EFFECTS OF OUTCOME OF A VIDEOGAME ON
FRUSTRATION AND AGGRESSION

CHRISTOPHER E. HAWK

Bachelor of Arts in Psychology
Washington & Jefferson College
May, 2012

Submitted in partial fulfillment of requirements for the degree
MASTER OF ARTS IN PSYCHOLOGY
At the
CLEVELAND STATE UNIVERSITY
May, 2014
We hereby approve this thesis for

Christopher E. Hawk

Candidate for the Master of Arts in Psychology degree for the

Department of Psychology

and the CLEVELAND STATE UNIVERSITY

College of Graduate Studies

Thesis Chairperson, Steve Slane

Thesis Committee Member, Michael Wisniewski

Thesis Committee Member, Cheryl Bracken

Student’s Date of Defense: April 1, 2014
EFFECTS OF OUTCOME OF A VIDEOGAME ON
FRUSTRATION AND AGGRESSION

CHRISTOPHER E. HAWK

ABSTRACT

The effect of winning or losing in a videogame on levels of aggression and frustration was examined in this experiment. A total of 109 college-aged students at Cleveland State University participated in this study. The participants were randomly assigned to either a winning group or a losing group. Participants played a videogame for 15 minutes against computer controlled bots, and then filled out questionnaires. There was a significant difference between groups for the frustration scores, \( t(107) = 2.580, p = .011 \), but there was no significant difference for aggression. In accordance with the hypothesis, there was a significant increase in frustration for the losers but not for the winners. However, there was no significant difference for aggression regardless of the group. This lack of change in aggression could be due to the amount of time the participant spent playing the videogame.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>VI</td>
</tr>
<tr>
<td>List of Figures</td>
<td>VII</td>
</tr>
<tr>
<td>I INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Aggression</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Frustration</td>
<td>4</td>
</tr>
<tr>
<td>1.3 Violent Videogames and Aggression</td>
<td>4</td>
</tr>
<tr>
<td>1.4 Competition</td>
<td>6</td>
</tr>
<tr>
<td>1.5 Hypotheses</td>
<td>8</td>
</tr>
<tr>
<td>II METHOD</td>
<td>9</td>
</tr>
<tr>
<td>2.1 Participants</td>
<td>9</td>
</tr>
<tr>
<td>2.2 Apparatus</td>
<td>9</td>
</tr>
<tr>
<td>2.3 Manipulation</td>
<td>10</td>
</tr>
<tr>
<td>2.4 Measures</td>
<td>10</td>
</tr>
<tr>
<td>2.5 Analysis</td>
<td>11</td>
</tr>
<tr>
<td>2.6 Procedure</td>
<td>11</td>
</tr>
<tr>
<td>2.6.1 Familiarization</td>
<td>11</td>
</tr>
<tr>
<td>2.6.2 Play Session</td>
<td>12</td>
</tr>
<tr>
<td>III RESULTS</td>
<td>13</td>
</tr>
<tr>
<td>IV DISCUSSION</td>
<td>19</td>
</tr>
<tr>
<td>4.1 Possible Applications</td>
<td>20</td>
</tr>
<tr>
<td>4.2 Limitations</td>
<td>21</td>
</tr>
</tbody>
</table>
4.3 Future Research.................................................................................................21

REFERENCES........................................................................................................23

APPENDICIES.........................................................................................................25
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE I</td>
<td>Means, Standard Deviations, and t Values for Subscales of Aggression</td>
<td>16</td>
</tr>
<tr>
<td>TABLE II</td>
<td>Correlations between Frustration and Subscales of Aggression</td>
<td>17</td>
</tr>
<tr>
<td>Figure</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Figure 1: Mean Frustration Scores</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

In recent years, much research has been conducted on the topic of violent video games and their relation to aggression. Both parents and policymakers have become worried about violent video games, even more so than TV and music violence (Anderson, Berkowitz, Donnerstein, Huesmann, Johnson, Linz, Malamuth, & Wartella, 2003). This is understandable as many popular video games contain violence where the player is an active participant, as opposed to a passive consumer when watching TV violence or listening to violent music (Anderson et al. 2003). However, many studies to date have left out very crucial variables: the competitive aspect of the games and the frustration inherent in the competition. Further research has not addressed whether the frustration, inherent in competitive and violent video games, influences players’ feelings of aggression.

1.1 Aggression

According to Anderson and Bushman (2001) “aggression is behavior intended to harm another individual who is motivated to avoid that harm… violence refers to extreme forms of aggression, such as physical assault and murder. All violence is aggression, but
not all aggression is violence” (p. 354). These definitions mean that while playing a
violent video game, the player is viewing, and often participating in, aggression of some
form. Also, these definitions address behaviors and not emotions, meaning that the
feeling of wanting to physically harm someone but not acting on that impulse is different
from actually physically harming someone. Finally, although violent video games are not
real, i.e. the violence is not actually aimed at a living person, the player is interacting with
the game and in that context the violence is real. It would be similar to the argument that
violence in movies is not real because no one actually gets hurt; they are all acting.
However, in the context of the medium, the violence and subsequent aggression is real.

