

DOES INTENDED AGGRESSIVE ACTIVITY INCREASE UNINTENDED
AGGRESSIVE ACTIVITY WITHIN VIDEO GAMES?

A DISSERTATION

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BY

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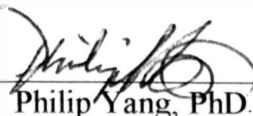
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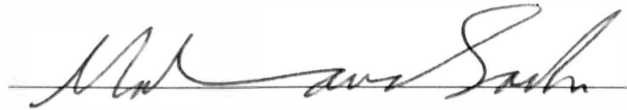
To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Sherry Cooke Hayes entitled "Does Intended Aggressive Activity within Video Games Increase Unintended Aggressive Activity within Video Games?" I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Sociology.

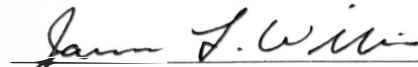


Philip Yang, PhD., Major Professor

We have read this dissertation and recommend its acceptance:



Mark S. Hammer



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Accepted:



Dean of the Graduate School

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DEDICATION

For my late father, Ernest H. Cooke.

To my children and grandchildren,
Ryan, Rico, Jamie, Jordan, Emylie, Zorah and Ellis
thank you for being there when I needed you
and never running out of hugs.
I greatly appreciate your insights, suggestions and
kind criticisms.

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I thank Dr. Nick Yee for so graciously making his original data available so that other graduate students could benefit and expand upon his work. Lastly, I would like to

thank my family and friends who never gave up on me. They were my strength, the shoulders to cry on, and a consistent source of encouragement.

ABSTRACT

SHERRY COOKE

DOES INTENDED AGGRESSIVE ACTIVITY INCREASE UNINTENDED AGGRESSIVE ACTIVITY WITHIN VIDEO GAMES?

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There has been an on-going debate on the effect of video games on the aggressive behavior of players once they are no longer engaged in play within the virtual world. The claim asserts that the aggressive activity that is a fundamental part of game's design, teaches the same type of aggressive activity outside the video game.

This study joins this debate with one guiding question: does intended aggressive activity increase unintended aggressive activity *within* the video game? Logic dictates that negative aggressive behavior should manifest itself first within the game, before being practiced in the real world. To answer this question, this study proposes a virtual game theory, which has its foundation in the symbolic interaction paradigm and is an offshoot of differential association theory and social learning theory.

The general hypothesis to be tested is that playing a Massively Multiplayer Online Role Playing Game, a goal-oriented aggressive activity, continuously for long hours has no significant effect on non-goal-oriented aggressive activities such as killing, annoying, and provoking.

The data for this study come from the Internet survey conducted by Dr. Nick Yee from May to July, 2005 with 1879 online video game players. The main method of analysis is ordinary least squares regression because the dependent variable is a composite scale.

The results show that playing a game raid for eight hours continuously has no significant effect on negative aggressive behavior within the video game, nor has playing the video game for 10 hours continuously after holding control variables constant. These findings are consistent with my hypothesis. In addition, this study finds that the player's age and gender have significant impacts on negative aggressive behavior within the video game. The findings suggest that negative aggressive activity may be related to innate qualities of the player, not the game. The virtual world does not have the ability to successfully complete the task of resocializing individuals that social institutions often fail to accomplish.

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CHAPTER I

INTRODUCTION

"This idea, that the true object of war is peace . . ." Sun Tzu.

The idea that video games could teach aggressive behavior is a very popular belief. So popular that it led the U.S. Government to grant 1.5 million dollars to Harvard University researchers Kutner and Olsen to investigate the effects of video games on juveniles (Kutner and Olsen 2005). This expense was allocated in a time when the U.S. external deficit stood at \$666 billion (Federal Reserve Board 2005) demonstrating the degree of concern over this issue.

History is replete with games of intense violence and aggression, necessary to teach young warriors. Sun Tzu stated that there is an art to war and outlined a systematic method to teach armies how to defeat one's enemies (Sun Tzu [1910] 2003). Spectator sports such as the Roman gladiators were exhibitions to the death. Coliseums and amphitheaters throughout the Roman Empire drew entire families to enjoy the entertainment of watching others die. Being a gladiator was so coveted that many gave up their citizenship in exchange for slave status for a specified period of time in order to fight as a gladiator (Kyle 1998). The participants in these activities enjoyed the praise and adulation of others and were honored by their societies.

The connection between violence and aggressive behavior is a modern phenomenon. Public executions were a way of life for centuries. However, it was not until the mid-eighteen hundreds that many worried about the effect of public executions had on the public viewers. Interestingly, it was not the concept that violence inspired aggressive behavior that created public apprehension. The purpose of the executions was to instill fear and awe in the spectators. The gruesomeness of the execution was to serve as a crime deterrent for others. The executions were having the opposite affect; executions had become social events, with the condemned being glorified by the crowd for heroically facing death (McGowen 1994). In America the last public execution was the hanging of Rainey Bethea on August 14, 1936. There can be nothing more aggressive than taking the life of another, in full view of all citizens of all ages, yet there was no concern that centuries of public executions taught the spectator aggressive behavior.

With the rash of school shooting over the last decade, modern concerns have concluded that virtual violence can teach aggressive behavior when real world violence did not (Kirsh, Oczak, and Mounts 2005). Public belief that exposure to violent video games is detrimental to juveniles led Representative Joe Baca and 21 cosponsors to introduce a bill entitled "Protect Children from Video Game Sex and Violence Act of 2002" (Saunders 2003).

This concern is further fueled by reports of the growing popularity of video games. A recent Nielsen poll touts video games as the "5th network" closing in on the

television station NBC (Shields 2009). Newsvine (a subsidiary of MSNBC), a global retail market research company, reported that sales of video games in January 2009 totaled \$1.33 billion, a 13 percent increase over the sales in January 2008 (Ortutay 2009). The Nielsen Company also states that the most popular game played is World of Warcraft, a game with virtual violence as a necessary component for success within the game. According to Blizzard Entertainment (2008), in a November 21, 2008 press release, World of Warcraft had 11.5 million subscribers worldwide. Consumers spent \$18.85 billion on video game software and hardware in 2007 (Smith 2008).

This increased popularity of video games is often cited as a cause of the epidemic of juvenile violence (Anderson and Murphy 2003, Anderson Bushman and Rothstein 2010, Anderson and Ford 1986, Anderson and Dill. 2000, Arriaga 2006, Grossman and DeGaetano 1999). Although long before the vast popularity of video games known today, the increase in juvenile violence was a public issue. The Department of Justice reported that juvenile murder increased 172 percent from 1985 to 1994. The first person shooter games were not released until the early 1990s. The game that is attributed with defining the genre “Wolfenstein 3D” was not released until on May 5, 1992 for play on a DOS system (Wolfenstein History, retrieved on October 11, 2010 from <http://www.mac-archive.com/wolfenstein/history.html>). With the rise in popularity of video games, we find that juvenile violence is not increasing but decreasing. In his testimony to Congress, before the U.S. Senate Judiciary Committee, Shay Bilchik, founder of the Center for Juvenile Justice Reform, had this to say about juvenile violence:

Therefore, I would like to begin my testimony with an overview of the juvenile offending landscape since the last reauthorization of the Juvenile Justice and Delinquency Prevention Act (JJDP) in 2002 -- and in the previous decade. It is a landscape that has dramatically changed.

First, juvenile crime has decreased substantially over this time period. Today, youth crime and delinquency in the United States remain near the lowest levels seen in the past three decades. (Bilchik 2007).

Another popular belief is that playing aggressive video games is scientifically linked to increased aggression in youths. This idea was supported by a list of resolutions released by the American Psychological Association in 2005, which stated with scientific certainty, video games:

WHEREAS psychological research reveals that the electronic media play an important role in the development of attitude, emotion, social behavior and intellectual functioning of children and youth . . . and

WHEREAS there appears to be evidence that exposure to violent media increases feelings of hostility, thoughts about aggression, suspicions about the motives of others, and demonstrates violence as a method to deal with potential conflict situations. . .

WHEREAS comprehensive analysis of violent interactive video game research suggests such exposure a.) increases aggressive behavior, b.) increases aggressive thoughts, c.) increases angry feelings, d.) decreases helpful behavior, and, e.) increases physiological arousal. . . Retrieved October 13, 2010 (<http://www.apa.org/about/governance/council/policy/interactive-media.pdf>).

It is in the nature of society to resist new technology, a tendency defined in sociology as cultural lag (Ogburn 1937; Woodard 1936). Common with cultural lag is public stress and strain with additional maladjustment between culture and technology (Ogburn 1937). The resistance to video games has resulted in numerous myths creating the impression that video games inspire aggression. For example, in 2007 when Cho

Seung-Hui killed 32 people at Virginia Tech, first reports claimed that he spent endless hours playing video games (Benedetti 2007). However, the panel investigating the incident did not mention video games in their final report (Virginia Governor Report 2010). The shooter at Northern Illinois University who killed six and wounded 18 others on February 14, 2008 had no obsession with playing video games (Ferguson 2008). Likewise the young man that opened fire in a Utah mall February 12, 2007 did not possess a computer or video games (Ferguson 2008). That young man did, however, have firsthand knowledge and experience with real war in Serbia, losing his grandfather to the bombings and fleeing the country with his family in the midst of war (Arnaut 2007).

Incidents such as the ones just mentioned are used to support concerns about video games and the ability of these games to teach violence. The media often jumps to the conclusion that these shooters had been taught by endless hours of violent video game play. In the past, researchers generated data that at first glance seem to link video games to juvenile crime and violence. As a result, video games have become the “easy target” answer to explain youth aggressive behavior. Therein lies the problem and is at the heart of this study. Public policy and programs designed to address the true underlying issues of juvenile violence are busy chasing a red herring, wasting precious time and resources which would be more effective in other arenas, such as educating parents.

These myths and misperceptions make this study necessary. The focus of this study is to test whether the repeated aggressive actions necessary for success within the

video games increases the aggressive actions that are not required for success within the video game.

PURPOSE OF THE STUDY

The purpose of this study is to focus on the amount of time a player engages in goal-oriented aggressive activity in order to determine if this can predict the amount of time the player will engage in non-goal-oriented activity. This study will also investigate the application of social learning theory as it applies to virtual video games.

The majority of studies that address aggression within video games categorize all aggressive behavior as harmful. This neglects the positive aspects of aggression (Vitiello et. al., 1990). More recent studies have noted that aggression within video games can be differentiated (Polman et al. 2006).

This study will look at the hours spent playing World of Warcraft (WOW) and Everquest 1 and 2 (EQ1-2). It will also categorize the aggression during game play as goal-oriented-aggression and non-goal-oriented-aggression. Lastly, this study will test as the time engaged in positive aggressive activity increases, does the time engaged in negative aggressive activity within the game also increase. The premise is if the game teaches aggression, we should see comparative amounts of both types of aggressive behavior. The negative behavior should also increase as the play spends longer hours within the game.

Another purpose of this study is to categorize and quantify non-goal oriented aggressive behaviors of players within the Massively Multiplayer Online Role Playing

Games (MMORPGs) as compared to goal-oriented-aggressive behavior. Non-goal-oriented aggressive activity is the aggression within the video game that does not render positive rewards.

Video games are virtual worlds where the player can choose to engage in positive or negative aggressive activity. For the purposes of this study, positive aggression is identified as aggression necessary to achieve a sanctioned game goal in order to attain a game reward. This is goal-oriented-aggression. Aggression for the sake of malicious behavior that renders no game reward is identified as non-goal-oriented aggression.

If aggression that is planned, organized and encouraged (goal oriented aggression) actually teaches the player non-goal oriented aggression, this behavior would reasonably manifest itself within the game first. Sanctions within the game are far less severe than what is found outside the MMORPGs, making the MMORPGs a prime area for non-goal oriented aggression. There is ample opportunity for a player to kill, annoy and provoke other players. This study will investigate if players actively seek out and engage in non-goal oriented aggression within the game.

SIGNIFICANCE OF THE STUDY

Many studies suggest that aggressive behavior within video games teaches aggressive behavior outside of the video game (Anderson and Murphy 2003; Kirsh et al. 2005). This is based on the premise that since aggression is an intricate part of the video game, it desensitizes the player to violence (Moller and Krahe 2008). Within the field of psychology, aggression is classified so as to differentiate between the positive purposes

of aggression versus aggression that is negative in nature (Vitiello et al. 1990; McEllistrem 2002). Few published sociology studies take advantage of this knowledge thus they fail make the distinction when examining the purpose for aggression within video games. This leads to ineffective and misleading studies of aggressive behavior within video games. There are two logical fallacies in most types of analysis addressing video games. These studies fail to show a causal relationship between playing video games labeled violent and aggressive behavior (Lachlan, Smith, and Tamborini 2005). Nor do they address the fact that there is ample opportunity for non-goal-oriented aggression within the game. No study has analyzed if players that spend time engaged in goal-oriented aggressive behavior increase the time they spend in non-goal-oriented aggressive behavior the longer they play the game.

The importance of this study is to add to the body of literature that comprehensively addresses aggression within video games. This study will begin the process needed to study aggression as two separate phenomena, aggression with a positive outcome and aggression with a negative outcome. This study will investigate whether players that actively participate in sanctioned aggressive activity within MMORPGs also actively engage in unsanctioned aggression, readily available within the same MMORPGs. The primary purpose of this study is to investigate the popular notion that playing video games can encourage or teach aggression in gamers and to see if this concept is empirically substantiated.

Another important point of this study is to challenge the conclusions of studies that, without a doubt, state video games teach violence. This study will analyze the methods of the other contradictory studies. The field of sociology readily seems to accept popular wisdom rather than empirical data. These myths and urban legends about video games are being used to influence public opinion and eventually public policy.

Furthermore, many studies neglect to follow the ESRB's suggestions for age appropriateness. Games with violent or aggressive behavior are clearly outlined as inappropriate for children and young teens. Yet, many of these studies use young children for their research in aggression, ignoring the data that states the average age of a MMORPG gamer is 30 or older in some accounts. The Center of Disease control (CDC) noted the average age of a video game player was 30 years old in 2005 (CDC 2007). The ESA's 2010 data has the average age of video game players as 35 years old (ESA 2010). This study is significant because it will examine the aggressive behaviors of age appropriate video game players.

Another significance of this study is that it will join the body of work that analyzes aggression from the perspective of a gamer. The evaluator is a large part of determining how the aggression will be categorized (Bandura 1973). Lachlan and Maloney (2008) conclude that the intricacies of video game play need to be investigated with a deeper understanding of the video game "... understanding video game content may be a much more complicated task than previously thought" (p. 295). It would be impossible to differentiate between goal oriented aggression (predatory aggression) and

non goal oriented aggression (affective aggression) without experience or a comprehensive understanding of playing the game (Vitiello et. al. 1990). Without personal experience, all aggression within the game appears negative (Anderson and Murphy 2003; Polman et. al. 2008; Moller and Krahe 2009).

