.5%
2-3	29	17.4%
4-5	15	9.0%
6-7	27	16.2%
Content of video games		
Violent	46	43.8%
Non-violent	59	56.2%

Table 3.4 contains the frequencies for the various dependent variables related to aggressive personality traits. Five traits were examined including impulsivity, being angry, being outgoing, being in control of situations, and being competitive and were measured as an ordinal level variable on a five point scale from strongly agree to strongly disagree. Regarding impulsivity, most respondents either felt neutral (29.9%) or disagreed (27.5) with only 1.8% who strongly agreed that this described their personality. Regarding being angry, most respondents either disagreed (38.3%) or strongly disagreed (26.3%) with only 1.8% who strongly agreed that this described their personality. Regarding being outgoing, most of the respondents agreed (37.7%) or strongly agreed (28.7%) with only 3.6% strongly disagreeing that this described their personality. When asked about wanting to be in control of situations, most of the respondents agreed (46.1%) with only 2.4% disagreeing or strongly disagreeing with this statement. When asked about being competitive, most of the respondents strongly agreed (34.7%) or agreed (34.7%) with 1.8% strongly disagreeing with this statement.

Table 3.4 Frequencies of aggressive personality traits

Variable	Frequency	Percent
Personality Traits		
Impulsive		
Strongly agree	3	1.8 %
Agree	33	19.8 %
Neutral	50	29.9 %
Disagree	46	27.5 %
Strongly disagree	35	21.0 %
Angry		

Table 3.4 - *continued*

Strongly agree	3	1.8 %
Agree	21	12.6 %
Neutral	35	21.0 %
Disagree	64	38.3 %
Strongly disagree	44	26.3 %
Outgoing		
Strongly agree	48	28.7 %
Agree	63	37.7 %
Neutral	38	22.8 %
Disagree	12	7.2 %
Strongly disagree	6	3.6 %
In control		
Strongly agree	38	22.8 %
Agree	77	46.1 %
Neutral	47	28.7 %
Disagree	2	1.2 %
Strongly disagree	2	1.2 %
Competitive		
Strongly agree	58	34.7 %
Agree	58	34.7 %
Neutral	35	21.0 %
Disagree	13	7.8 %
Strongly disagree	3	1.8 %

Table 3.5 contains the frequencies for the various dependent variables related to aggressive behaviors and acts. Five behaviors were examined including getting into fights, trouble at school, trouble at home, trouble with the law, and physically harming someone and were measured as an ordinal level variable on a five point scale from strongly agree to strongly disagree and were asked in two ways including over a lifetime and recently (past six months). Additionally, the respondent was asked if they had ever committed an aggressive act which was measured on a nominal level by a simple yes or no response. In response to behaviors committed over a lifetime, never was the most popular response for trouble at school (75.4%), trouble at home (55.7%), trouble with the law (78.4%), and physically harming an individual (79.6%). In response to getting into fights, most respondents either rarely did (38.9) or sometimes did (31.1%) with only 1.1% responding that they always got into fights with other people. In response to behaviors committed over a lifetime, never was the most popular response for getting into fights (49.1%), trouble at school (91%), trouble at home (74.9%), trouble with the law (87.4%), and physically harming an individual (89.8%). When asked about

whether they had ever committed an aggressive act, over half (79.3%) responded they had never committed an aggressive act and 20.7% admitted that they had committed an aggressive act. Overall, it appears that the sample of participants were less likely to commit aggressive behaviors judging by the high percent of responses for “never” and the very low percent (less than 1%) for always.

Table 3.5 Frequencies of aggressive behaviors and acts

Variable	Frequency	Percent
Behavior – Lifetime		
Get into fights		
Never	37	22.2 %
Rarely	65	38.9 %
Sometimes	52	31.1 %
Often	11	6.6 %
Always	2	1.1 %
Trouble at school		
Never	126	75.4 %
Rarely	28	16.8 %
Sometimes	9	5.4 %
Often	3	1.8 %
Always	1	0.6 %
Trouble at home		
Never	93	55.7 %
Rarely	47	28.1 %
Sometimes	21	12.6 %
Often	4	2.4 %
Always	2	1.2 %
Trouble with the law		
Never	131	78.4 %
Rarely	30	18.0 %
Sometimes	6	3.6 %
Physically harming an individual		
Never	133	79.6 %
Rarely	26	15.6 %
Sometimes	7	4.2 %
Often	1	0.6 %
Behavior – Recently		
Get into fights		
Never	72	49.1 %
Rarely	53	31.7 %
Sometimes	25	15.0 %
Often	5	3.0 %
Always	2	1.2 %
Trouble at school		
Never	152	91.0 %
Rarely	9	5.4 %