Dollard, Doob, Miller, Mowrer and Sears (1939) more simply define aggression
as “an act whose goal-response is injury to an organism (or organism-surrogate)” (p. 11).
In other words, an action intended to harm someone or something. Dollard et al. (1939)
define frustration as “that condition which exists when a goal-response suffers
interference” (p. 11). Thus, frustration is the feeling of not getting what one wants or not
achieving an anticipated goal. The Frustration-Aggression Model (Dollard et al., 1939)
postulates that “aggression is always a consequence of frustration…” and “…the existence of
frustration always leads to some form of aggression” (p. 1). In order to understand the
postulate, one must consider the ideas of direct and indirect aggression, as well as overt
and non-overt aggression. Simply put, direct aggression is aggression directed at
whatever caused the frustration and indirect aggression is aggression directed at
something or someone else. However, overt and non-overt aggression are not discrete
cases; they should be thought of as extremes on a continuum of aggressive actions. For
example, if John’s professor, Dr. Smith, always found fault with John’s papers and John
punched Dr. Smith in the face, John would be exhibiting direct and overt aggression. However, if John were to redouble his efforts, in spite of Dr. Smith, and submit a paper that was virtually error free, John would be exhibiting indirect and non-overt aggression.

Berkowitz (1988), reformed the Frustration-Aggression Model. In this reformed model, frustration is defined as an aversive event that an ordinary person would want to avoid and aggression is brought on by frustration, i.e. when a person encounters a frustrating event, that person will react with aggression. Interestingly, Berkowitz (1988) found that “many of the studies of the effects of competitive games suggest that competition is more likely to arouse aggressive tendencies…” and “…competitive situations frequently arouse feelings of rivalry that. . . involve going out of one’s way to hurt the other person” (pp. 66-67). These findings suggest that frustration, and by extension aggression, should increase while playing a video game where there is competition.

Berkowitz and LePage (1967) examined the effect of weapons on aggression and found that weapons do prime participants to act more aggressively: the weapons effect. These findings may mean that the reason players of violent video games act violently is because they were primed to do so by the violence in the video game. The act of being aggressive in the video game primes the player to act more aggressively in real life. Thus, by combining the Frustration- Aggression Model with this finding, it could be theorized that a person who becomes frustrated while playing a violent video game could be more aggressive because the player was primed by the violence in the video game.
1.2 Frustration

Due to the fact that the term “frustration” has many different meanings in various domains of research, it is important to delineate frustration for the purposes of this study. As mentioned above, frustration is “that condition which exists when a goal-response suffers interference” (Dollard et al., 1939, p. 11). In other words, one becomes frustrated when a set plan goes awry. In the context of video games, this would mean that if a player was going to shoot an opponent, and the opponent shot the player first, the player would become frustrated. This conceptualization of frustration should not be confused with frustration surrounding the difficulty of understanding how to play the game, e.g. understanding the controls or understanding what the player is supposed to be doing.

In two studies, one by Astor, Adam, Jähnig, and Seifert (2013) and the other by Fülöp (2009), frustration and losing was examined. Frustration, as well as disappointment, is closely associated with the thought of losing, to a significant degree for Japanese, Hungarian, and Canadian people (Fülöp, 2009). Also, the outcome of online auctions influence the frustration levels of auctioneers depending on whether the auction was won or lost, with losers being more highly frustrated (Astor, Adam, Jähnig, & Seifert, 2013). Thus, there is a clearly an adverse reaction to losing, i.e. having higher levels of frustration after losing. However, there is little research on frustration as it pertains to violent video games and aggression.

1.3 Violent Videogames and Aggression

There have been many studies that attempt to show a relationship between violent video games and increased aggression. In a meta-analysis by Anderson and Bushman (2001), it was found that “exposure is positively associated with heightened levels of
aggression in young adults and children, in experimental and nonexperimental designs, and in males and females. Exposure is negatively associated with prosocial behavior” (p. 358). This may be true; however, many of the studies used in the meta-analysis did not evaluate the competitiveness of the games being used. Thus, it may be that violence is not what caused the increase in aggression, but competitiveness, inherent in most violent video games, which caused increased aggression.

Anderson and Morrow (1995) studied the effects of competition and cooperation on aggression by having participants play a violent video game, *Super Mario Bros.*, where they were given competitive or cooperative instructions. They found that participants viewed the cooperative situation differently from the competitive situation. Thus, there were lower levels of aggression for the cooperative situations. However, “violent” is a relative term, in comparison to some of the preceding studies, *Super Mario Bros.* is relatively less violent and, thus, would yield slightly less powerful results than a relatively more violent game, such as *Halo*.