DEFINITIONS

There are many terms used throughout this study that need to be defined, beginning with the concept of aggression. Aggression is a complex behavior that may have many different motivations (Lachlan et al. 2005). To Albert Bandura (1973), “aggression is characterized as injurious and destructive behavior that is socially defined as aggressive behavior.” For the purpose of this study, aggression is defined as any behavior within the video game that aggravates, annoys or provokes other players, in situations where there is no game-defined goal. Non-goal oriented aggression is injurious behavior towards the virtual representation of a player within a MMORPG, with the intent or purpose to kill, annoy or provoke the other player, in accordance with previous subtypes of aggression (Bandura 1973; Vitiello et. al. 1990). Additionally, non-goal oriented aggression will not render any game rewards. It is not aggression required for dueling (aggression for the sake of sport) nor is it aggression that is rewarded within the video game. For this study, the non-goal oriented aggression variables identified are: kill, annoy, and provoke. These variables collect data on the player’s habits and specifically measure non-goal oriented aggression.

Goal-oriented aggression is the predatory aggression that is planned and calculated to attain a goal (Vitiello et. al. 1990). This aggression is part of the game design and is desirable as it assists the player in “leveling up” their character (Ducheneaut and Moore 2005). Goal-oriented aggression is the aggression needed in order to successfully navigate the various levels of the MMORPGs. This is accomplished by the player completing various quests. Goal oriented aggression will render game rewards.

A quest is a task of valor designed within the game. These quests require that the player challenge and become victorious in battle over an enemy of the player’s chosen alliance. It is a task that yields a positive reward (IGN Entertainment 2010).

The new generation of online games is often referred to as MMORPG. A gamer is a person who plays video games. A character is an avatar, a virtual representation of a player, designed for the purpose of playing the game. The character can be modified to reflect the player’s preference for skin and hair color, hair style, sex, along with race or species (Young 2009). Furthermore, games such as WoW allow the player to also choose from a limited amount of body piercings.

A game boss is a major enemy within the game. Bosses can be found at the end of game quests. The higher the level of the avatar, the more difficult the boss is to defeat. The last boss of the game is known as the final boss. Defeating lower level bosses leads up to defeating the final boss, a task when completed is considered winning the game. A NPC is a non-player character. They are characters that are programmed into the game and controlled by the computer (Haney 2006).

Leveling within the game refers to a player gaining experience by completing various quests designed within the game. “XP” refers to experience points, the points awarded when quests are successfully completed (Haney 2006). Another method for gaining experience is called grinding. This means the player performs mindlessly repetitive tasks, such as killing monsters, in order to level up or proceed in the game.

Killing within MMORPGs means to attack a character until all the health of that character is gone. This can be done with virtual weapons, virtual physical combat or a combination of both. “Killing” another player is simply a way of saying the foe has been defeated. Health and death, within MMORPGs refers to the measure or number indicating the amount of damage a character can receive before the character is defeated. It is also an indicator of how close that character is to death. Within the game, there is no finality to death. The character is simply depleted of all health and must then begin again at designated position within the game design (Haney 2006). For example, in WOW, a player resurrects (a process of beginning again) in various graveyards, or a player can run their character from the designated resurrection location to their character’s body location and resurrect there. The character does not lose experience but will resurrect with a diminished amount of health points.

A raid is an intensive quest that could last hours. It is also called a dungeon. This is a quest that requires a group of cooperative players in order to complete. A raid requires aggression as a tool to be successful, with the goal of defeating a game boss.

ESRB stands for Entertainment Software Rating Board. This is the game rating system established by the developers of video games. These ratings let parents know the age appropriateness of the game.

ORGANIZATION OF THE DISSERTATION

Following this introduction, chapter two reviews the literature. This review includes studies that claim video games teach aggressive behavior and studies that refute that claim. Also included are studies that were inconclusive. Chapter three outlines the new theory proposed in this study addressing video games and aggression. That discussion is followed by the hypothesis for this research. Chapter four describes data used in this study and the methods used for analysis. Chapter five presents the findings of this research, including descriptive statistics and results of hypothesis testing. The conclusion chapter summarizes the findings, discusses their implications and limitations, and points to the directions for future studies.

CHAPTER II

REVIEW OF THE LITERATURE

INTRODUCTION

This chapter offers a review of articles addressing the debate on whether video games teach aggression or not. It will also cover the literature that had inconclusive findings. There is a very large body of literature that concentrates on aggressive behavior and playing MMORPGs. However, no literature exists that delves into unnecessary aggression within the video game. This review found that the existing literature on aggression and video games falls into three basic categories. One group of articles supports the concept that video games teach aggressive behavior, and they have empirical and pseudo empirical data that seems to support that assertion. The next group states that video games teach aggressive behavior, but their data does not support that position. The last group claims that video games do not teach aggressive behavior and has data to support that perspective. Each group thoroughly convinced that their position is the only valid one.

A letter from the National Coalition Against Censorship to the president of the American Academy of Pediatrics on the topic of empirical studies supporting the concept that media teaches violence stated:

It is not true, for example, that "more than 3500 research studies have examined the association between media violence and violent behavior

[and] all but 18 have shown a positive relationship." The source you cite for this assertion, ex-Lieutenant Colonel Dave Grossman's Teaching Our Kids to Kill, is not a scholarly work, nor does your Statement even transcribe Grossman's claims accurately. In fact, there are probably fewer than 300 empirical studies that try to measure the effects of violent media - with uneven and ambiguous results. (NCAC 2001)

This letter was signed by: Marjorie Heins, Free Expression Policy Project, Professor Jib Fowles, University of Houston, Professor Henry Giroux, Pennsylvania State University, Professor Jeffrey Goldstein, University of Utrecht, The Netherlands, Professor Robert Horwitz, University of California - San Diego, Professor Henry Jenkins, Massachusetts Institute of Technology, Professor Vivian Sobchack, University of California - Los Angeles, Michael Males, Justice Policy Institute, Center on Juvenile and Criminal Justice Richard Rhodes, Science Historian, Pulitzer Prize Laureate, Christopher Finan, American Booksellers Foundation for Free Expression, David Greene, First Amendment Project.

This has not, however, deterred many studies that have attempted to draw a connection (either empirically or through meta-analysis) between video games and aggressive behavior. The following studies believe their work proves this connection.

VIDEO GAMES TEACH AGGRESSION: SUPPORTING STUDIES

Bowie Kotrla (2007) Arriaga et al. (2006) and many others all state emphatically that a greater exposure to media violence increases aggressive attitudes. This article claims that this conclusion can be traced all the way back to Plato. Kotrla and Arriaga then supports this conclusion with the work of Craig Anderson and his colleagues alone,

whose work is based on meta-analysis and is methodologically flawed. There was no indication that more research was conducted to consider any alternative conclusions.

The study conducted by Lachlan, Smith and Tamborini (2005) concluded that avatars that have aggressive or violent attributes are attractive to some gamers. Also, violent avatars tend to inspire more aggressive game play. This study is important because it analyzes the purpose for aggression within the video game. Aggression is recognized as a complex behavior and can be motivated by multiple goals. Positive aggression entails protection of life, property or personal gain. Negative aggression involves anger or retaliation. In this study positive aggression is categorized as justified, whereas negative aggression is considered unjustified. This study also found that if the player perceived their avatar as “good” it was less likely to engage in unjustified aggression. The flaw is in the conclusion that states “people imitate the characters they find attractive (p. 326).” The avatar is not a sentient being, it is a digital representation controlled by the will of the people who created it. A gamer is not influenced by the puppet, but is in fact, the puppet-master.

Arguing that repeated video game play desensitizes the player to real world violence, Carnagey, Anderson and Bushman (2006) offer empirical data supporting their conclusion. In this study, desensitization meant a decrease in physiological arousal. There were 257 college students participating in this study. The study required the participant to play a violent video game for 20 minutes and then watch a video with real world violence. The players were monitored for heart rate. This study did support that

after playing the video game, respondents had a lesser physical response watching real life violence. Likewise, the 2009 study by Fanti et al. determined that desensitization does occur after playing violent video games. Neither of these studies draws a connection between playing violent video games and aggressive behavior. The concept that people will shut down when subjected to over stimulus is not revolutionary. In 1903 Georg Simmel wrote;

“ . . . Thus the metropolitan type – which naturally takes on a thousand individual modifications – creates a protective organ for itself against the profound disruption. . . Instead of reacting emotionally, the metropolitan type reacts primarily in a rational in a rational manner. . .” (Levine 1971).

In order to survive the stimuli of life inundated with ‘*profound disruption*’ the natural tendency is to turn off emotion and react rationally. It was only natural for the respondents in this study to stop reacting emotionally and therefore they would not have a physical response to violence after repeated exposure to it. That does not, however, translate to a learning process or a general acceptance that aggression or violence is socially acceptable.

Polman, de Castro, and van Aken (2008) tout that “playing a violent video game should lead to more aggression than watching television violence” (p.256). This study had 57 boys and girls ages 10 to 13. This study found no significant correlation between the frequency of playing video games and violent behavior on the playground. However,

the boys tended to prefer playing the aggressive video games more than the girls in the study. Again, other factors could be in play other than the video game.

Moreover, Polman Castro, and van Aken (2008) stated that players are rewarded for their acts of aggression. This is a common mistake made by those ignorant of the rudiments of video games. The rewards are not for the acts of aggression but rewards for the acts of valor, when the player defeats an enemy. The Polman et al. study also did not take into consideration the natural propensity that could influence the aggressive behavior of the participants. Lastly, the ages of the participants were too young according to the guidelines established by the ESRB and not representative of the average video game player that fluctuates by study respondents but is in the range of 27 to 34.

A study conducted by Möller and Krahé (2009) began with 295 German adolescents ages 13 – 16 in a longitudinal study. This study categorized the level of aggression that was intrinsic to the video game being played. They also took into account the time spent playing the video game. These researchers found it impossible for long term comparison, to create a cohort group of gamers playing the same video game, as the games of preference of the respondents had changed over the 30-month investigation. The final number for comparison was 143, less than half of the participants used for the baseline. The findings of this study appeared to show an increase in game play influenced an increase in aggressive attitudes. However, there are methodological concerns with this study. First, the researchers did not follow the ESRB's guidelines for age appropriateness for aggressive video games. This study did not address the

participant's propensity for aggression. Additionally, when comparing the larger beginning group with the final smaller group the researcher's did not weigh the findings to reflect the lower number of participants in the second test group.

There is also the work by Lt. Col. Dave Grossman calling for action against media violence on TV, movies and video games. Lt. Col. Grossman's (1999) book suggests that the increase in crime in recent decades (1950-2000) is directly related to violence in the media. This work suggests that media violence desensitizes views to violence and increases the level of fear in children. Grossman suggests that violent media content affects an area of the brain and coins a term "Acquired Violence Immune Deficiency Syndrome" (p. 64). Grossman further suggests (without empirical data) that children exposed to violent media content will suffer from this syndrome. This study also ignores the data offered by the Office of Juvenile Justice, Department of Justice statistics that show a decreasing trend in juvenile crime (U.S. Dept. of Justice 2009).

There are of course, other studies that contend that video games teach aggression. The methods used for those studies mirror the methods in the studies reported here. The findings represent the same view that the longer a player engages in video game play, the more likely they are to act out aggressively outside of the virtual world.

VIDEO GAMES TEACH AGGRESSION: NO EMPIRICAL SUPPORT

The next set of studies believes intuitively that there should be a connection between playing violent video games and aggressive behavior. To this set of investigators it seems intuitive that if one plays aggressive or violent video games, the

desensitization process would remove inhibitions, freeing the individual from customary social constraints. Yet at best, as noted by the NCAC, the findings are ambiguous.

First, the Funk et al. (2002) study tested the connection between the preference for playing video games and behavior problems in order to establish an empirical connection between violent video games and aggression. This study consisted of 76 males ages 11 to 24 years old. The conclusions of this study did not show a relationship between playing video games and aggressive behavior. Additionally, the findings of this study did not support the study's hypothesis that a preference for video games is associated with behavioral problems.

Another early study of the effects of playing video games was conducted by Smith, Lachlan and Tamborini (2003). This work addressed the content of violence within games and was inspired by the circumstances surrounding the tragedy of the Columbine High School shootings. This study failed to show a connection between aggressive behavior within video games and aggressive behavior outside of the virtual reality. It did justify the ESRB's decision to rate video games as this study did substantiate that games that are designed for older audiences tend to be more violent than games designed for younger audiences.

Craig Anderson and Christine Murphy (2003) investigated violence and aggressive behavior in young women. Their study included 91 undergraduates divided into groups playing violent video games and games with less aggression designed into the game. Anderson and Murphy state that there is a short term increase in aggressive

behavior for those that played aggressive video games. However, the majority of their findings showed no significant increase in aggressive behavior in the participants. This study did find that immediately after playing the video game, female players of the aggressive video games were more inclined to seek revenge. Again, the purpose of the game was designed in a boxing match fashion where the player is motivated to 'beat' their opponent in a match. The intrinsic basis for fighting games is competitive. Aggression maybe the only means for success, however, the study did not address if aggression was the only activity used to retaliate in the real world.

Dr. Craig Anderson, Director for the Center for the Study of Violence has produced many studies using meta-analysis to determine that video games have a direct connection with aggressive behavior outside the virtual world. Dr. Anderson and colleagues defend their expertise in meta-analysis investigation in a recent bulletin published by the American Psychological Association in 2010 (Anderson et al. 2010). It is not the ability of the researchers that comes into question when doubting the findings of any study based in meta-analysis. Meta- analysis is research that statistically combines the results of several studies that share a hypothesis. There is no doubt that one may find a place for meta-analysis in quantitative studies, but there is no theoretical support or empirical data by which meta-analytical studies can prove causation from the hypothesis to the results. From publication to researcher bias, the meta-analytical approach is a showcase of the studies chosen by the researcher or research team. Meta-analysis has no way to insure that the researchers conducting the meta-analysis share the same definitions

when combining terms among the studies they wish to amalgamate. There is no standardization of the definition of aggression, which makes meta-analysis problematic at best (Ferguson and Kilburn 2010). Additionally, if one is attempting to quantify the results of magazine articles, then the unit of analysis, the sample being studied is the article findings. Findings can only be extrapolated to the population of the sample. As stated earlier, the findings cannot be combined as there is no way to insure that the conceptualization process in each study used the exact same definitions. In short, the meta-analytical studies study articles then make predictions about people. At best, meta-analysis can only be used to predict the *ratio of articles* that claim entertainment teaches aggression as compared to the number of articles that deny entertainment teaches aggression. This information could be useful in the beginning process of a study but not as the end result.

Dr. Anderson also generously offers a tool designed to measure aggression (Anderson and Ford 1986; Anderson and Morrow 1995; Anderson and Dill 2000). This tool demonstrates the lack of understanding of video game design and flaws in the conceptualization of the research. For example, one question asks “How violent is the content in Myst?” Myst is an adventure game where the player collects clues and solves puzzles. There are no challenges that require defeating a foe, therefore no need for aggressive activity.

