The Effects of Violence in Video Games on Individual Levels of Hostility in Young Adults

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THE EFFECTS OF VIOLENCE IN VIDEO GAMES ON INDIVIDUAL LEVELS OF HOSTILITY IN YOUNG ADULTS

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THE EFFECTS OF VIOLENCE IN VIDEO GAMES ON INDIVIDUAL LEVELS OF HOSTILITY IN YOUNG ADULTS

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To my parents, close friends, and mentors, without whom the completion of this degree would not have been possible.
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THE EFFECTS OF VIOLENCE IN VIDEO GAMES ON INDIVIDUAL LEVELS OF HOSTILITY IN YOUNG ADULTS

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For a while, video games have been the target of scrutiny with regards to their perceived potential to adversely affect younger individuals. In particular, it is often argued that these video games, particularly those of violent nature, may increase hostility to an extent that it manifests itself in violent behavior. This thesis aims to denote what effects these video games have on young adults, particularly in relation to the respondents’ indicated extent of adverse childhood experiences, trait anger, and competitiveness, all three of which were assumed to have a positive relationship with hostility. A survey was distributed to students attending Western Kentucky University in an attempt to measure what effects these three aforementioned variables have on young adults, in addition to what affects video game playing and violence in video games may have on hostility and aggression. From the data acquired, it was clear that while adverse childhood experiences had no statistical significance in this study and higher competitiveness indicated a very slight decline in hostility, trait anger did in fact appear to raise hostility in the respondents. Additionally, increases in exposure to both video game play and violence in video games were shown to lead to a decrease in hostility. From this, it would appear that trait anger was the only variable to truly increase hostility in young adults, and the often-discussed variables of video game play and violence in video games both appear to decrease hostility in respondents as exposure to either factor increases, thus going against the common assumptions.
CHAPTER I
INTRODUCTION

Violence is detrimental, having disruptive effects for both the individual and society. For the individual, observed violence can increase hostile cognitions and aggressive tendencies, and thus decrease socially cooperative behavior (Carnagey & Anderson, 2005). For society, its effects may be even more devastating, as observed violence can potentially be internalized and manifested as performed violence (Anderson & Bushman, 2001). Thus, one function of society must be to curtail violence, or at least channel it into less destructive forms.

Social scientists have looked for factors that increase the likelihood of violent behavior with the idea of predicting, preventing, and controlling such behavior. Social psychologists have been particularly focused on how violent behavior is internalized during the socialization process (e.g., Carnagey & Anderson, 2005). Many agents of socialization have been examined for protective and preventive factors, but the effect of media on violence has been of particular interest (Felson, 1996) and has a long history, perhaps beginning with Wertham’s (1954) attack on comic books as a cause of juvenile delinquency. Video games are the most recent media form to be examined.

Video games are common in today’s society. Overall, approximately 155 million Americans play video games, with 51% of U.S. households owning a dedicated video game console (Entertainment Software Association, 2015). Furthermore, 42% of Americans play video games three hours or more per week (Entertainment Software Association, 2015). Also interesting is the fact that the average age of video game players is 35 years old, although people of all ages play video games at similar rates; while 30%
of video game players fall in the ages of 18 – 35, 27% are 50 years or older, while 26% are less than 18 years and the remaining 17% are 36 – 49 years old (Entertainment Software Association, 2015). Video games are too ubiquitous as a form of entertainment in today’s society to ignore their potential social effects, negative or positive.

What effects, if any, competition and simulated violence in video games may have on hostility is a topic widely discussed and studied. If violent or competitive video games can adversely affect those who play such games, these adversely-affected individuals cannot optimally fulfill their larger function in society, given their relative inability to cooperate. If violent or competitive video games physically manifest hostility, players of particularly violent games may become destructive to the society as a whole, especially as the video games proliferate.