In a 2010 study, Schmierbach had three groups play a popular violent video game, *Halo*, either solo, cooperatively with another participant in the same room, or competitively with another participant in a different room. He found that there were significantly lower levels of aggression for the participants who played cooperatively when compared to the solo and competitive players (Schmierbach, 2010). The results of this demonstrates that regardless of the level of violence present in the game, violence in video games still causes increased levels of aggression in participants.
1.4 Competition

Schmierbach’s study addressed a very significant issue that many other studies overlook, the fact that the large majority of violent video game play is done against opponents, usually a human opponent. While the campaign portion is what sparks the consumer’s interest in the game, it is the multiplayer portion, which now comes with most violent games, which will be played most. For example, according to Microsoft, *Call of Duty: Modern Warfare 3* grossed over 400 million dollars and had 3.3 million unique gamers log over 7 million multiplayer game hours on a single day, the day the game released. Most popular, and lucrative, violent video games come with two components: a campaign component and a multiplayer component. The campaign component, also called a “story mode”, is usually a fairly guided excursion through a story the game is telling. To someone unfamiliar with video games, it is similar to playing out a movie. The multiplayer component, on the other hand, is where the player connects to other players, through various routes, and plays short objective based games. One of the most common is called “team deathmatch” in which two teams attempt to kill members of the opposite team; however, there are other types such as capture the flag, in which each team attempts to capture the other’s flag. The largest difference between these two components is that while the campaign stays relatively the same for each play through, the multiplayer is constantly changing. Tactics that worked in one match may no longer work, or the skill level of your opponents may change making the match easier or harder. Thus, it would be more beneficial to conduct research that includes this multiplayer aspect because it makes up the majority of the violent video game play.
Ravaja (2009) examined the effect of gamers playing against opponents who were not co-located, or not in the immediate vicinity of the gamer. Although there was no effect on frustration found for whether the non-co-located player was a friend or a stranger, there was an effect as to whether the gamer was playing against a human or the computer (Ravaja, 2009). Specifically, there was greater enjoyment when playing against a human than playing against the computer; thus, furthering the idea that players would rather play online multiplayer style games and the importance of more research in that area.

In a 2011 study, Adachi and Willoughby first compared video games on four dimensions: violence, competition, difficulty, and pace of action. The participants played either a violent/competitive, a violent/noncompetitive, a nonviolent/competitive, or a nonviolent/noncompetitive video game that was equal on difficulty and pace of action (Adachi & Willoughby 2011). They found higher levels of aggression for the competitive game, regardless of whether or not it was violent. Thus, it would appear that the competition inherent in most violent video games has a more significant effect on aggression than the violence.

There is a clear lack of research on the influence of frustration. Early studies showed that the violence in a video game was connected to levels of aggression. Later studies showed that regardless of violence, competitive games were connected to levels of aggression. However, at the heart of competition is the desired outcome of winning. Thus, by losing, it could be hypothesized, the person would be more frustrated and, consequently, more aggressive. However, to date, there has been no readily available study to test this.
1.5  Hypothesis

**H1**: Levels of frustration, as measured by a Mood Adjective Check List (MACL), will be higher for participants in the losing group than that of the participants in the winning group.

**H2**: Levels of aggression, as measured by the Buss-Perry aggression questionnaire, will be higher for participants in the losing group than that of the participants in the winning group.

**H3**: Levels of aggression, as measure by the Buss-Perry aggression questionnaire, and levels of frustration, as measured by a Mood Adjective Check List (MACL), will correlate.
CHAPTER II

METHOD

2.1 Participants

A total of 109 college students participated in this study. The age of the participants ranged from 18 to 42 years of age (M = 20.52, SD = 4.29). The gender of the participants was not a concern (72% Female, 28% Male). The SONA system was used to recruit volunteer participants from introductory level psychology classes. All participants were students at Cleveland State University. Participants in this research were treated in accordance with the “Ethical Principles of Psychologists and Code of Conduct” (American Psychological Association, 2002). This study received IRB approval from Cleveland State University (see Appendix A).

2.2 Apparatus

One Nintendo 64 (N64), produced by Nintendo, was used in this study. Perfect Dark, developed by Rare, was used, and the game was played on a 32 inch LCD color television in a small ten foot by eight foot room. Perfect Dark was chosen because it has very simple controls, one thumb stick instead of two, thus, reducing the potential of frustration arising from the participants inability to control the character.
2.3 Manipulation

The participants were randomly assigned to one of two groups: a winning group and a losing group. The winning group played against bots who were relatively easy opponents. The losing group played against bots who were quite difficult opponents. The difficulty of the bots was set using bots of different levels present in the video game.