Table 3.5 - *continued*

Sometimes	5	3.0 %
Always	1	0.6 %
Trouble at home		
Never	125	74.9 %
Rarely	31	18.6 %
Sometimes	7	4.2 %
Often	2	1.2 %
Always	2	1.2 %
Trouble with the law		
Never	146	87.4 %
Rarely	15	9.0 %
Sometimes	5	3.0 %
Always	1	0.6 %
Physically harming an individual		
Never	150	89.8 %
Rarely	13	7.8 %
Sometimes	2	1.2 %
Often	1	0.6 %
Always	1	0.6 %
Commit an Aggressive Act		
Yes	34	20.7 %
No	130	79.3 %

3.4 Hypothesis

There are six primary hypotheses being tested in the present study. These hypotheses are as follows:

H1: There is no effect of video game play on an individual's personality.

H2: There is no effect of video game content on an individual's personality.

H3: Individuals that play video games are more likely to exhibit aggressive behavior than individuals that do not play video games.

H4: Individuals that play violent video games are more likely to exhibit aggressive behavior than individuals that play non-violent video games primarily.

H5: Individuals that play video games are more likely to have committed an aggressive act than individuals that do not play video games.

H6: Individuals that play violent video games are more likely to have committed an aggressive act than individuals that play non-violent video games.

CHAPTER 4

ANALYSIS

SPSS version 20.0 was used for the analysis of survey data in this study. Several statistical analyses including t-tests, Eta, and Goodman and Kruskal's tau were conducted to test the six hypotheses previously mentioned regarding the relationship between video games and aggressive behaviors, personality, and acts. The results for each test are displayed in tables and discussed in this section.

Table 4.1 Mean levels of aggressive personality traits of respondent by video game play (standard deviation in parentheses)

Personality Trait	Does play	Does not play	P-value
Impulsive	2.54 (1.029)	2.52 (1.211)	0.4400
Angry	2.26 (1.038)	2.24 (1.051)	0.4640
Outgoing	3.82 (1.045)	3.79 (1.058)	0.4325
In Control	3.87 (0.748)	3.90 (0.918)	0.3900
Competitive	4.00 (0.930)	3.81 (1.143)	0.1305

Table 4.1 shows the results for mean levels of aggressive personality traits of the respondents by whether or not they play video games. The personality traits were measured on a scale of 1 to 5, with a response of 1 indicating that the respondent strongly disagreed with the trait and a response of 5 indicating that the respondent strongly agreed with the trait. As shown in the table, the mean difference for each personality trait between individuals that play video games and do not play video games varies very little. For the impulsive and angry items, both the does play and does not play group of respondents felt that these traits did not describe their personality and disagreed with the statements. For the outgoing, being in control, and competitive items, both groups of respondents scored higher and were likely to agree that these traits did describe their personality. Of the five items listed for personality traits, none were

found to be significant and the p-values were relatively high (between 0.11 and 0.46). Overall, the respondents that do play video games and do not play video games responded similarly to each personality trait. These findings suggest that there is no relationship between playing video games and personality traits, specifically traits identified with aggressiveness.

Table 4.2 Mean levels of aggressive personality traits of respondent by video game content (standard deviation in parentheses)

Personality Trait	Violent content	Non-violent content	P-value
Impulsive	2.63 (0.981)	2.43 (1.088)	0.1720
Angry	2.31 (0.987)	2.20 (1.108)	0.2970
Outgoing	3.80 (1.030)	3.85 (1.074)	0.4025
In Control	3.83 (0.647)	3.91 (0.865)	0.2885
Competitive	3.93 (.944)	4.09 (0.915)	0.2000

Table 4.2 contains the mean levels of aggressive personality traits of the respondents based on whether video game content was violent or non-violent. The personality traits were measured on a scale of 1 to 5, with a response of 1 indicating that the respondent strongly disagreed with the trait and a response of 5 indicating that the respondent strongly agreed with the trait. The respondents who answered that they did play video games were then asked to identify whether the video games they played most often contained violent or non-violent content. As shown in the table, there is little variance between the mean difference of the violent and non-violent groups. For the items of being impulsive or angry, respondents of both groups were more likely to disagree that these traits described their personality. For the items of being outgoing, in control of situations, and competitive, the respondents of both groups were more likely to agree that these traits described their personality. Of the five items tested for aggressive personality traits, none were found to be significant with relatively high p-values (between 0.17 and 0.4). Overall, the respondents that do play violent video games and non-violent video games similarly responded to each personality trait. These results suggest that

there is no relationship between the content of video games that individuals are exposed to and personality traits, specifically aggressive traits.