This paper consists of a literature review and analysis of data collected by survey. The literature review examines previous studies of violence and competition in video games and hostility. Beyond this, literature is presented that indicates the effect of adverse childhood experiences, competition, and one’s predisposition to violence, particularly as the result of trait anger. Within this study, I examine the effects of video game play on young adult hostility regarding the aforementioned variables. This study utilizes a unique survey created specifically for this study and distributed to students at Western Kentucky University.
Before going further, the terms “aggression” and “hostility” need to be clearly defined as they are used frequently in this study. They have not been clearly defined in previous studies. Here, aggression refers to any behavior directed toward someone else carried out with the intent of causing physical harm (Anderson & Bushman, 2002), while hostility is a negative attitude toward individual(s), often joined with a feeling of disgust and contempt (Ramirez & Andreu, 2006). Noting that hostility is an attitude, while aggression refers to behavior is important. The hypothesized relationship between these concepts and the underlying causes are presented in Figure 1.

Figure 1 suggests that hostility and aggression follow a set trajectory. It is assumed that an individual’s ascribed characteristics (i.e., their demographics) will affect their lived experiences as well as the presence and intensity of trait anger in the individual and thereby influence their attitudes and behaviors. Trait anger is the “disposition to experience angry feelings as a personality trait” (Spielberger, 1999), while adverse experiences are considered things like childhood abuse, neglect, and household dysfunction (Dube et al., 2003). These two variables may feed into one’s consumption of violent media, though it is likely that one’s trait anger may be influenced by his or her own previous adverse childhood experiences. The selection and consumption of violent media is then depicted to influence one’s level of hostility, though hostility would be affected by one’s trait anger as well. This level of hostility then affects the likelihood that the individual will act aggressively.
Research on Video Games Showing Increases in Hostility and Aggression.

Many researchers have provided support for a positive relationship between violence in video games and hostile tendencies. A relationship has been observed, for example, between several indicators of hostility and violent video game exposure and preference. Young adults who played more violent video games were involved in more arguments with teachers, participated in more physical fights, and achieved higher scores on hostility scales than those who did not play or played fewer violent video games (Gentile et al., 2004). Further, a study conducted by Willoughby and Adachi (2012) showed data that suggested an increase in aggressive behavior for those with extended periods of sustained violent video game play as compared with those who did not play as long. Interestingly enough, nonviolent video game play “did not significantly predict aggression scores” (Willoughby & Adachi, 2012, p. 7).

Lastly, data has suggested that short-term exposure to violent video games will increase hostility, at least temporarily; according to this study, a correlation between
aggression in the real world and violent video game play exists (Anderson & Bushman, 2001). Other studies have noted a corresponding decline in prosocial behavior, meaning that prolonged exposure to violent video games resulted in less prosocial behavior (Anderson & Bushman, 2001). Thus, antisocial behaviors like hostility and real world aggression are evidently spurred in part by violent video game play while prosocial behavior is retarded.

Carnagey and Anderson (2005) examined what effects rewarding and punishing violent actions in video games had on their players, relative to aggressive affect, aggressive cognition, and aggressive behavior, found that with all three aspects of aggression, rewarding actions deemed violent resulted in a higher tendency to feel hostile, experience more aggressive thoughts, and act aggressively. However, punishment of these violent actions in the video games only seemed to increase hostile emotions. When actions were punished in these violent video games, subjects exhibited no apparent change in aggressive thinking or behavior. Therefore, one might infer that, based on these data, those who are punished for violent actions in video games may not exhibit heightened levels of hostility, while those who are rewarded for the same sorts of behaviors may be more hostile than average (Carnagey & Anderson, 2005).

**Research on Video Games Showing No Increases in Hostility and Aggression**

Although many studies have found that violence in video games influences hostility, others suggest that in-game violence itself is not what causes hostility in video game players. In fact, some studies indicate that violent video games may be beneficial to their players. In a study conducted by Christopher Ferguson (2010), subjects were
exposed to a frustrating task. Following this, sets of subjects were exposed to either no game, a nonviolent video game, or a violent video game. Subjects who were given the violent video game stimulus on average had lower observed levels of hostility as well as lower levels of depression (Ferguson 2010).

Notably, in the 2010 study conducted by Bösche, when comparing habitual players with a control subset, consisting of those who did not habitually play video games, those who played nonviolent video games habitually were less frustrated after playing such games than those who did not habitually play nonviolent video games. This is contradictory to the assumption made in the same study that increased exposure to violent video games led to increased frustration. Even more interesting is the fact that these habitual nonviolent video game players showed a higher rating of frustration, after playing their respective types of games, than those who habitually played violent video games. On a scale from 1 to 4, habitual nonviolent video game players were rated at 1.88 for frustration with a standard deviation of 1.13, while habitual violent video game players were rated at 1.50 with a standard deviation of only 0.84 (Bösche, 2010).