Additionally, the tool does not explain how violence is defined (see Exhibit A in Appendix). This is repeated in the tool created by Anderson and Dill, asking the

respondent how violent the game is or if the game was “bloody/gory”, without providing any definition as if these terms are self-explanatory (Anderson and Dill 1999).

Aggression for honor and glory is seldom considered in the context of violence, but a necessary means to reach an intended goal. In addition, neither questionnaire asks if the player engages in aggressive activity outside of the game; however this did not prevent this crew of researchers from making that assumption and presenting as fact that video games teach aggression (Anderson and Dill 2000; Anderson et al. 2004).

Arriaga et al. (2006) investigated the short term effects on the gamers’ level of hostility and anxiety after playing violent computer games. This study consisted of 97 undergraduate students whose ages ranged from 18 to 25 years old. This was a self-reported questionnaire designed to discover the participant’s video game habits and reactions after game play in addition to collecting data of changes in heart rate and skin conditions. As expected, initially there were changes in the physiological response of the respondent. But the study offers no support that this response translates to activity outside of the video game. Many of the findings in this study were insignificant with the exception that males and females reacted differently to stimuli.

Further, Arriaga et al. (2008) investigated short-term aggressive behavior of 148 Portuguese college students, after playing video games. This was an age-appropriate group with an age range of 18 – 46. This study was designed to study the short term effects of playing video games and the instigation of aggression. The findings of this study did not support that hypothesis. This group expected to find that aggression

increased with playing virtual reality games. However, this was not the final conclusion. Arriaga et al. found no direct aggressive effect could be identified. Even with their data contradicting the desired conclusion, they still felt that their tests established an indirect effect between hostility and playing virtual reality video games.

Although Nowak, Kremer and Farrar (2008) state with certainty that playing video games and becoming emotionally vested in the game, will influence the player's propensity to engage in violent behavior. Yet, this study also stated with a certainty that there is no direct link between game use and aggression. This study does state that the more involvement the gamer has vested in playing the game, the more the likelihood that the gamer will experience levels of frustration or aggression.

VIDEO GAMES DO NOT TEACH AGGRESSION

This last group accepts the science that supports that no direct connection has been made between playing violent video games and aggression in the "real" world. From very early studies to a 1.5 million dollar federally funded study, these researchers did not find any direct connection between virtual violence and real world aggression. One scenario that emerged is that people with aggressive propensities are drawn to violent video games. This is the only group of studies that included participant observation studies, giving the researchers firsthand knowledge of video games.

As early as 2004 Matthias Rauterberg (2004) conducted a study that challenges the concept that violent video games teach aggressive behavior. This study concludes

that playing video games encourages literacy, thinking, reflection and creativity. In addition, game play encourages collaboration and pro-social behavior.

Ducheneaut and Moore (2005) conducted a participant observation study of the MMORPG Everquest. Both researchers engaged in the activities of the game to analyze what a player learns as they play MMORPGs. Their observations show that the game design encourages players to coordinate and cooperate with others. The pair noted that there is a strategy to player grouping to take advantage of the various skills of other player's characters. Forming these groups requires players to meet and interact with other players, building a network within the game. Players also learn leadership qualities and to be considerate of the needs of other players. This analysis from the perspective of the player discovered that MMORPGs are not endless exercises in mindless killing.

Similarly, Michele Dickey (2006) published a content analysis of the purpose of MMORPG design. Dickey outlines the motivation that is intrinsic in video game design. MMORPGs offer the player a variety of choices, control, collaboration, challenges and achievement. Additionally, this content analysis details the strategic elements of playing MMORPGs. From the importance of good avatar character design to the strategy in group coalition, this article focuses on the skills a player learns from the design of video games. By successfully completing quests either alone or as a group, video games teach players to work together, to pool their strengths and assist other players towards winning the game.

Crawford and Gosling (2009) took a subsample of interviews collected from 65 of the 82 gamers in the study. Participants were undergraduate students. These interviews discovered that gamers are attracted to the games for the opportunity to vicariously experience the life and opportunities one would never have in reality. The games also afforded opportunities for the player to interact with other players. This study did not focus on the aggression needed to play games such as football, but the escape the games offers the “average Joe” as they navigate their team to championships.

In an unpublished paper by Michael Ward (2008) there was a search for a connection between playing video games and aggressive behavior. This study compared crime rates to the number of video games sold in a year. The general comparison of the crime rate to video games sold did not show that video games increased aggressive behavior. The findings of this study show that as the popularity of video games grew, the crime rate decreased.

In 2004 the directors of the Harvard Medical School Center for Mental Health and Media, were given a 1.5 million dollar grant to study the effects of video games, they titled “Grand Theft Childhood”. Researchers Kutner and Olson (2008) begin their book by addressing the studies, myths and research connecting aggressive behavior and video games as being “drawn from bad or irrelevant research, muddleheaded thinking and unfounded, simplistic news reports . . .” (p. 8). The Kutner and Olson book notes that historically, literature written since the mid-1800s has been accused of being violent media and a danger to youth. From books to movies to television, as the technology

changes the old popular fears re-immerge. Video games are simply the latest form of technology to inspire this fear.

The participants “Grand Theft Childhood” were 1254 seventh and eighth grade students in Pennsylvania and South Carolina. The video games played by these children included games that are not age appropriate for this age group, such as “Grand Theft Auto” which is clearly inappropriate for audiences under 17. This game is rated “M” for mature audiences. The package is clearly marked containing content of blood and gore, intense violence, nudity, strong language, strong sexual content and the use of drugs and alcohol. It is an unfortunate reality of video games that researchers (and parents) are woefully unaware of the ESRB rating system and often give their children games which are not age appropriate. This study investigates the connection between the real world aggressive activities of children, such as fighting or bullying another child and aggressive video games.

Yet even with inappropriate video games taken into consideration, this study brings into question the assumption that the games teach aggression. The findings show that aggressive children had that propensity before playing the video game and are drawn to the game by that propensity. Also, the majority of children that play video games, do not engage in socially inappropriate aggression outside the virtual world. When searching for what draws children to video games, this study found that “both boys and girls find inspiration, joy and relief in video games” (p. 112).

CONCLUSION

"The studies do not find that video games have ever caused anyone to commit a violent act, as opposed to feeling aggressive, or have caused an average level of violence to increase anywhere." Judge Richard Allen Posner

Many studies rely upon the short term effect of aggression following playing some video games to prove that video games inspire or teach aggression in the real world. Many of the studies, not having the benefit of understanding the video game, come to reasonable but erroneous conclusions. Regarding work such as the book written by Lt. Col. Dave Grossman, the National Coalition Against Censorship states these opinions deserve our respect, but should not be confused with scientific evidence (Heins et al. 2001).

Studies such as this one are important as it emerges not only from an understanding of video games, but addresses aggression within its place of origin, the video game. Understanding the purpose of aggression places a new light on what is considered aggressive for the sake of aggression and what is calculated aggression for the purpose of attaining a specified goal. It is of small wonder that lacking that clear distinction, studies of video game aggression seems based on the public's assumptions and fears rather than fact. As FBI statistics show a steady decrease in juvenile violence, the public still believes that video games teach and encourage an increase of aggression among its players. According to the FBI's statistics on juvenile violence, schools in the U.S. have seen a substantial decline in homicides. There were 42 homicides in schools both 1992 and 1993. However by 2008 and 2009 there was only one homicide in U.S.

Schools both years. The overall trend of juvenile violence has been decreasing during this time frame. This downward trend is largely ignored during periods of highly publicized school shootings (Virginia Youth Violence Project 2009).

The debate over the concept that video games teach or encourage violent behavior rages on, with proponents on both sides believing their position is correct. It is doubtful that any one definitive study will settle the debate. However, as more studies emerge there is some hope that science will outweigh intuitive fears.

CHAPTER III

A VIRTUAL GAME THEORY

“[Theories] must accurately identify the determinants of human behavior as well as the intervening mechanism responsible for the changes.” Albert Bandura

Sociological theory is unique in the fact that it is not constant. In the field of physics, to our technological capabilities, the speed of light does not change. In chemistry, two hydrogen molecules when combined with one oxygen molecule will result in water. But social theory, in order to be effective, must evolve and change with society. Thus, for the basis of this study two existing theories, differential association theory and social learning theory, are being amalgamated, enhanced and morphed into a theory needed to understand the social phenomenon that has evolved with the introduction of virtual video games.

This treatise begins with a review of existing theories relevant to video game aggression. This will be followed by an outline and explanation of virtual game theory. The amalgamation of the existing theories will provide theoretical support that video games do not teach players aggressive activity and are the grounds for the theory proposed in this study, “Virtual Game Theory”. Lastly, the proposed hypothesis for this study will be presented.

THEORETICAL PARADIGM: SYMBOLIC INTERACTIONISM

As technology becomes a more intricate part of everyone's daily life, there is a great need for sociological theory to explain the impact of the social phenomenon that accompanies the use of technology. Theories of the past could not fathom the intricacy of social interaction within a virtual world. The impact of video games on society is a phenomenon begging for sociological explanation.

A theoretical paradigm is the general framework or guideline for sociological theory whereas sociological theory is developed or emerges from the general umbrella of a specific paradigm. Sociological theories are specific statements explaining how and why social phenomena are related (Macionis 2003). The paradigm is a guideline for the theories it produces. However a theory gives an explanation of the social phenomenon. This study supports new theory that addresses virtual reality.

This dissertation proposes a new theory under the umbrella of the symbolic interaction with strong influence of conflict paradigm. The theory proposed here is an amalgamation of several different theories of aggression designed to explain behavior within virtual video games. Video games are played in a very large area, millions worldwide playing within the same virtual world map simultaneously. However, the interaction within the video game is not collective behavior. The interaction is primarily small groups or individuals, requiring a close, focused analysis. Therefore, theory that addresses virtual interaction must be the micro-level theory paradigm of symbolic interaction.

Symbolic Interactionism rests on three premises. The first one is that people act or react towards a thing on the basis of the meanings we have attached to the thing. This means that all that we are and all that we do, has some attached meaning that someone may interpret. The second premise builds upon the first; the meaning of things is a result of social interaction with others. This leaves the arena of interpretation varied. Lastly, these meanings are influenced by interpretive process of the person. This paradigm gives us the framework to interpret the meanings of things, actions or reactions. Meanings become a social product and a unit for analysis (Blumer 1969).

DIFFERENTIAL ASSOCIATION THEORY

“Obviously, it is not the conditions or traits themselves which cause crime, for the conditions are sometimes present when criminology does not occur. . .” Sutherland and Cressey

Differential association theory states that criminal behavior is learned from others within a person’s intimate primary associations (Sutherland and Cressey 1974). This theory is limited to criminal behavior but it gives us the insight as to how we should understand and analyze aggressive behavior. More specifically, differential association theory outlines a framework for studying criminology that highlights the fallacies in logic when researchers attempt to conclude that playing video games teaches the player aggressive behavior (Sutherland and Cressey 1974).

For a phenomenon to teach criminal behavior, a researcher must be able to isolate and identify the phenomenon. However, Sutherland and Cressey also point out that for the study to be truly scientific, the research must be able to identify the phenomenon in

criminal behavior and not found elsewhere (Sutherland and Cressey 1974). In other words, if a phenomenon is found in human interaction that *does not* result in criminal behavior, then the researcher is chasing a “red herring”. For example, Cesare Lombroso studied criminal behavior extensively and determined that criminal behavior is not only inherited but can be identified by the individual’s physical traits such as a large jaw and shifty eyes (Lombroso 1911). Lombroso had this to say about the criminal face:

“The Face. In striking contrast to the narrow forehead and low vault of the skull, the face of the criminal, like those of most animals, is of disproportionate size, a phenomenon intimately connected with the greater development of the senses as compared with that of the nervous centres. Prognathism, the projection of the lower portion of the face beyond the forehead, is found in 45.7% of criminals” (Lombroso 1911).

There are many people in society with large jaws, eyes that some consider shifty or big faces and they do not engage in criminal behavior. In fact, the very definition of these physical features is too subjective to withstand scientific scrutiny.

Differential association would then state that since these physical traits are found in criminals and those who *do not* engage in criminal behavior, we cannot study physical traits in order to explain criminology. Likewise, as some video game players engage in aggressive behavior and others *do not*, we cannot study video games as the source of aggressive behavior (Sutherland and Cressey 1974).

Sutherland and Cressey begin their analysis by stating that criminal behavior must be analyzed using two complementary procedures. The behavior must be analyzed in

terms of the differential levels of analysis isolating both the act and the conditions that are only present with the criminal behavior (Sutherland and Cressey 1974). Differential level of analysis is a process of holding constant the variables believed to teach deviant behavior. This technique requires that we examine the experiences and associations that are pertinent to the phenomenon. In addition, we need to identify conditions that are present with criminal behavior and without criminal behavior, so we can eliminate those conditions as contributors to criminal behavior. When we apply this multi-level technique to understanding aggressive behavior, we find that we cannot isolate playing video games as a factor in contributing to aggressive behavior.

Equally important are the insights provided by differential association theory into the origins of criminal behavior. Criminal behavior is not only learned, but it is learned from intimate associations. So the likelihood of learning criminal behavior from the media is unlikely “. . . this means that the impersonal agencies of communication, such as movies and newspapers, play a relatively unimportant part in the genesis of criminal behavior” (Sutherland and Cressey 1974:75). Video games fall into the same category of entertainment as movies.

Not only is learning of criminal behavior an intimate process, but learning also includes the sharing of the techniques between the individuals who are committing the crime or deviant behavior. This learning process is accompanied with sharing criminal motives, drives, attitudes and the foundations to rationalize the decision to engage in criminal behavior. The criminal behavior, motives and attitudes are often modified by

existing laws. However, an individual becomes criminal when unfavorable legal conditions outweigh favorable legal conditions (Sutherland and Cressey 1974).

Therefore the conditions must be ripe to produce criminal behavior. The deviant or criminal behavior has to have stronger influence over the individual than all other agents of social control such as valued social institutions, societal norms and opposing peer pressures. This also applies to video games as the virtual environment is not strong enough to replace or overshadow family, religion, friendships and all other institutions of which the player is a member and whose values have been incorporated into the players' personality. In order for video games to teach aggressive behavior, the virtual world would need to completely supplant the real world. Learning criminal behavior is not limited to the process of imitation (Sutherland and Cressey 1974). Likewise, the repetition needed to be successful in video games will not be sufficient to teach aggressive behavior. Let's now move on to social learning theory.

SOCIAL LEARNING THEORY

"The value of a theory is ultimately judged by the power of the procedures it generates to effect psychological changes." Albert Bandura

The basic tenants of social learning theory are that we learn by the information we gather, we are motivated by the incentives that result from a chosen action, and the consequences of that action will either reinforce or deter our future engagement in that action (Bandura 1977). In the course of learning we gather information observed from the actions of others, we synthesize this action with our personal experiences and values,

then we perform established and new behaviors. But learning does not stop there; we also gather the responses of others to our behavior to determine if this is a behavior we wish to repeat.