Table 4.3 Mean levels of aggressive behaviors of respondent by video game play (standard deviation in parentheses)

Behavior	Does Play	Does not play	P-value
Get into fights at any point	2.22 (0.909)	2.32 (0.937)	0.2415
Trouble at school at any point	1.39 (0.779)	1.29 (0.611)	0.1935
Trouble at home at any point	1.65 (0.888)	1.66 (0.867)	0.4615
Trouble with the law at any point	1.27 (0.542)	1.23 (0.459)	0.3095
Physically harming an individual at any point	1.28 (0.580)	1.23 (0.525)	0.2875
Get into fights recently	1.76 (0.956)	1.74 (1.808)	0.4455
Trouble at school recently	1.12 (0.432)	1.16 (0.606)	0.3210
Trouble at home recently	1.34 (0.663)	1.37 (0.834)	0.4055
Trouble with the law recently	1.18 (0.496)	1.16 (0.578)	0.4080
Physically harming an individual recently	1.13 (0.482)	1.15 (0.568)	0.4430

The results for the mean levels of aggressive behaviors of the respondents by whether they play video games are shown in Table 4.3. The behaviors were measured on a five point scale, with a score of 1 indicating that the respondent never committed the behavior and a score of 5 indicating that the respondent always the committed the behavior. Additionally, the five behaviors were measured in two ways – over a lifetime and recently (within the past 6 months). When asked about behaviors over a lifetime, respondents of both groups were less likely to have committed these behaviors on a regular basis. The items of trouble at home, school, or the law, and physically harming an individual were likely to have never been committed by respondents. The item of getting into fights was likely to have rarely been committed by respondents. When asked about behaviors recently (over past six months), respondents of both groups were less likely to have committed these behaviors on a regular basis. For the five items listed in the table, the respondents were likely to have never committed

these behaviors in the past six months. The results between the respondents that played video games and did not play video games varied very little as did the results between behaviors over a lifetime and recently. Of the 10 items tested, there was no significant relationship exhibited in any of them with relatively high p-values (between 0.24 and 0.44). These findings suggest that individuals that play video games are not more likely to exhibit aggressive behaviors than individuals that do not play video games.

Table 4.4 Mean levels of aggressive behaviors of respondent by video game content (standard deviation in parentheses)

Behavior	Violent	Non-violent	P-value
Get into fights at any point	2.32 (0.860)	2.09 (0.962)	0.8000
Trouble at school at any point	1.42 (0.835)	1.35 (0.706)	0.3110
Trouble at home at any point	1.71 (0.966)	1.57 (0.779)	0.2020
Trouble with the law at any point	1.32 (0.600)	1.20 (0.453)	0.1110
Physically harming an individual at any point	1.37 * (0.667)	1.15 (0.420)	0.0205*
Get into fights recently	1.76 (0.858)	1.76 (1.079)	0.4960
Trouble at school recently	1.14 (0.472)	1.11 (0.379)	0.3765
Trouble at home recently	1.42 (0.747)	1.24 (0.524)	0.0705
Trouble with the law recently	1.22 (0.559)	1.13 (0.400)	0.1795
Physically harming an individual recently	1.19 (0.601)	1.07 (0.250)	0.0825

* sig. @ p< 0.05
** sig @ p< 0.01
*** sig. @ p< 0.001

The results for the mean levels of aggressive behaviors of the respondents by video game content are shown in Table 4.4. The behaviors were measured on a five point scale, with a score of 1 indicating that the respondent never committed the behavior and a score of 5 indicating that the respondent always committed the behavior. Additionally, the five behaviors were measured in two ways – over a lifetime and recently (within the past 6 months). The respondents that responded they did play video games were asked whether the video games played most frequently contained mostly violent or non-violent content. When asked about