Markey and Markey (2010) analyzed another aspect to this debate. These researchers sought to discover what made one person more vulnerable to the effects of a violent video game than another. The researchers utilized the Five Factor Model, a psychological frame used to measure the human personality, in comparison to the traits common between the model and violent video games, neuroticism and agreeableness. Markey and Markey were then able to predict which subjects would be adversely affected by violent video games. They declared that those who are adversely affected have a psychological predisposition that caused the participants to be more inclined to
experience hostile tendencies than those who are not noticeably affected. In short, what these researchers found was that a predisposition to be affected by violent video games was more to blame than the violence itself (Markey & Markey 2010).

The Role of Adverse Childhood Experiences

Adverse childhood experiences (ACEs) are negative or otherwise detrimental occurrences and realities present during an individual’s first 18 years of life. Criminologists argue that ACEs may affect an individual’s predisposition toward hostility and aggression as well as other life chances and outcomes. The original ACEs Study’s overall objective is to “assess the impact of numerous, interrelated ACE’s (adverse childhood experiences) on a wide variety of health behaviors and outcomes” (Dube et al., 2003, p. 565). Based on information obtained using their questionnaire, one’s experiences as a child, particularly those adverse in nature, may negatively influence the individual, even into the individual’s adult years.

From Dube et al.’s (2003) findings on ACEs, some details and assumptions may be ascertained. First, noting that this study’s aim was to show to what extent, if any, ACEs were related to early, illicit drug initiation is important. This study ultimately found that individuals who disclosed ACEs were more likely to have started using drugs at an early age (Dube et al., 2003). More specifically, Dube et al. (2003) asserted that each ACE category “increased the likelihood of drug initiation during mid-adolescence and adulthood” (p. 567). These researchers add that each individual category of ACE “increased the likelihood of early drug initiation 2- to 4-fold, and also increased the likelihood of lifetime use” (Dube et al., 2003, p. 567).
This finding is important for the purposes of this study partially because it implies a negative emotional change among individuals with ACEs. This potentially means that these individuals are turning to drugs because of depression onset by their experiences before the age of 18. Additionally, these findings broaden the apparent probability that individuals with ACEs may act out in other ways beside illicit drug use. As such, this introduces the question of whether ACEs may predispose and prime an individual to becoming hostile.

An additional consideration regarding ACEs is the neighborhood in which the child lives during their formative years. In particular, if the place is plagued by regular violence, this has also been shown to have an adverse, lasting effect on the individual. Neighborhood violence is common, with estimates showing that “50% to 96% of children and adolescents who reside in urban areas are exposed to some form of violence in their neighborhoods” (Fowler et al., 2009, p. 227). The apparent effects of place-based violence are important to consider, especially regarding how violence may dispose an individual toward hostility.

Regarding the findings on local violence, it has been noted that externalizing problems, including deviant and aggressive behavior, seem to result from early exposure to place violence (Fowler et al., 2009, p. 228). Neighborhood unrest has been shown to lead to the development of PTSD symptoms. Violent places have been “compared to war zones in which there is no foreseeable end to the combat” (Fowler et al., 2009, p. 248). This means that the young individuals living in violent localities often feel at risk for victimization in the form of robberies, gang activity, beatings, stabbings, and shootings.
(Fowler et al., 2009, p. 248). This may lead to internalizing these feelings and carrying them forward into adult life.

Social cognition theories propose that exposure to violence “normalizes the use of aggressive behavior” and can teach youths that “violence is an effective method of problem solving” (Fowler et al., 2009, p. 248). It is theorized that these individuals are more likely to act aggressively because they are modeling the violence in their childhood neighborhood as an appropriate behavior (Fowler et al., 2009). In this sense, the aggression is adopted by the individual and utilized toward his or her own ends. This suggests a direct link between community violence and aggression. Although the model utilized in this study supposes hostility as a necessary precursor to aggression, it is possible that aggression itself is influenced by one’s experiences in a violent neighborhood as a child. In short, it seems that if an individual grows up in a violent neighborhood, the individual may accept the violence as necessary or acceptable and potentially adopt similar aggressive tendencies in his or her own life.