Social learning theory stresses that it is more than mere personal motivation that teaches the individual a behavior. Bandura outlines the processes needed for us to learn and imitate behavior. Learning through modeling the behavior of others requires that we observe what they do, we retain that information, we actively engage in that behavior and finally there is some type of motivation to repeat the behavior (Bandura 1977).

We are able to learn from others and anticipate an outcome if we chose to follow in the behavior of others as we watch or pay attention to their behavior (Bandura 1977). In other words we simply will not blindly follow the actions we see, hear or experience. We evaluate the actions, we may even attempt the actions, but ultimately it is the actions that produce the best individual result which are incorporated into our repertoire of behaviors.

Social learning theory also notes that we do not learn by mere observations. The attentional process of this theory explains that we will pay attention to the behaviors of others (Bandura 1977). We will also learn from some of these actions. For example, we only need to observe a person using a bottle opener once to understand and successfully manipulate the tool. However, this learning process only occurs this quickly in this example because the outcome of the behavior is one that we deem necessary (opening the

bottle). If we observe behavior that does not have such obvious beneficial outcomes, we gather additional information before mimicking the behavior.

We also employ a retention process in observational learning. This is the process of imagery and verbally coding the information we gather from observing the behavior (Bandura 1977). Repeated exposure to visual images will eventually imprint that image in our minds. This allows us to recall that image absent of the physical stimulus that may have occurred simultaneously with the original image. For example, when speaking of a friend, the name may conjure images of the person in our minds (Bandura 1977). The image is associated with a verbal representation. It is important to note, however, that many “behaviors that are learned observationally cannot be easily established by overt enactment because of either social prohibitions or lack of opportunity” (Bandura 1977:26). Again, existing agents of social control mediate how the behavior we learn.

The last component of social learning theory is when we take all the information we have gathered from observation, imagery and verbal coding and translate it into action. This is the motor reproduction aspect of the modeling process and involves creating appropriate actions from all the information we have assimilated (Bandura 1977). Social learning theory distinguishes between the acquisition of knowledge and acting upon that knowledge. People will not blindly act upon every behavior they learn. We are more likely to act upon behavior that renders a positive outcome.

External reinforcement strongly influences the process of learning appropriate behavior. Social learning theory stresses how one will not realize any rewards until the

person conforms with the behavior appropriate to the context or society (Bandura 1977). Within MMORPGs, socially acceptable behavior is reinforced with positive affirmation, designed into the game in the form of direct rewards. The lessons within the MMORPG are not new, but simply reinforcing values that previously exist. The player, their value system and personality will determine what the video game reinforces. The sanctioned rewards within the MMORPG are not for the aggressive activity, but for the honor and valor of successfully defeating the enemy.

THEORIES OF AGGRESSION

“The social learning theory of aggression distinguishes between acquisition of behaviors that have destructive and injurious potential and the factors that determine whether a person will perform what he has learned.” Albert Bandura

There are many theories of aggression. Konrad Lorenz identified aggression as the fight instinct directed towards one's own species (Lorenz 1963). Others have attempted to explain aggression biologically by attributing criminal behavior to an additional Y chromosome (Jacobs, Brunton and Melville 1965). Later work debunked the extra Y theory, determining that the extra Y chromosome is not responsible for heightened aggression in males (Witkin et al. 1976). While the many theories to explain aggression have many valid and not-so-valid tenets, for the purposes of this study I will use the aggression theory as presented by Albert Bandura.

According to Bandura, aggression takes on a three dimensional aspect as it can be understood from the first person perspective, the observation of others and the third

dimension of the environment or the context of the behavior. Aggression is also “powerfully controlled by its consequences” (Bandura 1973:90). This makes aggression a very complex human activity to study.

Bandura’s social learning theory of aggression accepts the fundamental tenets of his more general social learning theory. We observe what others do, we retain that information through imagery and symbols and finally we actively engage in that behavior if there is an incentive to repeat the behavior. There is one distinction, which is noted above, the individual determines if they will employ aggressive behavior (Bandura 1973). Aggression becomes a conscious act. When we observe aggressive behavior we also observe the reaction of others to that behavior. If the behavior encourages a negative response, we are less inclined to repeat that behavior. Therefore learned aggressive behavior tends to accompany a set of learned adverse consequences (Bandura 1973).

Understanding aggressive behavior also requires that we understand the process of labeling that accompanies aggressive behavior. People who choose to engage in aggressive behavior will often find negative labels that we ascribe to personality traits. This labeling process is a function of the aggressive behavior of the actor and the interpretation of those observing (Bandura 1973). When modeling aggressive behavior, we also model the attitudes and values we observe in others that also observe the aggressive behavior. We incorporate this information and use it when modeling similar behavior responses (Bandura 1973). Socially acceptable aggressive responses are learned as we observe the actions of others who view or are inadvertently a part of the aggressive

behavior. This makes aggression not only the behavior of the actor but also the interpretation of those who view the behavior (Bandura 1973). It also acknowledges the fact that people have a higher intelligence with the ability to discern socially acceptable and socially unacceptable behavior, choosing which behavior they will model or repeat.

The third aspect of aggression is the understanding of the context of the act. It is the context that will determine if the behavior is a collective disruption or a legitimate response (Bandura 1973). For example, one may know it is wrong to steal from a store and may have stronger restraints from stealing when in a store when that person is aware that others are watching. However, if that person is in the midst of a disaster such as the earthquake in Haiti, taking food and water for survival from a store is a necessity. The context is the determining factor which mediates the person's behavior.

Bandura's studies note that we can learn aggressive behavior from intimate relationships, such as family behavior (Bandura 1973:93). We can also learn aggressive behavior from our cultural environment (Bandura 1973:97). Cultures that value aggressive behavior tend to teach that behavior to its members. For example there are Polynesian cultures that value warrior behavior and systematically teach young boys to be aggressive (Bandura 1973).

Likewise, cultures that strongly mediate the appropriateness of aggressive behavior tend to diminish aggressive occurrences (Bandura 1973). For example, in American culture we tend to look less favorably on females who engage in physical altercations than males engaged in the same behavior.

Bandura also noted that television has the capability of instilling ideas of aggressive behavior. He cites the example of the week following the televising of a show that involved blowing up a transcontinental airliner, when there was an increase of anonymous bomb threats to airports (Bandura 1973). This phenomenon was repeated when the show was aired in other countries. Aggression has an element of contagion theory, the actor feeling freer to act upon unsanctioned aggressive behavior when cloaked in anonymity, such as the anonymous bomb threats. However, it should be noted that *none* of these threats were acted upon.

Aggression therefore is not the chaotic, indiscriminate response to outside stimuli. “People rarely aggress in blind, indiscriminate ways. Rather, aggressive actions tend to occur at certain times, in certain settings, toward certain objects or individuals, and in response to certain forms of provocation” (Bandura 1973:115). The most common occurrences of aggression are found when the actor is provoked (Bandura 1973).

With MMORPGs it is necessary to take into consideration the context of the aggression in order to understand how it mitigates behavior. Many people have attempted to analyze violent behavior within the game without a full understanding of the context of that behavior. Killing within the game is all labeled as negative aggressive acts, when that is not the case. Some of these same people may glorify combat heroism while labeling those who are conscientious objectors to war as unpatriotic (Bandura 1973). Behavior within the MMORPG that is customarily ascribed to aggression is really combative strategy.

When Albert Bandura conducted his studies and investigation into aggression, he had no inkling of how technology would affect our lives. At that time, he felt there was no need to classify aggression. In fact, his writings implied that if you classified aggression into positive and negative aggression, then all aggression could be viewed as positive, in the right situations.

If aggression is restricted to behavior that is performed solely for the purpose of injuring others, then a wide range of activities that are commonly judged as aggressive, including some of the most violent forms of interpersonal assault, would be excluded from consideration. . . . The differentiation generally conveys the impression that aggressive behavior performed for rewarding outcomes represents a form of pseudoaggression relegated to the subsidiary status of a means to other ends. According to this valuation, the holocaust in Hiroshima, which was ordered to force a quick end to war, would represent a mere instrumental act. So would any act of war, for that matter (Bandura 1973:3).

In other words, any action that causes personal injury or the destruction of property is an act of aggression. But Bandura also gives us another level of understanding to our perspective on aggression. In order to fully comprehend the larger context of aggression, we must consider the acts and how *society judges* these acts.

One important deviation this study makes is in opposition to Bandura's statement that aggression should not be labeled according to its purpose. As Bandura rightfully noted in the early 1970's there was no place a person could express aggressive behavior without human consequence. Thus, even if the aggression was an act of defense, such as protecting one's family from an intruder by use of a gun or fighting in self-defense, Bandura's position is that these acts are still acts of aggression (Bandura 1973). Current

studies on the impact of video games often take this position. However, no one has considered the virtual reality aspect of MMORPGs.

In the virtual world there is no way to physically injure the player or permanently damage property. Therefore, aggression within the virtual world must be analyzed within its unique environment, one devoid of damages. Aggression can be analyzed according to the intent, goals or rewards the acts will provide. In the virtual world, the intent of the act carries more meaning than whether the act damaged another.

VIRTUAL GAME THEORY

The purpose for formulating theories about video games is because society attributes playing video games as a *cause* of aggressive behavior. It is imperative that we study whether a significant relationship exists between video games and aggression when attempting to understand the role video games in teaching aggressive behavior. As Sutherland and Cressey noted in this example:

A motion picture several years ago showed two boys engaged in a minor theft; they ran when they were discovered; one boy had longer legs, escaped, and became a priest; the other had shorter legs, was caught, committed to a reformatory, and became a gangster. In this comparison, the boy who became a criminal was differentiated from the one who did not become a criminal by the length of his legs. But “length of legs” need not be considered in a criminology theory, for there is no significant relationship between criminality and length of legs. . . (Sutherland and Cressey 1974:73-74).

Studying video games as the cause of aggression could be very similar to studying the “length of legs” as a cause of criminality. Therefore it is vital to determine if a

connection exists and if so, create policy that protects youth. If not, we should continue to search for the true causes of aggression.

These theories set the groundwork for virtual game theory proposed by this study. For theory to be effective it must grow and evolve as societies grow and evolve. Virtual reality games are a relatively new form of entertainment and technological advancement. New theories that incorporate this new technology need to be formulated and tested. At the time most existing theories were developed, virtual reality games did not exist. At best, existing theories addressed the medium of television. Virtual reality games are similar to television and movies as the player does watch the behavior as the story unfolds. However, there is a major and significant difference in that the player becomes the focal point of the story. Players are not passively watching as others carry the story line, they are intricate parts and are, in fact a very active participant within the story.

The first tenant of this theory is simple: virtual reality games offer an arena for players to display existing propensities, not to learn new behaviors. The MMORPG does not possess sufficient social power or influence that is needed to supplant existing values or instill new values. This tenant is supported by past theories. Differential association theory notes that criminal behavior is learned from intimate associations (Sutherland and Cressey 1974). It takes intimate relationships to change a value system. Intimate associations are extremely close relationships. A relationship with this level of intimacy is rarely formed and flourishes *only* within virtual realities. When one engages in a MMORPG intimate behavior is limited to the words used in virtual chatting. According

to Alton Barbour Ph.D. in his book “Louder than Words” words make up only 7 percent of the communication process. Virtual reality chatting may have the ability to open the door for a deeper relationship in other arenas, but the primary goal of the majority of game players’ is being successful within the game, not to form intimate, lasting relationships.

This is further supported by both social learning theory and aggression learning theory. Learning aggression in a social environment is a four-step process. We have to first observe the behavior, we have to interpret that behavior into images and words and we have also to observe the reactions of others (Bandura 1977). Aggression also incorporates one additional step; we have to weigh the consequences of engaging in aggressive behavior against existing social values (Bandura 1973). Video games are not designed to meet these criteria. For example, when a group is engaged in a dungeon, the game does not stop to pay special homage to any one specific kill, as killing is not the goal. The game moves forward when either the group has completed the task successfully or has failed. The behavior and reaction is a collective behavior with the goal of defeating the enemy not engaging in aggressive activity.

In addition, video games lack the all-encompassing power to over-ride societal values and restraints that mediate our aggressive behavior. As Bandura stated, aggression carries with it a set of societal restraints or encouragements (Bandura 1973). In order for the player to learn real-world aggressive behavior, the model must be able to overcome these societal restraints.

Sigmund Freud identified the aggressive cruelty of humanity as innate. Humans don't learn to be aggressive. To the contrary, it seems to be a constant battle to deny that aspect of our humanity.

The bit of truth behind all this – one so eagerly denied – is that men are not gentle, friendly creatures wishing for love, who simply defend themselves if attacked, but that a powerful measure of desire for aggression has to be reckoned as a part of their instinctual endowment (Freud [1930] 1994:40).

The aggression lives within the individual, simply waiting for the opportunity or circumstance to manifest itself.

There is also the element of the game design and the purpose of aggression within the MMORPGs. In most virtual reality games where the player engages in aggressive behavior, the purpose of that behavior is honor. Just as a society values and admires combative strategy and success in war, so does the design of many MMORPGs. The MMORPGs, which are at the heart of this research, reward players who conduct themselves honorably in battle. Players are not rewarded for malicious aggressive behavior that annoys, provokes or irritates other players.

The second tenet of virtual game theory is: behavior of individuals within virtual reality games is a reflection of the existing value system of the player and does not teach new behaviors. According to social learning theory we will not learn from simple repetition (Bandura 1977). MMORPGs are very repetitive, with very vivid images. We bring to the video game a set of pre-existing values that are not easily dissuaded. If the

player's intent is to engage in non-goal oriented aggressive activity, those are the values that player brings to the game. Investigating the game instead of the player's value system, experiences and internalized societal restraints could be chasing a "red herring".

The final tenet of virtual game theory is that virtual reality games afford the opportunity to be a hero or to indulge in the guilty pleasure of breaking rules without serious social consequences either within the game or in the real world. However, testing this tenet is beyond the scope of this study.

HYPOTHESES

The hypotheses for this study are based on virtual game theory. The first premise for this theory is aggression within virtual reality games must be analyzed according to the intent and goals of the player. There are no damages; therefore, the only measurable concept would be the player's intent for the action. The second premise is that virtual reality games cannot teach deviant aggression. That behavior can only be learned from others that have close personal contact with the person (Bandura 1973). MMORPGs are not only separated by metaphysical dimensions (real versus virtual worlds), players maybe separated by continents, culture or language barriers. The third premise is that mere repetition will not supplant a player's core values. Repetitive virtual aggressive behavior does not translate into aggressive behavior in the "real" world. Lastly, the virtual world is an arena for the player to manifest their propensities.

The general hypothesis to be tested is that playing an MMORPG, a goal-oriented aggressive activity, continuously for long hours has no significant effect on non-goal-

oriented aggressive activities such as killing, annoying, and provoking (KAP).