behaviors over a lifetime, respondents of both the violent and non-violent group were less likely to have committed these behaviors on a regular basis. The items of trouble at school, home, or with the law, and physically harming an individual were likely to have never been committed by respondents. The item of getting into fights was likely to have rarely been committed by respondents. When asked about behaviors recently (over past six months), respondents of both content groups were less likely to have committed these behaviors on a regular basis. For the five items listed in the table, the respondents were likely to have never committed these behaviors recently. The results between the respondents that played video games and did not play video games varied very little as did the results between behaviors over a lifetime and recently. Of the 10 items tested, there was one significant relationship which was found in physically harming an individual over a lifetime. With equal variances not assumed, the p-value for this behavior was 0.02 and found to be significant at the 0.05 level. Although the relationship is significant, caution should be taken due to the small degree of difference between the two groups (1.37 for violent and 1.15 for non-violent). These findings suggest that individuals that play video games are not more likely to exhibit aggressive behaviors than individuals that do not play video games except for physically harming an individual.

Table 4.5 Frequency of how time is spent by respondents

Variable	Frequency	Percent
Alone	75	46.3 %
With friends	87	53.7 %

Table 4.5 displays the frequency for how respondents most often spent their time – either alone or with their friends. The way respondents spent their time was a control variable and was examined in the relationship that was found to be significant between video game content and physically harming an individual. As shown in the table, respondents are more likely to spend time with friends (53.7%) than alone (46.3%). The responses for each group are close in number (87 for with friends and 75 for alone) which made it a good variable candidate for comparison.

Table 4.6 Mean levels of physically harming an individual during a lifetime by video game content when time is spent alone (standard deviation in parentheses)

Behavior	Violent content	Non-violent content	P-value
Physically harming an individual	1.50 (0.618)	1.13 (0.338)	0.0145

Table 4.6 contains the mean levels of physically harming an individual during a lifetime by video game content based on time spent alone. Data for this test was filtered by the control variable of how time was spent and was selected from the 75 respondents that mostly spent their time alone. The item, physically harming an individual over a lifetime, was the only one to be found significant in previous t-tests and was measured based on a five point scale, with a score of 1 indicating strongly disagree and a score of 5 indicating strongly disagree. For both the violent and non-violent content group, the responses indicate likelihood that the respondent never physically harmed an individual. The p-value of 0.0145 indicates significance at a 0.05 level but the difference between the two groups is small (1.5 for violent compared to 1.13 for non-violent). Therefore, it can be concluded that individuals who spend their time alone and play violent games are more likely to physically harm an individual than individuals who spend their time alone and play non-violent games.

Table 4.7 Mean levels of physically harming an individual during a lifetime by video game content when time is spent with friends (standard deviation in parentheses)

Behavior	Violent content	Non-violent content	P-value
Physically harming an individual	1.33 (0.694)	1.15 (0.489)	0.159

Table 4.7 contains the mean levels of physically harming an individual during a lifetime by video game content based on time spent with friends. Data for this test was filtered by the control variable of how time was spent and was selected from the 87 respondents that mostly spent their time with friends. The item, physically harming an individual over a lifetime, was the only one to be found significant in previous t-tests and was measured based on a five point scale, with a score of 1 indicating strongly disagree and a score of 5 indicating strongly disagree. For both groups, the responses indicate likelihood that the respondent never

physically harmed an individual. With a p-value of 0.159, no statistical significance was found in this relationship. Therefore, it can be concluded that individuals who spend time with friends and play violent games are not more likely to physically harm an individual than individuals who spend time with friends and play non-violent games.

Table 4.8 Crosstabulation of committing an aggressive act by video game play of days per week

Committing an Aggressive act	0 days	1 days	2 days	3 days	4 days	5 days	6 days	7 days
Yes	10	5	4	2	3	2	2	6
No	63	16	7	15	3	7	5	14
* ETA coefficient = 0.237								

Table 4.8 displays the crosstabulation for committing an aggressive act by the number of days respondents play video games per week. As shown in the table, most respondents indicated that they play video games 0 days a week. Of those 73 respondents, 63 indicated that they had never committed an aggressive act and 10 indicated that they had committed an aggressive act. Of the 20 respondents that play every day of the week, 14 indicated that they had never committed an aggressive act and 6 indicated that they had committed an aggressive act. Of the 6 respondents that play 4 days a week (roughly half the week), 3 admitted they had committed an aggressive act and 3 replied that they had never committed an aggressive act. Overall, it appears that more respondents have committed an aggressive act regardless of how many days spent playing video games per week. The Eta correlation coefficient of 0.237 indicates a weak correlation between the days spent playing video games per week and committing an aggressive act. Additionally, the symmetrical PRE value of 0.056 indicates that only 5.6% of variation in committing an aggressive act is explained by the amount of days per week spent playing video games.