2.4 Measures

One common way of assessing aggression is the Aggression Questionnaire, which has been used in many studies and is generally accepted as a reliable and valid measure of aggression (Buss & Perry, 1992). The questionnaire is made up of 29 questions, and is broken down into sub-scales: physical aggression, verbal aggression, anger, and hostility. The questionnaire was modified for the purposes of this study. The order of the questions was changed and distractors were added (see Appendix B). Distractors were added in order to keep the participant from knowing what was being measured. Without distractors, the questions make it apparent that the experimenter is interested in aggression or anger.

A Mood Adjective Check List (MACL) was used to measure various mood states (see Appendix B). The check list included distractors, to keep the participant from knowing what was being measured, and participants used a 7 point Likert-type scale. There are no reliability or validity data on the check list to be used in this study.

Questions were included, using 7 point Likert-type scales to allow for internal manipulation checks (see Appendix B). These included questions about how pleasant the experience was, how enjoyable playing the game was, and how easy it was to control the character in the game. These questions were meant to check that the aggression the
participants report was not due to an unpleasant and difficult to understand game. Questions were also added to collect demographic data (see Appendix C).

2.5 Analysis

For both hypotheses 1 and 2, an independent t-test was run between the winning and losing group: specifically, between the sub-scale scores on the aggression questionnaire and scores from the MACL. Pearson correlations were run between the sub-scale scores on the aggression questionnaire, scores from the MACL, and scores from other questions on the questionnaires.

2.6 Procedure

2.6.1 Familiarization

Participants signed up for a time to take part in the research.

Upon arrival, participants were given a note card to write their name and email address on, so the participants could be emailed a full debriefing upon the conclusion of the data collection. The participant was then told the following: “You will be taking part in a study about video games and emotion. We are interested in the emotional outcomes of players after playing a video game. You will play a video game for 15 minutes against computer controlled bots, and then you will fill out some questionnaires. But first, you will need to sign some papers and fill out an initial questionnaire. Please read this consent form and sign it at the bottom. If you have any questions or concerns please let me know. If you wish to withdraw your participation at any time, please let me know.” The participant was then given a short questionnaire detailing his or her experience with video games (see Appendix C), and a consent form which was to be signed and dated (see Appendix D). Participants were instructed as to how to play the video game through the
use of a short tutorial video. The participant was then allowed 3 minutes to become familiar with the controls.

**2.6.2 Play session**

When the 3 minutes had expired, the participant played for 15 minutes against AI controlled bots. Each participant played a free-for-all, death-match style game mode against the bots for the full 15 minutes, with no breaks. Upon completion of the session, each participant filled out an exit questionnaire including questions about aggression, frustration, current mood state, and impressions of the video game experience (see Appendix B).

Upon completion of the questionnaires, the participant was partially debriefed and was allowed to leave. The participants were told: “Thank you for participating in this study. If you have any concerns as to how the research was conducted or if you would like to see the results when the study has concluded you may contact myself or Dr. Slane (phone numbers and email addresses are on the consent form you received at the beginning of the study).”

Once all the data was collected, the participants were emailed a full debriefing (see Appendix E).
CHAPTER III

RESULTS

A multivariate analysis of variance was performed on five dependent variables: frustration, verbal aggression, physical aggression, anger, and hostility. The independent variable was assigned group, either winning or losing. Using Pillai’s Trace, the combined dependent variables were significantly affected by the groups assignment, $F(5, 109) = 2.75, p = .02$. In order to investigate the impact of group assignment on each dependent variable, individual analyses were performed.

Levels of frustration between winning and losing groups, as measured by a Mood Adjective Check List (MACL), were examined using a two-sample $t$ test. There was a significant difference for the frustration scores between both the winning ($M = 3.76$, $SD = 2.10$) and losing ($M = 4.81$, $SD = 2.16$) groups, $t(107) = 2.58, p = .01$.

Levels of aggression, as measure by the Buss-Perry aggression questionnaire, were examined using a two-sample $t$ test. All four sub-scales yielded no significant difference regardless of group.

Originally, participants were randomly assigned to a group, meaning he or she was either playing difficult or easy bots. Due to the participant’s ability to learn and effectively utilize the controls, an adjusted group was created after all the data was
collected. First, the kill-to-death ratio (kills divided by deaths, if the deaths was equal to zero, then the kill-to-death ratio was equal to the number of kills) was calculated for each participant. A kill-to-death ratio greater than one signified that the participant was getting more kills than deaths, a kill-to-death ratio less than one signified that the participant was getting more deaths than kills. The adjusted group was made up of participants with kill-to-death ratios greater than one in one group and participants with kill-to-death ratios less than, or equal to, one in another group. All analyses were rerun with the adjusted groups.

Levels of frustration between winning and losing groups were reexamined using a two-sample \( t \) test. There was a significant difference for the frustration scores between both the adjusted winning (\( M = 3.73, \text{SD} = 2.00 \)) and losing (\( M = 4.7, \text{SD} = 2.24 \)) groups, \( t(107) = 2.23, p = .03 \). Figure 1 depicts a bar graph of the means between the original and adjusted groups for the winning and losing groups.