Statistically speaking, this is a null hypothesis. This study will investigate and compare the hours engaged in positive aggressive activity to see if there is an increase in non-goal oriented activity.

It only stands to reason that if the video game is powerful enough to override existing societal restraints on aggression, then we should clearly see an increase in non-goal-oriented aggressive behavior within the video game initially. As Sutherland and Cressey noted, if a characteristic is truly the cause of criminal behavior, we will find that characteristic only within the criminal and not law abiding citizenry (Sutherland and Cressey 1974). Extrapolating that point, if an action teaches aggression, we should be able to statistically substantiate an increase of aggression, the longer a player engages in the activity.

Additionally, since there are two measurements of playing MMORPGs continuously for long hours, I will also test the following two specific hypotheses: Playing an MMORPG, in a goal-oriented aggressive activity continuously for eight hours in a raid will not significantly increase non-goal oriented aggressive activities such as KAP in video game players. Playing an MMORPG, a goal-oriented aggressive activity, continuously for 10 hours will not significantly increase non-goal oriented aggressive activities such as KAP in video game players. Again, these hypotheses are formatted statistically as null hypotheses.

This research is designed to investigate the impact of video gaming on the player to support virtual game theory. This study focuses only on the non-goal oriented aggressive behavior of the player within the video game. A basic premise of this study is that a player would engage in non-goal oriented aggressive behavior within the MMORPG first, before demonstrating aggressive behavior in the real world. Researchers often make the leap from the metaphysical world to reality with the assumption that actions within the video game rise above social restraints in reality. However, to my knowledge, no research has investigated if there is an increase of non-goal oriented activity within the video game. Social learning theory notes that when behavior is successful that behavior is reinforced and we will repeat it (Bandura 1977).

CHAPTER IV

DATA AND METHODS

This chapter discusses details of the data set used for this study and the methods used to analyze the data. This chapter begins with a general discussion of the original data set and how the subset for this study was selected. As this is secondary data, the credentials of Dr. Yee, the scientist who collected the original data will also be discussed. The variables are described. Following the description of all variables, the methods for conducting this research is proposed. Lastly, an appropriate sample size is compared with the sample of this study. This is conducted to confirm the sample size of this study is adequate.

Data Set

The data used in this study come from a data set collected via the Internet by Dr. Nick Yee. The original data set has over 3200 respondents and was collected during the time frame of May to July in 2005. Links to online surveys are publicized on the main portals catering to specific games. Respondents from past surveys are also notified of the available surveys. This survey was a multiple choice survey and consists of 61 questions. It took the respondent about 5-10 minutes to complete the entire survey. For the purposes of this study there are only nine questions pertinent to aggressive behavior within the video game.

The original data set contained players of many different MMORPGs. Those that reported they played World of Warcraft (WoW) and Everquest versions I and II (EQ I-II) were selected as these two games meet the criteria for Bandura's definition of aggressive activity (Bandura 1973). These games provide the player with goal-oriented-aggressive activity as an intricate part of attaining a quest or goal. Additionally, if the players chose to, they may also engage in non-goal oriented activities within these three games. Goal-oriented aggression is required of all players by the game design; non-goal-oriented aggressive activity is the option of the individual.

This data set was the result of a self-reported survey administered on the internet by Dr. Yee in the course of his academic endeavors to attain his PhD. His web site, "The Daedalus Project", explores the habits of those that play MMORPGs. Dr. Nick Yee is currently a research scientist for Palo Alto Research Center and has collected data on this topic for over 10 years with over 40,000 respondents to his online surveys.

Dr Yee's credentials are impressive; additionally he has contributed many articles to the pool of growing information on MMORPGs and the people who play them. Dr. Yee received his PhD in communications from Stanford University in 2007. Dr. Yee received a B.A. in Psychology with a concentration in Computer Science from Haverford College in 2001.

The data Dr. Yee has collected from his online research has been cited in: "The Washington Post, CBS, TechWeek, CNET, the Associated Press, Nature.com, the New York Times, and the Wall Street Journal among other news outlets. The work presented

here has also been used as course reading at academic institutions, such as Stanford (History of Computer Game Design), UC Berkeley (Research Topics in HCI), University of Washington (Intro. To New Media), U. Mass (Social Issues in Computing), Loyola New Orleans (Interactive Media), and Haverford College (Foundations of Personality)” (The Daedalus Project: About Me, retrieved on September 4, 2010 from: <http://www.nickyee.com/daedalus/archives/000199.php>).

VARIABLES

This study includes two interval/ratio variables, two nominal variables, three categorical and four dichotomous variables. The interval/ratio variables address age and the number of hours one engages in game play. The nominal variables are gender and choice of game; the categorical variables have five possible choices, which are explained in detail in the following discussion. The dichotomous variables are a series of questions that ask require a yes or no response; again, this is discussed in detail in the following sections.

Dependent Variables

The variables “kill”, “annoy” and “provoke” are non-goal oriented activities that are readily available within the video game. Players that engage in this type of activity do so for the purpose of antagonizing other players. The intent is malicious for the sake of sport. If goal-oriented aggression initiates or teaches non-goal oriented aggressive behavior, reasonably we should see that those who spend the most time playing the game,

also engage in the most non-goal oriented aggression. This is the justification for studying the non-goal oriented aggressive variables.

“Killing” (do you play to dominate or kill other players), “annoy” (do you engage in activities that annoy other players) and “provoke” (how often do you purposefully try to provoke or irritate other players) are ordinal variables with five category choices. For “killing” and “annoy”: “1 =Not enjoyable at all”, “2 = slightly enjoyable”, “3 = moderately enjoyable”, “4 = Very enjoyable” and “5 = tremendously enjoyable”. For “provoke”: “1 = Never”, “2 Seldom”, “3 = Sometimes”, “4 = Often” and “5 = Always”. The gamers self report how often they engage in this non-goal-oriented behavior.

This study combines the three variables that address non-goal-oriented behavior, into one variable that encompasses all non-goal oriented aggressive activity gathered by this survey. The dependent variable for this study is the composite variable composed of the responses for the variables kill, annoy and provoke. The new variable will be called KAP and will consist of categories ranging from 3 to 15 when first combined. The first stage of combining the variables results in categories that consist of: “1-3 = Never/ not enjoyable at all”, “4-6 = Seldom/slightly enjoyable”, “7-9 = Sometimes/moderately enjoyable”, “10-12 = Often/very enjoyable” and “13-15 = Always/tremendously enjoyable”. To maintain consistency, this variable is then recoded back into five categories that encapsulate all possible responses. The resulting variable represents all self-reported non-goal oriented aggressive activity a player self-reports within the

MMORPG. The numbers used for the categories of this variable are considered dummy codes and carry no numerical significance.

Independent Variables

The independent variables for this study are self-reported by the player. The first independent variable is “raid8”. This variable represents the time a player is engaged in an aggressive intensive quest (a raid or dungeon) for eight hours or more. “Raid8” is dichotomous and is recoded into a dummy variable with “no” = “0” and “yes” = “1”. The time spent playing a raid is intensive goal-oriented aggressive activity. The purpose of the raid is to kill all NPCs that stand between the player and the goal of the raid, defeating the level boss.

The variable “hours10” represent continuous hours of game play for ten hours or more. This is also a dichotomous variable that required recoding. This variable was dummy coded (“no = 0” and “yes = 1”). Unlike raid8, hours10 may or may not involve intensive aggressive behavior. The hours a player engages in a MMORPG can be filled with various activities. In order to be successful, a gamer must also maintain their avatar. A player can go to different towns for services, such as buying armor, fixing or upgrading the armor they have already acquired. Players can sit by water and fish, go to a bank, go shopping or just visit with friends. There are NPCs that train the player. Training is the process of improving the avatar’s skill levels. The player may spend time with their guild, exchanging information or making arrangements for a raid. Many hours are spent chatting with others. There are also quests that can be completed that don’t require

killing, such as carrying a note from a NPC in one town to a NPC in a different town.

The towns within the game are shared communal areas where a player is safe from attack from NPCs or enemy factions. This variable alone does not indicate the type of behavior the player is engaged in within the game but can be compared to “raid8” in order to determine the likelihood that this time is spent in intensive goal-oriented aggressive activity.

Since these two measurements of the independent variable are likely to be highly correlated, they will be used in separate regression models to see if longer hours of playing an MMORPG make any difference in KAP.

Control Variables

The control variables for this study are age, gender and hours. Age is an interval ratio variable that ranges from 18 to 81 years old. Gender is a dummy variable with “1” for male and “0” for female. To select cases appropriate for the focus of this test, the data is first imported into OpenOffice Base, a database application. Within Base, the data is queried to render players of WoW and EQI-II ages 18 years or older. Cases with missing gender or age are removed after a visual check. However, all other missing responses are allowed because they are such a small number.

In this study, I use gender as the control variable. This will allow me to examine the effects gender may have on non-goal oriented aggression. The literature supports the concept that aggression in general is different for males and females, with males having the tendency to be more aggressive (Winstock 2010; Burton and Henninger 2009).

“Hours” is an interval-ratio variable representing the hours a player has played an MMORPG with a range from .5 hours to 110 hours per week. The variable “hours” is an interval-ratio variable with 57 different categories that ranges from .5 hours to 110 hours of game play per week. This variable will remain an interval/ratio for the purpose of the multivariate regression analysis.

METHODS

The software program OpenOffice Base was combined with SPSS versions 11 and 16 in order to complete the statistical techniques required for this study. OpenOffice Base was used to select players of WoW and EQI-II ages 18 years and older. The OpenOffice Base query was saved as a table and copied into SPSS. SPSS was then used to explore the data and to finally run the multinomial logistic regression.

Once the data was selected and cleaned, a descriptive profile of the players that participated in the survey was created. In addition, frequency tables were created to help understand the variables in this study. All the variables used in this analysis will be used for this purpose.

To test the hypotheses, this study will use ordinary least squares regression because the dependent variable is a scale with 15 categories. All the assumptions for regression will be checked. The analysis will begin with a baseline model (Model 1) consisting of the control variables only: age, gender and hours. The next model (Model 2) will add the two independent variables. However, if these two independent variables are highly correlated, then one of them will be added to Model 1 one at a time. In this

case, there will be two variants of Model 2 with each of the independent variables individually with the three control variables. The last set of regression models will add interaction terms between the two independent variables and gender to the second set of model(s) to see if the effect of the independent variables on the dependent variable varies between men and women. The effect of interaction between the two independent variables and age may be considered as well. Other diagnostic statistics such as variance inflation factor and tolerance will be used to detect if there are any multicollinearity problems in multiple regression models.

Multicollinearity is the situation of variables that are so highly correlated with each other that it is difficult to come up with reliable estimates of their individual regression coefficients. When two variables are highly correlated, they are measuring the same phenomenon or construct. This situation can cause numerical and statistic problems when trying to find the best fitting model. A statistic known as the Variance Inflation Factor (VIF) will be used to identify multicollinearity. A VIF greater than 10 is considered unacceptable.

Regression analysis will address multiple possible models in order to determine which model explains the largest amount of the variance. Regression is useful when conducting exploratory analysis, causal relationships and prediction (Foster et al. 2006, Moore and McCabe 2006). This particular investigation is an exploratory study: The length of time the gamer engages in goal-oriented aggression is tested to see if there is a relationship between the amount of time spent playing the video game and the player's

preference for non-goal- oriented aggressive activity. This study will not be able to assess causation. This study will however investigate if there is a viable model of prediction between the time spent in a video game and non-goal-oriented aggression.

SAMPLE SIZE

In order to determine if the sample size is adequate, a formula for determining how many responses would be sufficient for mailed surveys was used. The model to determine the sample size is $(Z^2 \times p \times (1-p) / C^2)$. For this study, a 95 percent confidence level was used, which is a Z value of 1.96. “P” is the percentage of expected returns a survey. 70 percent is considered a very good survey response rate (Babbie 2007), so P will equal .7. The confidence interval considered is 5 percent, therefore C = (.05). Using these values for this study renders:

$$1.96^2 \times .7 \times (1 - .7) / .05^2 =$$

$$3.84 \times .7 \times .3 / .0025 =$$

$$.806 / .0025 = 323$$

Only 323 cases would be needed to have an adequate sample size. This data set has 1,872 respondents. This specific study consists of a sample size that is 1,549 (479 percent) cases larger than the minimum sample size required.

This concludes the explanation of the data and the methods that are used to complete this investigation. The next chapter will offer the results of the ordinary least squares regression.

CHAPTER V

FINDINGS

This chapter presents the findings of this study. The descriptions of the data are outlined, as is the demographic information on the gamers that responded to the survey. This is followed by cross-tabulations to help gain a fuller understanding of the relationship between playing the MMORPG in a raid for eight hours or more in a week, playing the MMORPG for 10 hours or more continuously in a week and the player's self-reported non-goal-oriented behavior of killing, annoying or provoking other MMORPG players. This is followed by the preliminary steps for linear regression, a check of the assumptions. After assumptions are verified, the regression results are presented.

DESCRIPTIVE STATISTICS

Descriptive statistics can help give meaning to the data. Normally, this consists appropriately reporting the mean, median or mode, the range and standard deviations of the variables in the research.

The dependent variable KAP is a composite measure based on three variables indicating the player's propensity of killing, annoying and provoking other players within the MMORPG. These three variables are ordinal with a range of 1 to 5, reflecting the gamers' preference for the activity. Table 5.1 shows the percentage distributions of the dependent variable KAP and the three indicators used to form KAP.

When asked if the respondents in this sample if they play the MMORPG for the purpose of killing or dominating other players, most respondents (32.3 percent) in this sample, self-reported that they do not play MMORPGs to dominate or kill the other gamers. Additionally, this activity of killing or dominating other players had the least amount of responses (9.5 percent) of all the respondents in this sample. This pattern of *not* preferring to engage in the non-goal-oriented behavior is repeated throughout this study.

Table 5.1 Non-Goal Oriented Aggression Of Respondents

	1 Never	2 Seldom	3 Sometimes	4 Often	5 Always
Kill					
Frequency	607	477	364	248	179
Percentage	(32.3%)	(25.4%)	(19.4%)	(13.2%)	(9.5%)
Mean	2.42				
Missing Cases	3 (.2%)				
Annoy					
Frequency	1,372	352	98	35	21
Percentage	(73%)	(18.7%)	(5.2%)	(1.9%)	(1.1%)
Mean	1.39				
Provoke					
Frequency	1,231	528	93	23	4
Percentage	(65.5%)	(28.1%)	(4.9%)	(1.2%)	(.2%)
Mean	1.43				
Kap					
Frequency	484	929	373	70	19
Percentage	(25.8%)	(49.4%)	(19.9%)	(3.7%)	(1%)
Mean	2.05				
Missing Percentage	4 (.2%)				

The variable annoy is the respondent's self reported activity of doing things that annoy other players. The most of the respondents in this sample (73 percent) reported that they do not find annoying other players enjoyable at all. Again, it was found that the least amount of respondents self-reported engaging in this non-goal-oriented activity. Only 1.1 percent of the respondents in this sample, reported annoying other players tremendously enjoyable. There is one missing case.