Table 4.9 Crosstabulation of committing an aggressive act by video game play of hours per day

Committing an aggressive act	<1 hour	1 hour	2 Hours	2.5 hours	3 hours	4 hours	5 hours	6 hours	8 hours	14 hours
Yes	1	8	6	0	4	3	3	0	0	0
No	14	22	23	1	7	4	1	4	1	1

Table 4.9 displays the crosstabulation for committing an aggressive act by the hours per day spent playing video games. As shown in the table, the majority of respondents play 1-2 hours per day. Of the 59 respondents that play 1-2 hours per day, 45 indicated that they had never committed an aggressive act and 14 indicated that they had committed an aggressive act. Of the 10 respondents that play 5 or more hours a day, 7 respondents indicated they had never committed an aggressive act and 3 admitted that they had committed an aggressive act. Of the 15 respondents that play less than one hour per day, 14 have never committed an aggressive act and 1 admitted that they had committed an aggressive act. The Eta correlation coefficient of 0.384 indicates a moderate correlation between the hours spent playing video games per day and committing an aggressive act. Additionally, the symmetrical PRE value of 0.1474 indicates that only 14.74% of variation in committing an aggressive act is explained by the amount of days per week spent playing video games.

Table 4.10 Crosstabulation of committing an aggressive act by video game play

Committing an aggressive act	Does play video games	Does not play Video games
Yes	26	8
No	77	53
* Goodman and Kruskal tau = 0.021, p= 0.065		

Table 4.10 contains the crosstabulation of committing an aggressive act by whether or not respondents play video games. Of the 103 respondents that play video games, 77 have not committed an aggressive act and 26 admitted to committing an aggressive act. Of the 61 respondents that do not play video games, 8 admitted to committing an aggressive act and 53 had not committed an aggressive act. According to Goodman and Kruskal's tau value of 0.021, there is no association and only 2.1% of the variation in committing aggressive acts is explained by video game play. The p-value of 0.065 indicates no significance in this relationship. Therefore, it can be concluded that video game play has no effect on whether or not an individual commits an aggressive act.

Table 4.11 Crosstabulation of committing an aggressive act by video game content

Committing an aggressive act	Violent content	Non-violent content
Yes	17	9
No	41	36
Goodman and Kruskal tau= 0.011, p= 0.283		

Table 4.11 contains the crosstabulation of committing an aggressive act by the content of video games played by respondents. Of the 58 respondents that play violent video games, 41 have not committed an aggressive act and 17 admitted to committing an aggressive act. Of the 45 respondents that do not play video games, 9 admitted to committing an aggressive act and 36 had not committed an aggressive act. According to Goodman and Kruskal's tau value of 0.011, there is no association and only 1.1% of the variation in committing aggressive acts is explained by video game content. The p-value of 0.283 indicates no significance in the relationship. Therefore, it can be concluded that content of video games has no effect on whether or not an individual commits an aggressive act.

Overall, only H1 and H2 (claiming that video game play and content would have no effect on aggressive personality), were fully supported by the statistical tests. There was some support for H4 (individuals that play violent video games are more likely to exhibit aggressive behavior than individuals that play non-violent video games primarily) which was found in the variable of physically harming an individual over a lifetime. For the other three hypotheses, the results did not support the claim made in each hypothesis and therefore there was a failure to accept them. These included H3 (individuals that play video games are more likely to exhibit aggressive behavior than individuals that do not play video games), H5 (individuals that play video games are more likely to have committed an aggressive act than individuals that do not play video games), and H6 (individuals that play violent video games are more likely to have committed an aggressive act than individuals that play non-violent video games). A discussion of these findings is addressed in the concluding chapter.

CHAPTER 5

CONCLUSION

5.1 Study Results and Previous Literature

Overall, the main conclusions to be drawn from this study is that video games, both exposure and content, did not lead to an increase in aggressive personality traits, behavior, or acts in the participants. The results reveal that there was not a strong correlation between video games and aggressiveness as was hypothesized. As hypothesized in H1 and H2, video game play and content were shown to have no effect on an individual's aggressive personality. Therefore, personality traits are recommended as a control variable to eliminate the possibility that aggressive individuals are attracted to video games which would increase aggressive behavior. H3 and H4 produced a difference in results between the effect of video game play and content on aggressive behavior. H3 hypothesized that video game play would increase aggressive behavior but results failed to support this claim in the five different behaviors measured. H4 hypothesized that video game content would increase aggressive behavior but results failed to support this claim in four different behaviors and a slight significance was found in the item regarding physically harming an individual. H5 and H6 were both rejected and the results revealed that neither video game play nor content had an influence on the likelihood of an individual to commit an aggressive act. Overall, the results of the present study were not similar to the results of previous studies that have shown there is some relationship between video games and aggressive behavior.