**Trait Anger**

Trait anger, as previously noted, is one’s predisposition to experience angry feelings, and is considered a personality trait (Spielberger, 1999). Trait anger in itself may have the potential to heighten a person’s readiness to act aggressively when instigated (Maldonado et al., 2015, p. 1114). In fact, one study found that trait anger, beyond childhood physical abuse and alcohol consumption, was related positively to intimate partner aggression (Maldonado et al., 2015, p. 1121). This indicated that the relationship between trait anger and intimate partner aggression “was modified by the
distal impellor of childhood physical abuse and the disinhibition factor alcohol consumption,” and overall, higher levels of trait anger were related to greater intimate partner aggression perpetration (Maldonado et al., 2015, p. 1121). While the study to be conducted does not deal specifically with matters of intimate partner aggression, the Maldonado et al. study (2015) just referenced suggests a linkage between trait anger and aggression. While the Maldonado et al. (2015) study solely focuses on intimate partner aggression specifically, trait anger should affect overall aggression in some measurable way.

**Competition**

Competition can be best conceptualized as any interpersonal act that involves one person striving to somehow best the other or others involved. Sports psychologists break this down into two separate components: performing well and a winning outcome to the game (Gill et al., 1991). Competition in video games often involves a single player or team of human players seeking to outplay others in their game world with the ultimate goal of being victorious. In fact, competition often has the potential to extend past the emphasized competition with the focus on some scoring system. In this, users on a winning team may feel a desire to be the best player on their own team, aiming to have the highest score, the best time, or otherwise be the “MVP.” Even past this level of competition, video game players may feel the pressure through leaderboards or other ranking systems to be the best. Ultimately though, competition always involves both playing well and winning although individuals differ on which of those two aspects is more important—this is what Gill et al. (1991) term competitive orientation.
There is a shortage of data on the way that competitive orientation affects play, including video game play. Moreover, competition in video game studies has usually been conceptualized differently than sports psychologists. However, what is known seems to draw a connection between violence in video games and hostile behavior. In a unique study, Adachi and Willoughby (2011) observed the differences between the effects of noncompetitive violent video games and competitive violent video games on their respective players. Violence in these games varied, but the results remained the same. The findings of the experiment indicated that playing nonviolent video games caused no more or less aggression than playing noncompetitive violent games. Beyond this, competitive games appeared to elicit more noticeably hostile behaviors, despite the violence present in the games. The data found in this study implies that competitiveness in video games could very well be the cause for increased hostility, rather than the violence of the video game itself.

Conversely though, Jansz (2005) argues that competition may be therapeutic for video game players. Video games, violent ones in particular, may serve to satisfy a basic human need for competition, thus not increasing hostility necessarily but acting to placate an innate desire (Jansz, 2005). However, since there is little literature available on the cathartic aspects of video game play, further studies will be necessary to determine to what extent, if any, competition in video games affects hostility. This is a gap that my study hopes to fill.

Regarding competition itself, there might be a link between hostility and interpersonal conflict. On one side, it may be argued that conflict and competition can help improve intragroup relations. Competition, in this sense, “eliminates the
accumulation of blocked and balked hostile dispositions by allowing free behavioral expression” (Coser, 1956, p. 39). It is argued that without ways to vent hostility, members of a group may react accordingly through withdrawal (Coser, 1956, p. 47). However, by having conflict that allows these group members to express their feelings of hostility against other group members, the relationship may in fact be maintained (Coser, 1956, p. 48).

Competition does not require hatred of an enemy. Games may only require individuals to play well to progress toward their goal of winning (Coser, 1956, p. 58; Simmel 2008); however, other games may require attacks on the enemy to play well and/or to win. Presumably, this form of competition may apply to video games as well, particularly those that simulate war or encourage warlike, team-based combat. Coser (1956) asserts that combat motivation primarily consists of “loyalties to the group of buddies” rather than hatred of the enemy (p. 58). In this regard, one may argue one of two points: First, this may suggest that competition, particularly when it involves cooperative groups, breeds hostility against the enemy by nature of the enemy’s threat to an individual participant’s friends (Sherif, 1954). Second and conversely, this fact may indicate that competition does not lead to hostility at all; an individual competitor may be more focused on cooperating with friends toward an end goal than they are focused on hatred for their enemies. This study will aim in part to see how this notion applies to the realm of video games, as well as to see if intragroup cooperation does play some part in increasing or decreasing hostility.