The last variable to capture the respondent's non-goal-oriented activity is "provoke". Respondents were asked how often they intentionally engage in behavior with the intent to provoke other players in the MMORPG. The majority of the participants in this sample stated they never provoke other gamers. Table 5.1 shows that 65.5 percent of the respondents in this sample do not play the MMORPG for the purpose of provoking other players in the MMORPG. Once again, the pattern emerges showing that the non-goal-oriented behavior is the least likely reason for playing the MMORPG. Only .2 percent of the respondents in this sample reported always provoking other gamers in the MMORPG. There are no missing cases.

These three variables are combined to create the non-goal-oriented activity variable for this study kill, annoy or provoke (KAP). As shown in Table 5.1 of all the participants in this sample, 25.8 percent self-reported never engaging in non-goal-oriented activity or did not find non-goal-oriented activity enjoyable. Once again, the pattern of least likely behavior within the MMORPG is engaging in killing, annoying or provoking other players. Table 5.1 shows that only 1 percent of the respondents self-

reported they always engaged in non-goal-oriented activity or found this behavior tremendously enjoyable.

Table 5.2 gives the descriptive information for the independent variable for playing the MMORPG for 10 hours or more in a week, engaging in a raid for eight hours or more in a week and the dependent variable representing the respondent's propensity to kill, annoy or provoke other players. The variable for playing the MMORPG continuously for 10 hours or more and the variable representing if the respondent engages in a raid for eight hours or more in a week, are both dummy coded with "0 = no" and "1 = yes".

Table 5.2 shows that that 33 percent of all the participants in this sample self-reported they *did not* play the MMORPG for 10 hours or more in a week. Table 5.2 also shows that 67 percent of the respondents in this sample *did* play the MMORPG for 10 hours or more continuously within a week. This tells us that of this sample; most of the respondents did spend 10 hours or more playing the MMORPG continuously in a week.

However, the opposite was true of respondents that engaged in a raid for eight hours or more in a week. Of the participants in this sample, most respondents self-reported they did not engage in an aggressively intensive raid for eight hours or more in a week. Table 5.2 shows the average of .74 represents 74 percent of all the participants in this sample *did not* engage in a raid for eight hours or more in a week, while 26 percent of the participants in this sample did engage in a raid for eight hours or more in a week. This tells us that although most respondents in this sample played the MMORPG for 10

hours or more continuously, the majority of this time is not spent engaging in the aggressively intensive raid, but in other pursuits available within the MMORPG.

The average number of hours spent playing the MMORPG was about 25 hours a week. The lowest amount of time spent playing the MMORPG in a week was less than an hour whereas there were others that self-reported playing the MMORPG for 110 hours per week. In addition, for this sample, the youngest participant was 18 years old while the oldest participant was 81 years old. The average age for the respondents in this sample is about 28 years old. The gender mean of .88 indicates that 88 percent of the sample participants are male and 12 percent are female (see Table 5.2).

Table 5.2 Description of Variables

Variable	N	Mean	Min	Max	Std. Deviations
IV					
Hours10 (Dummy)	1,876	.32	-	-	.469
Raid8 (Dummy)	1,872	.74	-	-	.438
Control Variables					
Hours	1,879	24.97	.5	110	.469
Gender (Dummy)	1,879	.88			.319
Males	1,661				
Female	217				
Age	1,879	27.9	18	81	8.2

ASSUMPTIONS OF REGRESSION ANALYSIS

The regression procedure is an appropriate model of the relationship between variables. A linear regression procedure is grounded in a set of assumptions that must be addressed before conducting the regression. To meet these assumptions, statistical

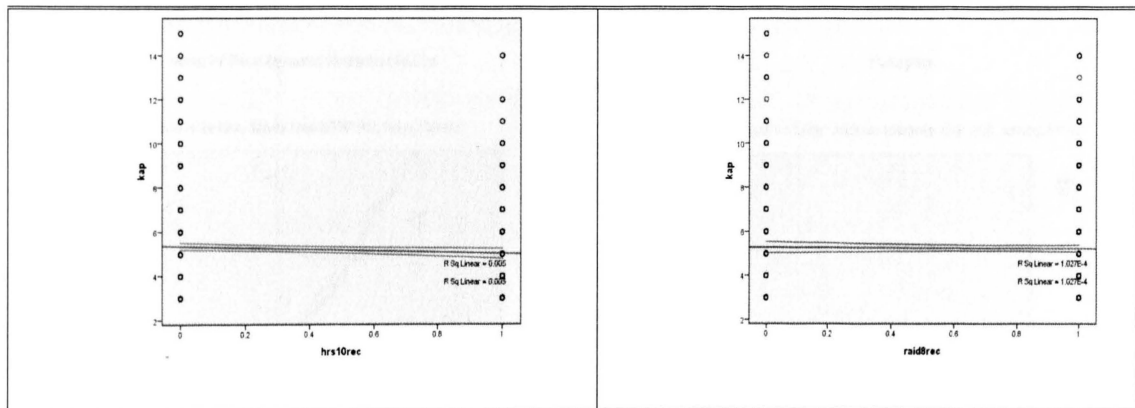
procedures must be conducted. This will also provide information for determining if any of the variables would benefit from being logged transformed.

The data should satisfy the assumption of linearity. The average of the error terms must be independent of the independent variable. The variance of the error term should be constant across the categories of the independent variables (homoscedasticity). The residuals should be normally distributed. All cases in the sample must be independent of each other. All possible related variables are included while all irrelevant predictive variables are excluded. There is no measurement error. Lastly, there should not be any correlation between the independent variables. These assumptions must be verified before proceeding to the regression.

To test the assumption of linearity, a scatter plot is created comparing the linear fit line with a mean of 99 percent confidence interval compared with the loess fit line. The data in this study met the assumption of linearity, the loess fit line (in green) and the linear fit line (in red) are indistinguishable meaning they are practically superimposed as shown in Figure 5.1.

To test for equal variances (homogeneity) scatter plots in Figure 5.1 are again considered. In this case, the scatter plot shows that the variances are relatively uniform. but there is a concern with the variable for gamers that engage in a raid for eight hours or more during the week. The relationship with the dependent variable is very close to horizontal and could pose a problem in regression analysis.

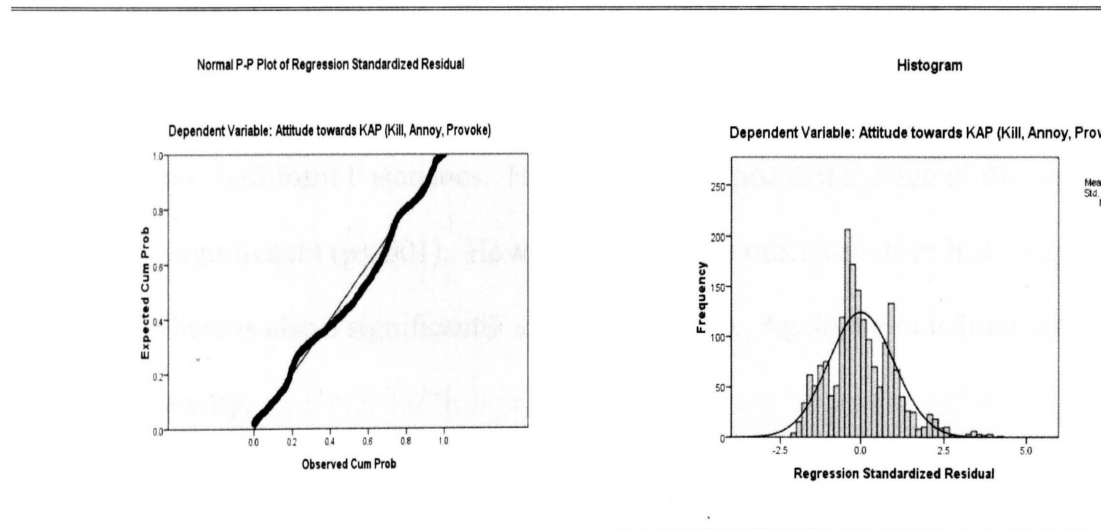
Figure 5.1 Test of Homogeneity of Variance



The assumption of normality can be satisfied by investigating the histogram of standardized residuals. The histogram produced using the necessary statistics in our data set, shows that there is a relatively normal distribution. We can accept that this assumption has been met (see Fig. 5.2).

The normality of error terms or residuals can be tested with the P-P Plot of standardized residuals. The residuals follow the 45-degree line therefore it may be assumed that the error terms are relatively normally distributed (see Figure 5.2).

Figure 5.2 Test of Normality of Responses



In order to verify if there are any influential cases, the Cook's distance statistic is considered. If the maximum of the Cook's distance statistic is less than 1, then the assumption that there are no influential cases has been satisfied (Foster, Barkus and Yavorsky 2006). In the linear regression with the variables under consideration for this study, it is found that maximum Cook's distance is .011. This is less than 1 and it may be assumed there are no influential cases and it is unnecessary to log transform any variables.

Another assumption is that no multicollinearity is present. This assumption is tested by the variance inflation factor (VIF) and tolerance statistics. There are conflicting opinions about the levels of the VIF. According to Foster et.al. the VIF and tolerance should be around 1 (Foster, Barkus and Yavorsky 2006). However, Chatterjee and Price state that a VIF greater than 10 is an indication of a problem.

When the VIF and tolerance statistics, eigenvalues and condition indices are around 1, it may be assumed that multicollinearity is not present. For this study, all of these values were around 1. Another test of multicollinearity is to check for insignificant t statistics and significant F statistics. Here it is determined that the age of the respondent did have a significant t ($p < .001$). However none of the other variables had a significant t statistic. There is also a significant F statistic ($p < .001$). Again, there is little concern for multicollinearity.

To ensure there is no multicollinearity is present a correlation matrix is also considered. Table 5.3 shows the results of the correlation matrix. This is a simple Pearson correlation between every pair of variables. If $R=1$ the pair of variables are perfectly correlated, as shown in the table when comparing the variable with itself. Foster et.al. set a standard for a high correlation at .55 to .64. None of the variables have an r within that range. Therefore we can assume that multicollinearity is not a problem of concern.

Table: 5.3 Correlation Matrix

	KAP	Raid8	Hrs10	Age	Gender	#Hrs Per wk
KAP	1.000					
Raid8	-.060	1.000				
Hrs10	-.008	.327	1.000			
Age of Player	-.385	-.080	.005	1.000		
Gender	.218	.070	.007	-.202	1.000	
# hours played in a week	.094	-.124	-.268	-.082	-.022	1.000

The difference between the mean of the population and the mean of the sample independent variables cannot be tested statistically. The population error term, which is the difference between the actual values of the dependent and those estimated by the population regression equation, should be uncorrelated with each of the independent variables. Since the population regression line is not known for sample data, the assumption must be assessed by theory. The strong law of large numbers states that the larger the sample size the closer it is to the population mean. The sample size of this study is large enough to make this assumption.

The assumption that this is the most parsimonious model relies partly upon the judgment of the researcher. There were four possible independent variables, raid4, raid8, hours6 and hours10. It is determined that gamers who answered yes to the higher number would also respond yes to the lower number, creating an overlap. For this reason the variable that represents if a player engaged in a raid for four hours or more in a week (raid4) and if the player engaged in a raid for six hours or more in a week (raid6), were not considered for this study, in order to avoid the overlap. This is also done to meet the assumption that no over-fitting exists in the model.

MANN-WHITNEYU-TEST

The Mann-Whitney U-test is useful for exploring if the mean of two groups are different. The first condition for this test is the lowest level of measure for the dependent variable is ordinal. The dependent variable in this investigation is scaled 1 to 5, with responses that can be ranked, so the data in this sample meet that requirement.

The other condition is the independent variables have two categories. This is also true of the variable for those who engage in a raid for eight hours or more in a week, with a response of yes or no. Additionally, the variable for playing the MMORPG for 10 hours continuously in a week is also dichotomous.

The results of the Mann-Whitney U-test are shown in Table 5.4. Since the hypothesis for this study is one way, the two-tailed probability is divided in half. The independent variable for playing the MMORPG in an aggressive intensive raid is not statistically significant at a level of .355. Playing the MMORPG continuously for 10 hours or more in a week was found to be significant at level .009. The mean rank for yes is considerably higher than the mean rank for no. This indicates that there is a significant relationship between killing, annoying and provoking other players and playing the MMORPG for 10 hours or more continuously in a week. Further test are required to determine the nature of this relationship.

Table 5.4 T-Test KAP by Raid8 and KAP by Hours 10

	T-Statistic		Mean Rank	
	2-Tailed	1-Tailed	Yes	No
KAP with 5 Categories Raid8	.710	.355	927.24	937.03
KAP with 5 Categories Hours10	.019*	.009**	955.25	897.52
*p<.05 **p<.01				

REGRESSION ANALYSIS

These are the hypotheses considered:

1. Engaging in MMORPG goal-oriented aggressive activity, continuously for eight hours in a raid will increase the frequency of non-goal-oriented aggressive activities of a gamer, such as KAP.
2. Engaging in MMORPG a goal-oriented aggressive activity, continuously for 10 hours will increase the frequency of non-goal-oriented aggressive activities such as KAP.

To test these hypotheses a series of simple linear regressions were run to see if there is a significant relationship between the dependent and independent variables (see Table 5.2). Model 1 in Table 5.5 includes only of the two independent variables (see Table 5.5).

In Model 1 of Table 5.5, we find that playing the MMORPG in a raid for eight hours or more in a week is *not* found to be a significant indicator of whether a gamer will engage in non-goal-oriented activity at level .631 ($p < .05$). This supports the theory proposed in this study stating that engaging in aggressive-intensive behavior in a video game will not increase the gamer's non-goal-oriented aggressive activity. This finding does not support the research hypothesis that playing the MMORPG in a goal-oriented aggressively intensive will increase the gamer's non-goal-oriented aggressive activity of killing, annoying or provoking other players within the MMORPG.

Playing a MMORPG for 10 hours or more continuously within a week is statistically significant at the .01 level. On average, of individuals in the sample, an individual who plays the MMORPG for 10 hours or more continuously in a week tends to be .114 points less likely to engage in killing, annoying or provoking other players than does an individual who does not play the MMORPG for 10 hours or more in a week. This supports rejecting the hypotheses in favor of the alternative hypothesis of playing the MMORPG for 10 hours or more in a week will not increase the gamer's non-goal-oriented activity of killing, annoying or provoking other players. An R^2 of .004 indicates that .4 percent of the variation in the reported occurrences of killing, annoying and provoking other players is explained by its linear relationship with playing the MMORPG for 10 hours or more continuously within a week.