Previous research, for video games and other media outlets, has found that exposure to video games and media can increase aggressive behavior. It was expected that the hypotheses tested in the present study would produce similar results but that was not the case. There were several differences between the present study and previous research that may account for the

conflicting results. The present study consisted of 167 participants in various criminal justice classes compared to Anderson and Bushman's (2002) study to test the General Aggression Model which consisted of 224 students enrolled in an introductory psychology course. Unlike the GAM study, the present study did not reward extra credit or provide a benefit for the course in exchange for participation in the survey (Anderson & Bushman, 2002). The present study relied on survey research whereas many studies utilize a laboratory experiment in which the participants play a video game for a short period of time. This allows the researchers to develop measurements for the immediate effect of video games rather than relying on the responses in surveys (Ferguson et al, 2008). There is still uncertainty and debate in studies about the role of personality in the relationship between video games and aggressive behavior. Despite the debate among researchers, it has generally been agreed upon that there is a correlation between video game play and aggressive behavior which was not found in the present study (Carnagey & Anderson, 2005).

5.2 Limitations and Future Research

As with all studies, there were several limitations in the present study. Firstly, the analysis of results was limited by the assumption that respondents were accurate and truthful in their answers to the survey questions. Respondents may have not have felt comfortable responding to potentially sensitive questions, may not remember incidents in their past exactly, or may have answered questions to make themselves look better or well-behaved (ex. never getting in a fight). This is a risk that is associated with all survey research and must be taken into consideration, especially for outliers. Secondly, the study utilized only a survey method of research, due to convenience, which did not allow for the analysis of the immediate effect of video game play. Previous studies often conduct a laboratory experiment in which participants play video games for a short period of time followed by a questionnaire which allows for a more extensive analysis (Anderson & Bushman, 2002; Przybylski et al, 2009). Additionally, a laboratory experiment allows for the researchers to measure the immediate effect of video

game play whereas the survey used for the present study has a potential time order issue and can not distinguish between immediate and lifetime effects. Thirdly, the definition of aggression, in regards to behavior and acts, was left open for interpretation for the participant which may contribute to inconsistency in the results. Lastly, only one campus (University of Texas at Arlington) was surveyed which limited the ability to compare and control for factors that may be a result of geographic location. Additionally, only four classes were included in the study which resulted in a relatively small sample size (167 individuals) and the classes were only within the criminal justice department. As a result, the results of the study may not be a representative sample of undergraduate students and are not able to be generalized to the college student population.

As a result of the limitations present in this study and the conflict of results in analysis with that of previous studies, several suggestions are made for future research in the field of video games and aggressive behavior. Aggressive personality traits are recommended as a control variable to help establish correlation in the correct direction for the relationship of video games and aggressive behavior. Controlling for personality traits allows for increased confidence to conclude that video game play contributes to aggressive behavior rather than aggressive individuals are attracted to video games. Another control variable, gender, may warrant an in-depth analysis to compare video game habits in males and females and differences in aggressive tendencies. Previous media studies have touched on gender differences but few have attempted to explain why these differences exist (Kirsh & Olczak, 2002). In addition to the effect of video games on behavior, it may be of interest to consider the effect of media as a whole on behavior and which media outlet has the most influence on an individual. Most individuals are exposed to multiple media outlets and it may be difficult to isolate the effect of video games specifically. Therefore, asking a question about exposure to media (such as days in a week) may help in this consideration. Thirdly, a bigger sample size consisting of classes in different departments and across different campuses would allow for the

results to be generalized to the population of college students. It would be beneficial to utilize different majors versus criminal justice students for a comparative analysis to examine whether there is a significant difference between the two groups in which factors such as desensitization may be an explanation. Lastly, the majority of studies have been survey research or laboratory experiments to evaluate the effects of video games on short-term aggression, but the field is lacking in studies regarding the long-term effects. Due to time constraints and convenience, the present study was unable to address this therefore there is a need for longitudinal studies to expand upon the literature on video games and aggressive behavior. Overall, the studies of video game effects are a relatively new area of interest, only gaining popularity in the last decade; therefore there are still several unanswered questions and gaps that can be addressed by future research.