Theoretical Perspective
The symbolic interactionism perspective shines light on why competition and violence may not always create hostility in young adults. Here, I believe the subjective symbols present in any competition, through the text-based language and images used, the way that success or failure are described as an objective, the occasional communication experienced among players, and the inevitable labeling process undergone during each of these separate elements, can very easily create a hostile definition of the situation that adversely affects the user.

The looking-glass self is the most specific concept from which I am viewing this topic. Created by Cooley (1902), the concept of the looking-glass self refers to a more social self, one that arises from how the individual believes others perceive himself or herself to be (Manis & Meltzer, 1978). I believe this relates to the impact of competition in video games on hostility in young adults for two reasons: First, in a competitive scenario, it is inevitable that any participant will be at odds with at least one other participant. While it may be important that the individual participant views those on the opposing side as “enemies,” or something similar, it is more important that the individual acknowledges the fact that he or she is simultaneously being acknowledged as such from the opposition. This can result in the individual perceiving his or herself as an enemy, resulting in higher aggression and possibly frustration given the stigma of being a “bad guy,” or potentially as a hero or “good guy,” which could result in more motivated aggression on one end of the spectrum or lessened aggression on the other. Such motivation toward aggression could stem from a sense of obligation or duty as a heroic archetype. The lessened aggression may occur due to the self-perception of being good leading the player to take on a persona of the calm, collected hero. Similarly, aggression...
could be less if perceived as a hero because of a lack of guilt that could otherwise lead to frustration.

**Current Study**

For this study, I look further into the relationship between video game play and hostility and aggression in young adults. In particular, I attempt to determine to what extent, if any, adverse childhood experiences, competitive orientation, and trait anger impact observed levels of hostility and aggression in video-game-playing young adults. The full set of relevant concepts for this study are violence in video games, trait anger, adverse childhood experiences, competitive orientation, hostility, and aggression. These concepts were measured by survey, distributed to a random sample, that includes a variety of questions and scales that should measure the competitive nature and violent nature of video games played by individual respondents, as well as the hostility common for the respondents relative to their exposure to video games, violent and nonviolent.

**Hypotheses**

Hypothesis 1. The more adverse childhood experiences a person has undergone, the more likely they are to be hostile.

Hypothesis 2. The more trait anger a person exhibits, the more likely they are to be hostile.

Hypothesis 3. The more competitive a person is, the more likely they are to be hostile.

Hypothesis 4. The more hostility a person reports, the more aggression they will report.
CHAPTER III

METHODOLOGY

This study was conducted using a sample of young adult Western Kentucky University students. Young adults were conceptualized as those individuals older than 18 years of age and younger than the age of 35. Given that the total population of Western Kentucky University students was approximately 20,500 students as of 2013 (Helbig, 2014), this study aimed for a sample size of at least 377 students. This figure was determined using a 95% confidence level with a 5% confidence interval and allowed for a high degree of generalizability, while still being feasible given the time span of the study and the available methods of sampling. The survey utilized by this study was sent out through the University to all students enrolled. No particular subset of this population was purposely oversampled. After two email invitations to participate in the study, 730 individuals responded. After removing incomplete responses, there were 346 participants in the study.

This sample responded to a survey created specifically for testing the hypotheses of this study. While one reason for conducting a more customized survey is that doing so allows for more control over which concepts were included and how they were measured. This survey measured the extent to which respondents play video games, the violence in these video games, and the competition in these video games. It also measured how predisposed respondents are to being hostile as well as how video games affect their perceived levels of hostility. No other study had included all these measures.