Table 5.5: Unstandardized Regression Coefficients (Standard Error in Parenthesis)
Predicting the MMORPG Player's Attitude Towards Non-Goal Oriented Aggressive Activity

Predictor	Model 1	Model 2	Model 3	Model 4
Constant	2.063*** (.038)	3.196*** (.072)	3.099*** (.083)	2.672*** (.102)
Engaged in 8 hour raid	.022 (.046)	-.044 (.043)	-.039 (.043)	-.054 (.043)
Played VG continuously for 10 hours or more	-.114** (.043)	-.091* (.040)	-.067 (.041)	-.063 (.002)
Age		-.039*** (.002)	-.039*** (.002)	-.036*** (.002)
Hours playing VG in a week			.003* (.001)	.003* (.001)
Gender (Dummy) Male				.391*** (.056)
R ²	.004			
Adj. R ²		.151	.153	.174
F	3.539*	111.556***	85.266***	79.48***
N	1,865	1865	1865	1864

*p<.05 **p<.01 ***p<.001

Model 2 in Table 5.5 adds the control variable age to Model 1. Playing a MMORPG for 10 hours or more in a week has a statistically significant negative effect on KAP(p<.05). On average, of the participants in the sample, an individual who has plays the MMORPG for 10 hours or more continuously in a week tends to be .091 points less likely to engage in killing, annoying or provoking other players in the MMORPG than does an individual who does not play the MMORPG for 10 hours or more in a week.

Playing the MMORPG in a goal-oriented aggressive intensive raid for eight hours or more is once again not found to be statistically significant at level -.044. Also, age is statistically significant ($p < .001$). On average, of the respondents in the sample, with every year increase in the respondent's age the occurrences of killing, annoying and provoking other player's decreases by .039 points. An R^2 of .151 indicates that 15.1 percent of the variation in the reported occurrences of killing, annoying and provoking other players is explained by its linear relationship with playing the MMORPG for 10 hours or more continuously within a week and the age of the respondent.

Model 3 in Table 5.5 adds the control variables age and the number of overall hours spent playing the MMORPG in a week. Model 3 shows that the independent variables are not statistically significant. Playing a raid for eight hours or more in a week was not statistically significant at level -.039 ($p < .05$). Playing the MMORPG for 10 hours or more continuously in a week was not statistically significant at level -.067 ($p < .05$). Model 3 Table 5.5 shows that age is statistically significant ($p < .001$). On average, of individuals in the sample, with every year increase in the participant's age, the occurrences of killing, annoying and provoking other player's decreases by .039 points. The number of hours spent playing the MMORPG in a week is also statistically significant ($p < .05$). Table 5.5 also shows that on average, of individuals in the sample, with every one unit increase in the number of hours spent playing the MMORPG in a week, the occurrences of killing, annoying and provoking other player's increases by .003 points. An R^2 of .153 indicates that 15.3 percent of the variation in the reported

occurrences of killing, annoying and provoking other players is explained by its linear relationship with the age of the respondent and the number of hours spent playing the MMORPG within a week.

Model 4 includes all control variables. This model explains more of the variance in the reported occurrences in killing, annoying and provoking other players than does Models 1 thru 3. The independent variables are found not to be statistically significant. Of those that play the MMORPG in a goal-oriented aggressive intensive raid for eight hours or more in a week, was found statistically insignificant at level -.054 ($0p < .05$). Playing the MMORPG for 10 hours or more continuously is also statistically insignificant at level -.063 ($p < .05$).

However, Model 4 shows that age is statistically significant ($p < .001$). On average, of individuals in the sample, with every year increase in the participant's age, the occurrences of killing, annoying and provoking other player's decreases by .036 points. The number of hours spent playing the MMORPG is statistically significant ($p < .05$). Table 5.5 also shows that on average, of individuals in the sample, with every one unit increase in the number of hours spent playing the MMORPG in a week, the occurrences of killing, annoying and provoking other player's increases by .003 points. Lastly, the gender of the respondent is statistically significant ($p < .001$). Of the respondents in this sample, on average male respondents tend to be .391 points more likely to report engaging in killing, annoying or provoking other players than the female participants in this sample. An R^2 of .174 indicates that 17.4 percent of the variation in

the reported occurrences of killing, annoying and provoking other players is explained by its linear relationship with the age of the respondent, the number of hours the respondent spends playing the MMORPG in a week and the gender of the respondent.

This is part of the regression analysis, in order to test if the effects of an IV vary across gender and age, I tested several regression models with interaction terms. The only IV that was significant in any of the previous models was playing the MMORPG for 10 hours or more continuously in a week. This variable and the control variables age and gender were used to create the interaction terms. Table 5.6 shows the independent variable of playing the MMORPG for 8 hours or more in a raid and playing the MMORPG for 10 hours continuously remains statistically insignificant. The interaction effect on the independent variables on the dependent variable (KAP) does not vary across the categories of age or gender.

Table 5.6: Unstandardized Regression Coefficients (Standard Error in Parenthesis)
Predicting the MMORPG Player's Attitude Towards Non-Goal Oriented Aggressive
Activity with Interaction terms.

Predictor	Model 5	Model 6	Model 7
Constant	24.787*** (.043)	2.733*** (.133)	2.734*** (.121)
Engaged in 8 hour raid	-.054 (.043)	-.056 (.043)	-.056 (.043)
Playing VG continuously 10 hours or more	-.037 (.113)	-.219 (.129)	.221 (.186)
Age	-.036*** (.002)	-.043*** (.006)	-.043*** (.007)
Hours playing VG in a week	.003* (.001)	.003* (.001)	.003* (.001)
Gender (Dummy) Male	.429** (.165)	.039*** (.056)	.388*** (.168)
Interaction Terms			
Playing VG continuously 10 hours or more X Gender (Dummy) Male	-.029 (.118)		.002 (.120)
Playing VG continuously 10 hours or more X Age		.006 (.004)	.006 (.005)
Adj. R ²	.174	.174	.174
F	66.210***	66.525***	56.990***
N	1864	1864	1864

*p<.05 **p<.01 ***p<.001

CONCLUSION

In this chapter the dependent variable of reported occurrences of killing, annoying or provoking other players are tested against the independent variable of engaging in a raid for eight hours or more in a week and playing the MMORPG continuously for 10 hours or more during a week. In addition, the control variables of the respondent's age, gender and the number of hours spent playing the MMORPG is included in the testing. This rendered four models, one baseline model with the dependent variable and the independent variables (see Table 5.2). In addition there were three more models with the control variables added. Overall, the tests found that the best model to predict the occurrence of killing, annoying and provoking other players includes the respondent's age, the number of hours spent playing the MMORPG in a week and the respondent's gender.

If a player engages in aggressive intensive non-goal-oriented activity such as participating in a raid for eight hours or more, the test show that this is not statistically significant in determining if the gamer will engage in killing, annoying or provoking other players. In addition, play the MMORPG for 10 hours or more continuously within a week is not statistically significant in determining if the player will engage in killing, annoying or provoking other players. Model 4 also gives statistical substantiation for rejecting both hypotheses.

The additional investigation with interaction terms did not increase the variance in the respondent's self-reported non-goal-oriented activity and engaging in a raid for 8

hours or more in a week and playing the MMORPG for 10 hours or more in a week. The best model with interaction terms, Model 3 (see Table 5.6) and Model 4 without interaction terms (see Table 5.5) explain the same amount of variance in the self reported non-goal oriented aggressive activity and playing in a raid for eight hours or more in a week and engaging in MMORPG play for 10 hours or more continuously in a week.

CHAPTER VI

DISCUSSION AND CONCLUSION

An “*ad populum*” argument translates roughly as “to the people”. It is a logical fallacy that refers to knowledge that is accepted because it is popular. In society, there are many ideas that are accepted simply because of popular opinion (Thiroux and Krasemann 2009). But simply because many people believe something does not make it true, such as the concept of Santa Claus. The findings of this study support the theory proposed in this study, which is contrary to popular belief. The goal-oriented aggressive activity needed to be successful within the video game does not teach non-goal oriented aggressive behavior, within the video game.

This study focused on the gamer’s propensity towards non-goal oriented aggression *within* the video game and does not extrapolate to behavior in the ‘real’ world. This final chapter discusses the findings of the study. It also challenges popular concepts regarding MMORPGs. That is followed by a discussion of the limitations of this study. Finally, suggestions for future studies are addressed.

DISCUSSION

This study was designed as a deductive study based on secondary data. Specific information from secondary data was used to test the hypothesis that goal-oriented aggressive activity does not teach non-goal oriented aggressive behavior to gamers,

within the video game. If goal-oriented aggressive activity within the video game has the influence to teach non-goal oriented aggressive activity, it is reasonable to assume that this behavior would be exhibited first, within the video game. Therefore the focus of the study was the amount of time engaged in goal-oriented aggressive activity to determine if there was a corresponding increase in non-goal oriented activity, within the video game. This study is one of the few studies focusing on the importance of the purpose of aggressive activity within the MMORPG.

Overall, there are more male (88.5 percent) players than female (11.25 percent) in this sample (see Table 5.1a). The more popular game preference of males and females is WoW (see Table 5.1). The greater percentage of respondents (67.5 percent) reported playing the MMORPG for 10 hours or more in a week (see Table 5.3). Despite this lengthy playtime, the greater percentage of respondents (74.2 percent) did not engage in the most aggressive activity within a MMORPG, a raid for eight hours or more within a week (see Table 5.3).

The results of this study also challenge another popular belief that children are typical video game players. The average player in this study was about 28 years old. There was also one respondent that was 81, in addition to 152 (8.2 percent) respondents that were 40 years of age and older. In fact, in the original data set of 3247, only 6 (about 2 percent) respondents were under the age of 18 (see Table 5.1). Three of these respondents were 17 years old, in addition to one 14-, one 15- and one 16-year old respondent.

The self reported activity of killing, annoying or provoking other players was outlined in Table 5.4. This table shows that about 26 percent of the players (484) *never* engage in the non-goal oriented aggressive activity as compared to the 1 percent (19) players that said they *always* engage in killing, annoying or provoking other players. There were no females that self-reported engaging in this conduct. These numbers indicate that the purpose of the playing the MMORPG is not to kill, annoy or provoke other players, but to be successful within the game.

The guiding force for this study was the theory proposed in Chapter 3. The first two tenants of this theory stated that the video game does not have the influence needed to teach aggressive behavior, the players simply have an arena to express their natural propensities. This tenant is supported by the findings of this study. There are respondents that play the MMORPG for up to 110 hours, longer than a normal work week and far longer than the average school week. From personal experience, it is safe to assume that most of that time is engaged in leveling up, which requires positive goal-oriented aggressive activity.

The most telling statistics of this entire study are not the variables that were found statistically significant in their influence on a gamer's attitude towards engaging in non-goal-oriented aggressive behavior, but the data that was *not statistically significant*. The most aggressively intensive activity within a video game is a raid. A raid involves hours of nothing more than killing as many NPC as possible in goal-oriented aggressive activity. The goal of the raid is to kill the game boss who is the primary target of the raid.

Often, it will require the assistance of a group of gamers in order to be successful. Gamers kill and die continuously throughout the raid. If video games teach gamers aggressive behavior, a raid is the most opportunity-rich environment in which to learn it.

However, engaging in a raid for eight hours or more in a week was the only independent variable which was statistically *insignificant* in every regression model. Engaging in a raid was never a determining factor or influence on whether a player will engage in non-goal oriented activity within a video game. Additionally, playing the video game for 10 hours or more within a week was *insignificant* in the best fitting model determining what characteristics can predict whether a gamer will kill, annoy or provoke other players (see Table 5.7).

There are respondents who reported playing the MMORPG for as many as 110 hours , while others reported as little as 30 minutes per week, with an average of about 25 hours in a week (see Table 5.1). Sutherland and Cressey noted that if a behavior teaches aggression, it will teach aggression consistently to everyone that engages in the behavior (Sutherland and Cressey 1974). If gamers do learn non-goal oriented activity though the amount of time they spend playing the MMORPG, respondents that spend the most time playing should also be the most inclined to kill, annoy and provoke other players.

However, this was not the case. The vast majority of gamers do not engage in negative non-goal oriented aggressive activity within the MMORPG. Of the entire data set of 1,867 there were 17 (.9 percent) who played the MMORPG for 80 hours or more in a week. Yet, when the linear regression determined the variables that have the greatest

influence on whether a gamer will kill, annoy or provoke other players, the most goal-oriented aggressive activities were insignificant. It was the characteristics of the respondent that emerges as the best indicators; age ($p < .001$) in all three models and gender ($p < .001$) (see Table 5.7).

This study also finds that there is a negative relationship between the respondents' age and engaging in non-goal oriented aggressive activity. In each model with control variables, as the respondent's age increases the propensity to engage in killing, annoying or provoking other players decreases (see Table 5.7). This statistic indicates that the characteristic of the respondent, their maturity level, is a better predictor on whether the gamer will engage in non-goal oriented aggressive activity than the aggressive activity engaged in within the game.

It is also interesting that of the 1,879 cases in this study; only about 8 percent (14) of the males play the MMORPGs for 10 hours or more continuously during the week. Also, only about 7 percent (11) of those that engage in a raid for eight hours or more during the week, self-reported *always* engaging in non-goal oriented aggressive activity within the video game. It is also notable that none of the 216 females who play the MMORPG for 10 hours or more during the week or engage in a raid for eight hours or more during the week self-reported *always* engaging in non-goal oriented activity within the game.

This study finds that the strongest set of predictor variables as noted in Model 4 of this study, still only explains 17.4 percent of the variance of a linear regression. This

entire set of variables that included gender, age, how long the gamer plays the video game and playing the MMORPG continuously for 10 hours or more, are not strong predictors of whether a gamer will engage in non-goal oriented activity within the MMORPG. The only significant variables are age ($p < .001$), the number of hours playing the MMORPG in a week ($p < .05$) and the gender of the respondent ($p < .001$) (see Table 5.7).

Another finding is that gender is a strong indicator for non-goal oriented aggressive activity. The results of regression performed in this study show that after age, gender is the next strongest characteristic of the gamer to predict whether the gamer will engage in non-goal oriented activity (see Table 5.7).

IMPLICATIONS

Past studies that contend that video games teach aggression are generally methodologically flawed. They all make the leap from the virtual world to the real world without consideration that the connection they are making could be spurious. The emphasis in the past has been that the video game teaches aggression. Not until recently has it been considered that the gamer brings their aggressive propensities into the game as a character trait of the gamer (Markey and Markey 2010).

In fact, according to theorists Sutherland and Cressey in their differential association theory, one learns socially deviant or criminal behavior from intimate relationships (Sutherland and Cressey 1974). Past studies that take young children and allow them play video games that hit and then notice that the child carries this behavior

into the real world. It is then assumed that the game has the ability to teach an older person aggressive behavior. The flaw is in the design of these types of studies.