Levels of aggression were reexamined using a two-sample \( t \) test. Again, all four sub-scales yielded no significant difference regardless of group. Table I shows all \( t \) values, means, and standard deviations for the sub-scales of the aggression questionnaire for both the original and adjusted groups.

The Pearson correlation was also used to examine relationships between frustration and the sub-scales of aggression. As is expected, all the sub-scales of aggression had significant positive correlations. Frustration had significant positive correlations with all the sub-scales of aggression as well. Table II depicts the correlations between frustration and the subscales of the aggression questionnaire.

A hierarchical regression was run in order to determine if the effect of frustration could be better explained by something else. The composite variables of play experience,
Figure 1. Mean frustration scores of winning and losing groups for original grouping analysis and adjusted grouping analysis. There was a significant difference for the frustration scores in both the original groups, \( t(107) = 2.580, p = .011 \), and the adjusted groups, \( t(107) = 2.233, p = .028 \).
Table I

*Means, Standard Deviations, and t Values for Subscales of Aggression*

<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th></th>
<th></th>
<th>Adjusted</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Win</td>
<td>Lose</td>
<td>Win</td>
<td>Lose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$t$</td>
<td>$M (SD)^a$</td>
<td>$M (SD)^b$</td>
<td>$t$</td>
<td>$M (SD)^c$</td>
</tr>
<tr>
<td>Verbal$^e$</td>
<td>-0.31</td>
<td>18.29 (6.37)</td>
<td>17.94 (5.16)</td>
<td>-0.89$^f$</td>
<td>18.75 (6.62)</td>
</tr>
<tr>
<td>Physical$^e$</td>
<td>1.61</td>
<td>25.67 (8.91)</td>
<td>28.78 (11.13)</td>
<td>1.14</td>
<td>25.86 (9.16)</td>
</tr>
<tr>
<td>Anger</td>
<td>0.63</td>
<td>21.35 (8.11)</td>
<td>22.30 (7.70)</td>
<td>-0.45</td>
<td>22.23 (8.56)</td>
</tr>
<tr>
<td>Hostility</td>
<td>-0.54</td>
<td>25.06 (9.58)</td>
<td>24.13 (8.34)</td>
<td>-1.00</td>
<td>25.64 (9.53)</td>
</tr>
</tbody>
</table>

*Note.* Unless otherwise noted, the degrees of freedom for all $t$ values is 107.

$^aN = 55$, $^bN = 54$, $^cN = 44$, $^dN = 65$, $^e$Verbal and Physical refer to aggression. $^f$df = 76.73.
Table II

*Correlations between Frustration and Subscales of Aggression*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frustrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Verbal</td>
<td>.28*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Physical</td>
<td>.20*</td>
<td>.53**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Anger</td>
<td>.31**</td>
<td>.66**</td>
<td>.58**</td>
<td></td>
</tr>
<tr>
<td>5. Hostility</td>
<td>.29**</td>
<td>.47**</td>
<td>.36**</td>
<td>.50**</td>
</tr>
</tbody>
</table>

*Note.* **p < 0.01 (two-tailed). *p < 0.05 (two-tailed).*
general video game experience, average amount of time spent playing video games per week, and self-reported video game ability were used and none had any significant effect on frustration.

Finally, to determine if sex had an effect on frustration, two 2 x 2 analysis of variance was performed on frustration. The independent variables were original group and sex in the first analysis, and adjusted group and sex in the second analysis. There was no significant effect of sex on frustration.
CHAPTER IV
DISCUSSION

In accordance with H1, there was a significant difference in the levels of frustration between the winning and losing groups that was not explained by other measured factors. However, in reference to H2, there was no significant difference for aggression regardless of the group. This lack of change in aggression could be due to the amount of time the participant spent playing the videogame. It is possible that a change in aggression could be seen if the participants played the game for a longer period of time, thus becoming even more frustrated.

More likely, the lack of a significant difference in the levels of aggression was due to the fact that only 4.6% of the participants had ever played the game before. Through my own observation as a gamer, as well as observation of my participants when collecting data, it is apparent that there are different mindsets that one goes through. Specifically, when someone plays a game for the first time, that person is less interested in winning and more interested in learning. Thus, there is an understanding that while learning to play the game the player will do relatively poorly; however, due to individual ability and the complexity of the game, this learning mindset will transition into a more competitive mindset. One in which the player puts a greater emphasis on winning.
Therefore, because this game was new to the vast majority of the participants, virtually all went through this learning phase where winning or losing was not a major concern. It would seem that gamers who have invested a lot of time into a game would react more extremely than someone who is playing the game for the first time.