APPENDIX A

INFORMED CONSENT FORM

INFORMED CONSENT

PRINCIPAL INVESTIGATOR: Marisa Prokarym

FACULTY ADVISOR: Dr. Rhonda Dobbs

TITLE OF PROJECT
The Effects of Video Games on Aggressive Behavior

INTRODUCTION
You are being asked to participate in a research study. Your participation is voluntary. Please ask questions if there is anything you do not understand.

PURPOSE
The specific purposes of this research study are as follows:

1. To gain an understanding of video game habits.
2. To gain an understanding of the effect of video games on behavior.

DURATION
Participation in this study will last approximately 10 minutes.

NUMBER OF PARTICIPANTS
The expected number of participants in this study is 300.

PROCEDURES
The procedures which involve you as a research participant include completing the survey. After your completion, the responses for the survey will be collected and recorded into SPSS by the researcher. The surveys will be kept for possible future research purposes by the researcher.

POSSIBLE BENEFITS
There are no direct benefits for the participant by completing the survey.

POSSIBLE RISKS/DISCOMFORTS
Some of the questions you are asked to answer during the survey may appear sensitive in nature. If you feel uncomfortable at any time while participating in the survey you may choose to leave any questions blank or quit without consequence.

COMPENSATION
There will be no compensation offered for participation in the survey.

ALTERNATIVE PROCEDURES
There are no alternative procedures offered for this study. However, you can elect not to participate in the study or quit at any time with no consequences.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. You are free to withdraw consent and to discontinue participation at any time without penalty. Your choice of participation will have no effect on your grade or standing in the class.

CONFIDENTIALITY
Every attempt will be made to see that your study results are kept confidential. A copy of the survey and all data collected from this study will be stored in University Hall Room 354 for at least three (3) years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a participant. Additional research studies could evolve from the information you have provided, but your information will not be linked to you in anyway, you will be anonymous. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the UTA Institutional Review Board (IRB), and personnel particular to this research have access to the study records. Your records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above. The IRB at UTA has reviewed and approved this study and the information within this consent form. If in the unlikely event it becomes necessary for the Institutional Review Board to review your research records, the University of Texas at Arlington will protect the confidentiality of those records to the extent permitted by law.

CONTACT FOR QUESTIONS
Questions about this research study may be directed to Marisa Prokarym at Marisa.Prokarym@mavs.uta.edu or Dr. Rhonda Dobbs at Rdobbs@uta.edu. Any questions you may have about your rights as a research participant may be directed to the Office of Research Administration; Regulatory Services at 817-272-2105 or regulatoryservices@uta.edu.

CONSENT
By continuing with the survey, you confirm that you are 18 years of age or older and have read or had this document read to you.
You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you start the survey, and you have been told that you can ask other questions at any time

You voluntarily agree to participate in this study. By continuing with this survey, you are not waiving any of your legal rights. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits, to which you are otherwise entitled.

APPENDIX B

SURVEY

Survey – Video Games

The purpose of this survey is to examine individuals that play video games. The results of the survey will be used to understand the impact of exposure to video games on their life.

Media

1. How many days in a typical week do you do the following?

	0	1	2	3	4	5	6	7
a. Watch television	☐	☐	☐	☐	☐	☐	☐	☐
b. Rent or go to the movies	☐	☐	☐	☐	☐	☐	☐	☐
c. Play video or computer Games	☐	☐	☐	☐	☐	☐	☐	☐
d. Read books (excluding textbooks)	☐	☐	☐	☐	☐	☐	☐	☐
e. Read the newspaper or magazines (excluding online articles)	☐	☐	☐	☐	☐	☐	☐	☐
f. Use the internet	☐	☐	☐	☐	☐	☐	☐	☐

Video Games

2. Do you play video games? (Ex. XBOX, Playstation 3, WII, computer, etc.)

□ Yes (Please continue to question 2a.)

□ No (Please skip questions 2a-2h and continue to question 3 on page 5.)

2a. How old were you when you first started playing video games?