Generalizability of Data
As with any study, there is a question as to the extent to which the data is
generalizable to its target population. Additionally, as missing data arises, particularly in
a study utilizing case-wise deletion, an additional question may arise in turn: Does the
elimination of missing data skew or substantially alter the makeup of the sample? To
determine all of this, Table 1 has been constructed. This table compares the final 346
cases present following the elimination of missing data to both the 436 total cases present
for respondents who made it to the end of the study, since the end of the study is where
these respondents would have answered questions on demographics, and to the Western
Kentucky University Factbook for 2017 (Helbig, 2017), which contains data for the year
this study’s data was collected.

Table 1. Demographic Comparisons for Final Sample vs. Sample Prior to Case-Wise
Deletion vs. WKU Factbook

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Mean (Std. Dev.)</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Final</td>
<td>Pre-Deletion</td>
<td>Book</td>
</tr>
<tr>
<td>Sex (Male)</td>
<td>47.7%</td>
<td>45.0%</td>
<td>41.1%</td>
</tr>
<tr>
<td>Race (White)</td>
<td>88.4%</td>
<td>86.7%</td>
<td>77.0%</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Income</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Both undergraduate and graduate data amalgamated for WKU Factbook

Note 2: Hyphens placed where data is not applicable or not available

In Table 1, it was possible to contrast this study’s final sample and the Factbook-
reported WKU population with regards to the demographic variables of sex, race, and
The final study showed 47.7% male participation, 88.4% white participation, and a median age of 21. Reported in the Factbook was a 41.1% male population, 77.0% white students in the population, and the greatest quantity of the population fell into the “Twenties” age distinction. While the final study does deviate slightly from the Factbook-reported population of WKU at the time the survey was distributed, one may argue that the deviation was not substantial enough to argue that it impacted generalizability to a notable extent. As for the differences prior to and following missing data deletion, the differences are even less substantial. With a 2.7% difference in sex makeup, a 1.7% difference in white representation, and a .615 years difference in mean age, it seems that not much changed demographically from before case-wise deletion to after.

Measures

The dependent variables focused on for this study are hostility and aggression with additional independent variables that examine violent nature of games, the competitive orientation of respondents, trait anger levels in respondents, frequency and extent of adverse childhood experiences faced by respondents, time spent using digital media, and demographic information. Preconceptions were also measured as a means to determine to what extent respondents personally believe video games affect hostility. This was done to measure bias, as this topic has the potential to be highly controversial among certain respondents. By variable category, the responses were compiled into a scale that measures the respondents accordingly.
Dependent Variables

Hostility. The violent nature of the respondent was measured using several indices (The complete survey is available in Appendix I.). Respondents were given a set of statements created by the author and judged to measure hostility, such as “I am generally more argumentative while playing video games” and “playing video games is something I do to calm myself down.” The response categories were Likert scale, running from “strongly agree” to “strongly disagree.” Based on each statement, the response indicating the most non-hostile nature will be coded at 1, while those indicating a most hostile nature will be coded at 5. For example, the first given prompt, “I am generally more argumentative while playing video games,” would have “strongly agree” coded at 5, as that would indicate the highest level of indicated hostility, while the second prompt, “playing video games is something I do to calm myself down,” would have “strongly agree” coded at 1, as agreement with this statement would indicate lower hostility rather than higher hostility.

Additionally, questions taken from the Stress and Eros Hostility Questionnaire (Roeder, 2011) were also used. The intent of the Stress and Eros Hostility Questionnaire (Roeder, 2011) is to measure respondents across multiple categories of hostility and aggression and amalgamate their responses into one base score for each concept. While used in the original questionnaire, questions regarding a third category, cynicism, were excluded in this study.

The version of this questionnaire to be used in this study will focus on two of the categories from the original battery of items, including anger, which is defined in the original questionnaire as an emotion begotten by a person’s expectation of unacceptable
behavior on the part of others, and aggression specifically manifested by the hostile
emotions of anger and irritation (Roeder, 2011). These questions each have binary
response categories, meaning that the respondent can only choose one of two possible
answers to each prompt.