In accordance with H3, frustration and aggression, specifically each of the sub-scales, were significantly inter-correlated. It is not surprising that the sub-scales themselves were correlated because the sub-scales are all related to aggression in general. There is clearly a connection between a person’s level of frustration and his or her level of aggression. The Frustration-Aggression Model would posit that frustration builds to aggression, and this study could support that assertion; however, it could be that frustration and aggression are not mutually exclusive but so intertwined that trying to sift through them is extremely complex. Further research would need to be conducted to parse out these differences.

4.1 Possible Applications

There are a couple of possible applications for these findings. One is in cyber therapy. Due to the fact that cyber therapy already uses an electronic medium to bring about meaningful change in a person’s life, using a video game would seem like a natural extension of that. It is possible that the person receiving the therapy could play a video game, possibly designed to elicit frustration, so that the therapist could work on the client’s reactions to frustrating events.

Another possible application could be to assess how one reacts to frustrating situations. Simply have someone play a video game, meant to elicit frustration, and then use that to assess how that person handles frustration. The person might become angry or
demoralized. Or that person might do something completely different. It is feasible that this could be used when choosing people for leadership positions, where one cannot just shut down and give up when confronted with a frustrating situation.

4.2 Limitations

One of the limitations of this study is that, as stated before, the participants had little to none of their own time invested in the game. In other words, the participant really had no personal motivation to win, unless he or she specifically wanted to win. Most people would naturally want to do well and win; however, the participants neither gained nor lost anything of value based on their performance. Thus, apathy could have played a part in the less aggressive responses to losing.

Another limitation is that the participants were playing a simulated multiplayer mode, i.e. the only human player in the match was the participant. With only one or two exceptions, almost all of online multiplayer takes place between exclusively human players. It is often easy to tell whether one is playing against a computer generated bot or an actual person. Thus, the fact that the participants knew they were playing against bots and not actual people could have changed how they responded to the gaming experience.

4.3 Future Research

As stated in the introduction, future research in the field of videogames and aggression should be focused on multiplayer modes. Of the participants who played video games for more than one hour a week, only 31.3% stated that they spend most of their time playing single player modes. Of the participants who played video games for more than seven hour a week, or equivalent to one hour a day, 60.7% stated that they spend half or more of their time playing multiplayer modes. This shows that for
videogame players, multiplayer modes consume more of their videogame play time than campaign modes. Thus, future research should focus on the aspects of multiplayer modes that are not present while playing campaign modes.
REFERENCES


APPENDIX A

*Note.* No data was collected before IRB approval was received.
APPROVAL MEMO

November 2, 2013

TO: Professor

FROM: Amy L. Govoni, CSU - IRB

RE: #29967 SLA HS

Dear Investigators Prof. Steve Slane and Chris Hawk:

I am in receipt of your email (with attachments) of November 1, 2013 @ 2:50pm in response to my ACTION MEMO dated November 1, 2013 following preliminary review of your IRB Submission #29967 SLA HS. You have now complied with all requests for additional information/revisions and are hereby approved (EXPEDITED – Category 7) to commence with your study as of November 2, 2013. You will be receiving written confirmation of this approval from the CSU IRB office in the very near future. Both myself and the secondary reviewer want to take this opportunity to extend to you the very best wishes for a successful investigative endeavor. It has indeed been both a privilege and a pleasure to be of assistance to you throughout this review process.

Respectfully expressed,
Amy L. Govoni, Primary Reviewer
IRB Submission #29967 SLA HS
APPENDIX B

Notes. The statements or moods with asterisks (*) next to them are distractors. These distractors are intended to keep the participant from realizing the true intent of the statements and mood check list. The asterisks did not appear on the questionnaires that the participants received. This questionnaire was given after the participants played the video game and after the manipulated session.
Please read each item and then, using the scale below, mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way, at the present moment.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Externally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extremely</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sad*</th>
<th>Agitated</th>
<th>Insecure*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attentive*</td>
<td>Demoralized</td>
<td>Proud*</td>
</tr>
<tr>
<td></td>
<td>On edge*</td>
<td>Energetic*</td>
<td>Uncomfortable*</td>
</tr>
<tr>
<td></td>
<td>Angry</td>
<td>Nervous*</td>
<td>Surprised*</td>
</tr>
<tr>
<td></td>
<td>Confident*</td>
<td>Frustrated</td>
<td>Curious*</td>
</tr>
<tr>
<td></td>
<td>Happy*</td>
<td>Distressed</td>
<td>Intimidated*</td>
</tr>
</tbody>
</table>

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely |
|---|---|---|---|---|---|---|characteristic |
| Extremely | uncharacteristic | of me | of me |

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I often find myself disagreeing with people.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I have stood up to a bully.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I flare up quickly but get over it quickly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>My friends say that I am very active.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If I have to resort to violence to protect my rights, I will.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I often over-think situations.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When people annoy me, I may tell them what I think of them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I become nervous easily.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Extremely uncharacteristic of me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extremely characteristic of me</td>
<td></td>
</tr>
</tbody>
</table>

---

I am suspicious of overly friendly strangers.