_____ years old

2b. What is the **primary** reason that you play video games? (*Mark only one.*)

□ Entertainment/Fun

□ Competition

□ Spend time with friends

□ Stress relief

□ Other: _____

2c. What genre of video games do you play **most** often? (*Mark only one.*)

□ Action (includes shooter games)

□ Music/Dance

□ Racing

□ Role-playing

□ Sports

□ Other: _____

2d. What three video games do you play **most** frequently?

1. _____
2. _____
3. _____

2e. Do the video games listed in question 2d contain **mostly** violent or non-violent content?

□ Violent

□ Non-violent

2f. How many hours in a typical day do you spend playing video games?

_____ hours

2g. Do you play video games **more** frequently alone or with friends?

□ Alone

□ Friends

2h. Please rate how accurate each statement describes your video game playing habits.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
a. It is difficult to quit playing.	☐	☐	☐	☐	☐
b. I get mad/frustrated if I don't "win".	☐	☐	☐	☐	☐
c. I think about mimicking actions/events in video games.	☐	☐	☐	☐	☐
d. My mood is influenced by games	☐	☐	☐	☐	☐

Personality and Behavior

3. Please rate how accurate each statement describes your personality.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. I am impulsive.	☐	☐	☐	☐	☐
b. I anger easily.	☐	☐	☐	☐	☐
c. I am outgoing.	☐	☐	☐	☐	☐
d. I like to be in control of situations.	☐	☐	☐	☐	☐
e. I am competitive.	☐	☐	☐	☐	☐

4. Please rate how often you have done the following in your life (at any point in time).

	Never	Rarely	Sometimes	Often	Always
a. I get in fights (verbal or non-verbal).	☐	☐	☐	☐	☐
b. I get in trouble at school.	☐	☐	☐	☐	☐
c. I get in trouble at home.	☐	☐	☐	☐	☐
d. I get in trouble with the law.	☐	☐	☐	☐	☐
e. Physically harming an individual.	☐	☐	☐	☐	☐

5. Please rate how often you have done the following **recently** (in the past six months).

	Never	Rarely	Sometimes	Often	Always
a. I get in fights (verbal or non-verbal).	☐	☐	☐	☐	☐
b. I get in trouble at school.	☐	☐	☐	☐	☐
c. I get in trouble at home.	☐	☐	☐	☐	☐
d. I get in trouble with the law.	☐	☐	☐	☐	☐
e. Physically harming an individual.	☐	☐	☐	☐	☐

6. Have you ever committed an aggressive or violent act?

□ Yes (Please answer question 6a and 6b.) →

□ No (Please skip to question 7.)

6a. Do you feel this behavior was influenced by video games?

□ Yes

□ No

□ Not applicable (do not play video games)

6b. Approximately how old were you when you committed your first aggressive or violent act?

_____ years old

7. Have you ever been the victim of an aggressive or violent act?

□ Yes

□ No

Parents/Guardians

8. While growing up, did you feel your parents/guardians were actively involved in your life?

□ Yes

□ No

9. Did your parents/guardians limit the time you spent with media (television, internet, etc)?

□ Yes

□ No

10. Did your parents/guardians enforce suggested media ratings (ex. Film, video game, television ratings)?

□ Yes

□ No

Friends

11. Do you make friends easily?

    □ Yes

    □ No

12. Approximately how many close friends do you have?

    □ None

    □ 1-2

    □ 3-4

    □ 5 or more

13. In general, do you spend more time alone or with friends?

    □ Alone

    □ Friends

Demographics

14. Age:

    □ 18-21

    □ 22-25

    □ 26-29

    □ 30-33

    □ 34 or older

15. Gender:

    □ Male

    □ Female

16. Race/Ethnicity:

□ Caucasian

□ African American

□ Hispanic

□ Asian

□ Other

17. Classification:

□ Freshman

□ Sophomore

□ Junior

□ Senior

□ Other

18. Current college GPA:

□ 1.9 or under

□ 2.0-2.9

□ 3.0-3.9

□ 4.0

□ No GPA currently (first semester)

Thank you for taking the time to complete this survey!

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BIOGRAPHICAL INFORMATION

Marisa Prokarym earned her Bachelor of Arts degree in Criminology & Criminal Justice from the University of Texas – Arlington in the Fall semester of 2010. She is set to graduate in the Fall semester of 2012 with her Masters of Arts degree in the same field of study at the same university. Her research interests include media and its role on an individual's behavior. Following graduation, her future career plans include enlisting in the Air Force and later achieving employment at the federal level of the United States government. Future academic plans include a possibility of achieving a doctorate in Criminology or a law degree.