Aggressive video games are not age-appropriate games for young children (ESRB 2010). The gaming industry has voluntarily rated each game according to age appropriateness. Video games are clearly marked according to their age appropriateness. A responsible parent would not give a young child inappropriate entertainment material. Studies that use small children to explain the behavior of adults are methodologically flawed. These studies need to be conducted with a sample group representative of gamers whose average age is around 28 years.

Additionally, the unit of analysis must be considered. There are many meta-analysis studies that supposedly address aggression and video games. Meta-analysis is a statistical technique for amalgamating, summarizing and reviewing previous quantitative research. Meta-analytical studies collect articles already written, counting their findings in order to draw conclusions. However, the sample in this situation is not the video game player nor the attitude towards aggressive behavior, but the *article*. “Unit of analysis: the what or whom being studied” (Babbie 2007). The meta-analytical studies conducted by Anderson and his co-authors did not interview gamers, conduct a survey of a gamer’s attitudes nor have direct contact (even through secondary data) with people who play video games. This group gathers articles written and compares the conclusions. They come to the conclusion that video games teach aggressive behavior because of the number of articles making that assertion. The unit of analysis for these studies is not the

gamer or the gamer's behavior, but the conclusions of these articles. At best, these meta-analytical studies can only address how many articles support one point of the view or the other. It could also give a ratio of these articles. However, meta-analytical studies cannot collect sample data on the conclusions of articles (as a unit of analysis) then extrapolate to the population of video gamers (a different unit of analysis).

Public policy stems from the process of perceived public issues that stimulate a response from the public, law makers and grants available for research.

Once a problem gains lawmakers' full attention, it tends to generate study groups, congressional hearings, and new legislation for regulation or research funding. All these steps involve a community of key stakeholders - academic researchers, child advocates, and industry lobbyists, among others - who work with or against policymakers as they hammer out the fine points of the legislative agenda (Jordan 2008).

With methodologically flawed research, policy makers may find themselves chasing red herrings rather than producing viable social policy.

LIMITATIONS

Survey is a substantiated method used in collecting data. However, collecting data over the Internet is relatively new. Although Internet research does not face some of the traditional weaknesses of survey research, such as mail distribution and response or monitoring returns, there are naturally some concerns that must be addressed. These include the concerns of whether the respondents are representative of the population they will represent or duplicate responses (Babbie 2007).

For this study, as the population is that of avid and frequent Internet users, an Internet survey would be the best method for collecting the data. As noted by the University of Texas at Austin's Web site on the disadvantages of Internet surveys, the demographics of Internet users is rapidly changing. Gathering information from this population is most advantageously done via the Internet. As of January 2, 2008 Blizzard, the home company of World of Warcraft, announced over 10 million subscriptions to the game worldwide. Thus, gathering information in the media accessible to the population is warranted.

There is also the concern of one respondent with multiple case responses, more precisely, duplicate entries. Dr. Yee addressed this issue by assigning each respondent a unique ID. However, the unique ID was the user's email address and it is acknowledged that duplicate cases are still possible, as many people have more than one email address. Therefore, to further eliminate the possibility of duplicate cases, the data was systematically sorted and searched. Exact duplicates were matched and only one of the cases was selected for the study.

This study focused on the behaviors within the MMORPG. It is limited by the inability to identify the propensities innate within the gamer. There is also no way to draw a connection between in-game behavior and real world behavior.

This study would benefit from a survey that is designed to focus on the respondent's attitude toward aggressive behavior. The survey should investigate if the

gamer has a preconceived notion of goal-oriented aggressive activity as compared to non-goal oriented aggressive activity.

Lastly, this investigation is limited to the existing responses to a survey designed with a focus other than the aggressive activity within MMORPGs. I am very grateful, however, to Dr. Yee for making this data available. This weakness should be addressed in future studies by gathering additional information to add to the existing pool of studies and the debate on whether video games teach aggressive behavior.

FUTURE RESEARCH

Of course the findings of one study do not support a theory. There is great need for more studies that address aggressive behavior and video games, but these need to be studies based in scientific fact coupled with knowledge of the subject. This study has its limitations. The data is secondary data collected with a different goal in mind when the survey was in the design stage. As technology and the virtual world become a more intricate part of our everyday world, there is a great need to understand the impact it will have on society.

Future studies can better reflect the impact of goal-oriented aggressive video games if the research tool found a way to compare virtual world aggression with real world aggression of the video gamer. Future studies have to have internal validity before “jumping on the bandwagon.” Studies have to accurately reflect what actually went on within the study. If the unit of analysis within a study is a group of 5 year old children, then it also must identify the video game the children played and if the game was age

appropriate. In addition, these studies produce data that applies to 5 year olds. Likewise, if the study counts the results of previous written articles, it cannot draw or extrapolate conclusions that relate to individuals or groups. It can only draw and extrapolate conclusions as they relate to published or unpublished articles.

In addition, future studies also need to address the concept that there is positive and negative aggressive behavior, not arbitrarily dumping all behavior into the negative category. This concept is well established within the field of psychology. It has also been established with the field of sociology, however many researchers tend to dismiss this concept.

Furthermore, this study in no way claims to be the definitive answer to the highly debated concept of whether video games teach aggressive behavior. It does offer a new perspective on how to study the attitudes of those that play video games and how they view aggressive behavior. That is, testing to see if the gamer is inclined to engage in non-goal oriented aggressive behavior *within* the video game. Any other weaknesses identified within this study that may have been overlooked would also be grounds for a future investigation.

CONCLUSION

The debate on whether MMORPGs can teach aggressive activity will rage on. There probably will be no single definitive study, but the findings in this small study suggest that there is still room for more quantitative studies. Understanding aggressive activity and the conditions that may encourage aggressive activity would be a very useful

societal tool. Programs designed to help children with aggression issues need this information in order to be effective. Video games have great potential as a learning tool. Many schools have found that addressing all learning styles, including visual and tactile learners, has had great success. Video games should be assessed on their potential, instead of focused on as a societal detriment. This study joins the body of literature that statistically supports the finding that video games do not teach aggressive activity. This study determined that within a video game, the most intensive gamers were not more inclined to engage in the ample opportunities to engage in non-goal oriented activity.

EPILOGUE

My research began in 1995 with an experience not unfamiliar to most parents: my second son asked me to buy him a computer game. Computer games were not unfamiliar to my household, since the release of the Atari play system my first son and I spent hours playing games such as “pong” and “Pitfall Harry” on our family’s television. The media had simply changed from our television to our first brand new computer purchased for the purpose of pursuing my Master’s degree.

What made this purchase unique was its eventual purpose in my son’s life. This son was diagnosed with ADHD at a very young age. He often became frustrated to the point of explosion. These explosions ranged from temper tantrums to fights on the school yard or with his brother. Little did I realize at the time of that purchase how World of Warcraft would help me recognize the real world benefits of engaging in virtual world activity. Prior to that purchase, I accepted the urban legend that violent behavior within video games taught real world aggressive behavior, but I had my doubts.

With our Nintendo Play System, I had noticed that my son’s desire to play the games was a useful training tool. Good grades were rewarded with new games. Playing time was the reward for completing household tasks, such as a clean bedroom. Yet it wasn’t until World of Warcraft that I realized there was another benefit. The anger and frustration my son often experienced could be alleviated by allowing him to kill monsters. I noticed that while playing the game he became engrossed in developing a

strategy to defeat the game level Boss. Within the virtual world, he wasn't the child teachers singled out and labeled "the trouble maker". Within this world he not only could find success, but a place where he was not the villain. In the virtual setting, he could be that person he was inside, curious, adventuresome, fearless – a hero!

I soon used this game as a place where my son could express his aggression in a socially acceptable setting. Within the game he could release all that energy that hindered his success in school and on the playground. Eventually, I realized that the video game did not teach him aggressive activity. The aggression generated somewhere within my son, either as a result of the ADHD or as a part of his personality. The virtual world became the first place he did not have to bottle this aggression and suffer with the frustration that churned within him and often caused severe consternation in his life.

All too often we have allowed popular opinion, fear and stereotypes to vilify entertainment without evidence. We have accepted as common knowledge without question, the idea that the virtual world can successfully do what total institutions often cannot – resocialize the individual.

This study is the first spark of my flaming desire to show the benefits that can be realized within the virtual world. My data does not support that negative aggressive behavior is brought to the game by the player. But the fact that the longer a person plays, the less likely they are to engage in negative aggressive behavior certainly ignites the question, can virtual worlds be used as a socially acceptable tool for aggression. I am glad that my research confirms the haunch of the "Differential Association" theorists in

the middle of the 20th century who had to battle the phobia of their own time: the supposed menace of the new communication tools: telephone, television, and film. They concluded then, as I do now, that it is not the tools that changes behavior, it is interaction with live human beings: parents, teachers, peer groups, and friends.

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APPENDIX A:
VIDEO GAME RATING SHEET

Video Game Rating Sheet

1. How difficult was Myst?

1	2	3	4	5	6	7
Easy						Difficult

2. How enjoyable was Myst?

1	2	3	4	5	6	7
Not Enjoyable						Enjoyable

3. How frustrating was Myst?

1	2	3	4	5	6	7
Not Frustrating						Frustrating

4. How exciting was Myst?

1	2	3	4	5	6	7
Not Exciting						Exciting

5. How fast was the action of Myst?

1	2	3	4	5	6	7
Slow Action						Hectic Action

6) How violent was the content of Myst?

1	2	3	4	5	6	7
No violent Content						Very Violent Content

7. How violent were the graphics of Myst?

1	2	3	4	5	6	7
No violent Graphics						Very Violent Graphics

APPENDIX B:
VIDEO GAME QUESTIONNAIRE

Video Game Questionnaire

Instructions: Please think of the five video games that you have played for the greatest amount of time from when you were in 7th grade until the present. Include computer, console/TV, and arcade games. Please write down the titles of these games on the blank lines below. If you have never played a video game in your life, please check here and go onto the next questionnaire ____.

- 1) Title of your "most played" game: _____
PLEASE PRINT CLEARLY
- 2) Title of your "2nd most played" game: _____
PLEASE PRINT CLEARLY
- 3) Title of your "3rd most played" game: _____
PLEASE PRINT CLEARLY
- 4) Title of your "4th most played" game: _____
PLEASE PRINT CLEARLY
- 5) Title of your "5th most played" game: _____
PLEASE PRINT CLEARLY

Now, please rate each game by answering the questions that follow.

1) For the following items, rate the game you listed as your "most played" game:

- a) In the last month, how often have you played this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often
- b) During 11th & 12th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often
- c) During 9th & 10th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often
- d) During 7th & 8th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often
- e) How violent is the content of this game?

1	2	3	4	5	6	7
Little or No						Extremely
Violent Content						Violent Content
- f) How bloody/gory are the graphics of this game?

1	2	3	4	5	6	7
Little or No						Extremely
Blood & Gore						Bloody & Gory

d) Which of the following categories best describes this game? Check all that apply.

___ Education ___ Sports ___ Fantasy ___ Fighting with hands/feet ___ Fighting with Weapons ___ Skill

2). For the following items, rate the game you listed as your "2nd most played" game:

- a) In recent months, how often have you played this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- b) During 11th & 12th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- c) During 9th & 10th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- d) During 7th & 8th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- e) How violent is the content of this game?

1 2 3 4 5 6 7
Little or No Extremely
Violent Content Violent Content

- f) How bloody/gory are the graphics of this game?

1 2 3 4 5 6 7
Little or No Extremely
Blood & Gore Bloody & Gory

- d) Which of the following categories best describes this game? Check all that apply.

☐ Education ☐ Sports ☐ Fantasy ☐ Fighting with hands/feet ☐ Fighting with Weapons ☐ Skill

3). For the following items, rate the game you listed as your "3rd most played" game:

a) In recent months, how often have you played this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

b) During 11th & 12th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

c) During 9th & 10th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

d) During 7th & 8th grades, how often did you play this game?

1	2	3	4	5	6	7
Rarely			Occasionally			Often

e) How violent is the content of this game?

1	2	3	4	5	6	7
Little or No Violent Content						Extremely Violent Content

f) How bloody/gory are the graphics of this game?

1	2	3	4	5	6	7
Little or No Blood & Gore						Extremely Bloody & Gory

d) Which of the following categories best describes this game? Check all that apply.

☐ Education ☐ Sports ☐ Fantasy ☐ Fighting with hands/feet ☐ Fighting with Weapons ☐ Skill

4). For the following items, rate the game you listed as your "4th most played" game:

a) In recent months, how often have you played this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

b) During 11th & 12th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

c) During 9th & 10th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

d) During 7th & 8th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

e) How violent is the content of this game?

1 2 3 4 5 6 7
Little or No Extremely
Violent Content Violent Content

f) How bloody/gory are the graphics of this game?

1 2 3 4 5 6 7
Little or No Extremely
Blood & Gore Bloody & Gory

d) Which of the following categories best describes this game? Check all that apply.

☐ Education ☐ Sports ☐ Fantasy ☐ Fighting with hands/feet ☐ Fighting with Weapons ☐ Skill

5). For the following items, rate the game you listed as your "5th most played" game:

- a) In recent months, how often have you played this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- b) During 11th & 12th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- c) During 9th & 10th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- d) During 7th & 8th grades, how often did you play this game?

1 2 3 4 5 6 7
Rarely Occasionally Often

- e) How violent is the content of this game?

1 2 3 4 5 6 7
Little or No Extremely
Violent Content Violent Content

- f) How bloody/gory are the graphics of this game?

1 2 3 4 5 6 7
Little or No Extremely
Blood & Gore Bloody & Gory

- d) Which of the following categories best describes this game? Check all that apply.

☐ Education ☐ Sports ☐ Fantasy ☐ Fighting with hands/feet ☐ Fighting with Weapons ☐ Skill

APPENDIX C:
SURVEY QUESTIONS

Survey Questions

This study will use nine survey responses from the original data set. The survey questions under consideration for this study are:

1. Gender (Female/Male)
2. Age (in years)
3. The game I currently play is:
4. I spend about ____ hours each week playing the game (numeric).
5. Have you ever played continuously for 10 hours? (Yes/No)
6. Have you ever been in a raid / dungeon group that lasted for at least 8 hours? (Yes/No).
7. Dominating/killing other players.
1:Never, 2: Seldom, 3:Sometimes, 4:Often, 5:Always
8. Doing things that annoy other players.
1:Never, 2: Seldom, 3:Sometimes, 4:Often, 5:Always
9. How often do you purposefully try to provoke or irritate other players?
1:Never, 2: Seldom, 3:Sometimes, 4:Often, 5:Always

APPENDIX D
IRB APPROVAL



Institutional Review Board

Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
email: IRB@twu.edu

December 16, 2009

Ms. Sherry Cooke Hayes
6705 CR 134
Celina, TX 75009

Dear Ms. Hayes:

Re: Does Intended Aggressive Activity Increase Unintended Aggressive Activity Within Video Games?

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. Rhonda Buckley, Co-Chair
Institutional Review Board - Denton

cc. Dr. James Williams, Department of Sociology & Social Work
Dr. Philip Yang, Department of Sociology & Social Work
Graduate School