I prefer to work in large groups.*

There are people who pushed me so far that we came to blows.

I often feel depressed.*

When people are especially nice, I wonder what they want.

I over eat when upset.*

Once in a while I can't control the urge to strike another person.

I am sometimes eaten up with jealousy.

I have trouble keeping friends.*

I get bored easily.*

I have threatened people I know.

I never apologize if I know I was right.*

I am an even-tempered person.

I am easily embarrassed.*

If somebody hits me, I hit back.

Sometimes I laugh without knowing why.*

I am often preoccupied with my appearance.*

When frustrated, I let my irritation show.

I have trouble making friends.*

I sometimes feel that people are laughing at me behind me back.

I have trouble remembering things.*

Given enough provocation, I may hit another person.

I have suddenly burst into tears.*
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely</td>
<td>Uncharacteristic</td>
<td>of me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Some of my friends think I'm a hothead.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know that &quot;friends&quot; talk about me behind my back.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I often feel as if I am the smartest person in the room.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get into fights a little more than the average person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people always seem to get the breaks.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I often think of running away and starting a new life. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tell my friends openly when I disagree with them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After waking up, my mood stays constant throughout the day. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can think of no good reason for ever hitting a person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I often fear being rejected by the people I care about. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have trouble controlling my temper.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I make fun of people because they are different. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can't help getting into arguments when people disagree with me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given enough provocation, I may hit another person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes I fly off the handle for no good reason.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At times I feel I have gotten a raw deal out of life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I often feel that other people are laughing at me rather than with me. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My friends say that I'm somewhat argumentative.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I sometimes feel like a powder keg ready to explode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have never had a problem controlling my emotions. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have become so mad that I have broken things.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowing a famous person would make me feel more important. *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wonder why sometimes I feel so bitter about things.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These next questions are about the video game experience as a whole.

1. How personally relevant was the content of the video game experience to you?
   
   Not at all  1 2 3 4 5 6 7 Very much

2. How was the picture quality during the video game experience?
   
   Very poor  1 2 3 4 5 6 7 Very good

3. How was the sound quality during the video game experience?
   
   Very poor  1 2 3 4 5 6 7 Very good

4. How comfortable were you with your viewing position?
   
   Not at all  1 2 3 4 5 6 7 Very much

5. How tired were you immediately after the game ended?
   
   Not at all  1 2 3 4 5 6 7 Very tired

6. Overall, how satisfying or enjoyable was the video game experience you just had?
   
   Not at all  1 2 3 4 5 6 7 Very much

The next questions ask about the game controls.

1. The game controls seemed natural.
   
   Strongly Disagree  1 2 3 4 5 6 7 Strongly Agree

2. The actions used to interact with the game environment were similar to the actions that would be used to do the same things in the real world.
   
   Strongly Disagree  1 2 3 4 5 6 7 Strongly Agree

3. The game interface was not realistic.
   
   Strongly Disagree  1 2 3 4 5 6 7 Strongly Agree

4. The game environment was manipulated in a lifelike manner.
   
   Strongly Disagree  1 2 3 4 5 6 7 Strongly Agree

5. The actions I performed with the controller were closely connected to the actions happening in the game environment.
   
   Strongly Disagree  1 2 3 4 5 6 7 Strongly Agree
6. The actions used to control the game seemed natural.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

The next questions ask how you felt during the game.

1. I focused on the game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

2. I concentrated on the game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

3. The game was rewarding.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

4. I lost consciousness during the game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

5. The game was moderately challenging.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

The next questions ask for your thoughts and opinions about the game you just played.

1. I liked this game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

2. I would recommend this game to my friends.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

3. I wish I could have played this game longer.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

4. I would like to play this game again.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

5. This was a fun game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

6. I would like to purchase this game.

   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree
Here are some statements about your video game playing ability. Please answer each using the scale provided.

1. I often win when playing videogames against other people.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. I often win when playing videogames against the computer.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. I am a good video game player.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. I think about different video game strategies.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. I can easily figure out how to play new games.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

6. I have no problem handling the multiple buttons on currently popular game controllers.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. I can play games with complicated control systems well.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

8. I have good video game playing skills.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

9. I am a better video game player than most of my friends.
   - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

10. I can finish video games quickly.
    - Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
APPENDIX C

*Note.* The questionnaire was given before the participant began playing the video game or took part in any manipulated sessions.
<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
</tr>
</thead>
</table>

**During an average WEEKDAY....**

How many hours do you spend playing video games by yourself? _____ HOURS

How many hours do you spend playing video games with another person or group? _____ HOURS

**During an average WEEKEND DAY....**

How many hours do you spend playing video games by yourself? _____ HOURS

How many hours do you spend playing video games with another person or group? _____ HOURS

**How experienced are you with each of the following game systems/platforms?**

Playstation 2
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

PS3
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Xbox
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Xbox 360
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Nintendo Wii
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Nintendo Wii U
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Nintendo 64 (N64)
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

Handheld video games
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced

PC video games
- Not experienced at all
- 1 2 3 4 5 6 7 Very experienced
Which platform do you play video games on MOST FREQUENTLY? (check ONE)

___Playstation 2
___PS3
___Xbox
___Xbox 360
___Wii
___Wii U
___N64
___PC/Computer
___Handheld (specify)_________
___Other (specify)_________

What video games are you currently playing MOST OFTEN? (list THREE including system)
1. __________________________________________
2. __________________________________________
3. __________________________________________

How experienced are you with first person shooter video games?

Not at all experienced 1 2 3 4 5 6 7 Very experienced

Which of the following phrases describes you? (circle one)

A. I spend most of my gaming time playing multiplayer games.
B. I spend a little more of my gaming time playing multiplayer games, than single-player games.
C. I spend the same amount of my gaming time playing multiplayer and single-player games.
D. I spend a little more of my gaming time playing single-player games, than multiplayer games.
E. I spend most of my gaming time playing single-player games.

Do you have any prior experience playing *Perfect Dark*?

Yes    No
APPENDIX D

Notes. All participants were given two copies of the consent form. One copy was signed by the participant, prior to his or her participation in the research, and kept by the researcher. The other copy was given to the participant for his or her records. Contact information has been redacted.
Consent Form

You are being asked to take part in a research study of how videogames affect emotion. We are asking you to take part because you signed up during a Psychology/Communications class. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

What the study is about: The purpose of this study is to learn how student’s emotional responses are affected by videogames.

What we will ask you to do: If you agree to take part in this study, you will be taught the controls to a videogame and then play a 15 minute session of a competitive 4-player free-for-all game mode. You will then be asked to answer some questions about your experience.

Risks and benefits: There is the risk that you may find the violence in the videogame to be offensive or disturbing. The game is rated “M” for Mature (ages 17+) by the Entertainment Software Rating Board for animated blood and animated violence.

There are no real benefits from the study other than helping the field of videogame research.

Compensation: You may earn extra credit if you are taking a class that offers credit for research studies. The class instructor will assign credit according to class policy.

Your answers will be confidential: The records of this study will be kept private and there will be no identifying information with the data. In any sort of report we make public we will not include any information that will make it possible to identify you. Research records will be kept in a locked filing cabinet; only the researchers will have access to the records.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide to take part, you are free to withdraw at any time.

If you have questions: The researchers conducting this study are Chris Hawk and Dr. Steven Slane. Please ask any questions you have now. If you have questions later, you may contact Chris Hawk at [contact information], or at [contact information]. Dr. Slane can be reached at [contact information]. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) at (216)687-3630.

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature ___________________________ Date ______________________

Your Name (printed) ________________________________________________
APPENDIX E

Note. All participants were sent the full debriefing, via email, once all data collection had finished.
Thank you for your participation in this study. In recent years, much research has been done on the topic of violent video games and its relation to aggression. Both parents and policymakers have become worried about violent video games, even more so than TV and music violence (Anderson et al. 2003). This is understandable as many popular video games contain violence where the player is an active participant, as opposed to a passive participant when watching TV violence or listening to violent music (Anderson et al. 2003). However, many studies to date have left out a very crucial variable: the competitive aspect of the games and the frustration inherent in the competition.

The study you participated in was measuring aggression in relation to how frustrated players got while playing a violent video game competitively. My thought was that the frustration inherent in playing a competitive game against others is the cause of aggression while playing a violent video game. This research could shed new light on what causes players of violent video games to become aggressive or have increased levels of aggression.

Due to the nature of the measures and material being studied, deception was a necessary component of this research. When you first arrived you were told that the study was about video games and emotion. The study was about frustration when playing a violent video game competitively.

Also, when you arrived you were told that you would be playing AI controlled bots. In order to guarantee frustration, all participants were randomly assigned to either a high frustration group or a low frustration group. The low frustration group played bots set to an easy difficulty and the high frustration group played bots set to high difficulty.
Please understand that being deceived during the study does not reflect negatively on you. All it means is that I did a good job of making up a credible cover story. A lot of time and effort went into making the cover story as credible as possible. Some people find participation in a study involving deception to be disturbing. If you feel uncomfortable having been deceived, you may withdrawal your data from the sample. If you choose to withdrawal, your data will not be used any further. Please keep in mind that your data will be kept confidential and all results are published anonymously as group data.

If you have any concerns as to how the research was conducted or if you would like to see the results when the study has concluded you may contact myself or Dr. Slane (phone numbers and email addresses are on the consent form you received at the beginning of the study). Again, thank you for your participation.