To measure hostility, the items linked to the anger subset will be singled out. Then, in each case that the response agrees with the response in the original scoring key, that response will be coded at 1, with all other responses coded at 0. The responses listed in the key, provided in the format of question number (response letter), are as follows: 7 (B), 10 (B), 12 (B), 15 (B), 17 (A), 19 (A), 21 (A), 22 (B), 26 (A), 28 (A), 30 (A), 31 (B), 33 (A), 35 (B), and 37 (A) (Roeder, 2011). Similarly, the key responses for hostility-driven aggression are as follows: 8 (A), 9 (B), 11 (A), 13 (B), 14 (A), 16 (A), 18 (B), 20 (B), 23 (B), 24 (A), 25 (B), 27 (B), 29 (B), 32 (B), 34 (A), and 36 (B) (Roeder, 2011). These were used to develop an aggression measure.

After item responses were coded, they were summed to develop their respective scales. If the resulting score is seven or less, researchers suggest that the respondent’s hostility level is below the range where placing the respondent at risk of developing health problems is likely, while any score above seven would thus indicate a potentially harmful level of hostility (Roeder, 2011). Each category in the original questionnaire had 15 questions included, excluding aggression level, which included 16. Ergo, to stay as true to the original questionnaire as possible, an approximate third of the benchmark was subtracted, estimating the difference to seven both to keep the analysis and presentation of results as clear as possible as well as to attempt to properly account for the additional question in the hostility-driven aggression category.
Aggression. Physically-manifested aggression was measured by the Buss Perry Aggression Questionnaire (Buss & Perry, 1992). These questions utilize a Likert-type scale, including the categories “extremely uncharacteristic,” “somewhat uncharacteristic,” “neither uncharacteristic nor characteristic,” “somewhat characteristic,” and “extremely characteristic,” presented in the same order as written here. For these questions, a response of “extremely uncharacteristic” will be coded at 1, while “extremely characteristic” will be coded at 5. To acquire the overall physical aggression score of the respondents, the mean of these scores will be taken. This mean score indicated higher levels of aggressiveness the closer it is to the maximum possible value, 5. A score of 1 indicated low overall aggressiveness, while a score of 5 indicated very high overall aggressiveness, with all scores between these two extremes falling along the gradient appropriately.

Independent Variables

Demographics. The primary demographics variables for this study’s purposes are sex, age, and income. Sex is coded at “0” for female and “1” for male. As for age, the respondents were given a selection from a set of ages, beginning with “younger than 18” and spanning to “31 or older,” including in-between each age from 18 to 30 as its own category. Additionally, income was measured by 7 categories, each coded from “1” to “7” from lowest to highest income. These categories included from “less than 25,000” to “more than 100,000,” with the categories falling in-between measuring different levels of income, including “$25,001 – $40,000,” “$40,001 – $65,000,” “$65,001 – $85,000,” and “$85,001 – $100,000.”
Violence in games. One initial way violence in video games was measured was through an open-ended question asking the three video games played most often. The violence of these games was determined objectively and coded based on the presence of blood, gore, physical harming of enemies, and the ESRB rating. The presence of the first three aspects will be dummy-coded, with 0 signifying a no presence and 1 signifying some presence, determined by objective descriptions of the game obtained primarily through videos found during the analysis of this question. The ESRB rating will be coded from 1 to 4, with 1 including “E for Everyone,” 2 including “T for Teen,” and 3 including “M for Mature.” With an “AO for Adults Only” rating, the game will be further investigated as to whether this is because of sexual content or excess violence. If a high rating was exclusively due to sexual content rather than content of a violent nature, the game will be coded at 1.

A dichotomous violence variable was created by coding all games rated E for Everyone as “0,” while all games rated T, M, or AO were rated as “1.” T was used as a baseline for when violence begins to become a factor in video games as it has been found that around 98% of games rated T already feature violence in the gameplay (Haninger, 2004). This variable will be used in some of the later analyses.

More generally, the respondent was asked about the ESRB rating of their most frequently played video game, which will be coded in the same manner as mentioned previously. Another set of Likert-scale based questions will be given, such as “my favorite video games involve me shooting or otherwise physically harming my opponents” and “the video games I play most often contain blood and gore,” coded from
1 to 5 with 1 referring to responses that weakly indicate violence and 5 referring to responses strongly indicating violence.

*Preconceptions.* A third set of variables to be considered, although not a main focus of this study, was the respondents’ preconceptions toward the effects, widespread and personal, of video games. This was measured as a means to determine potential respondent bias in survey responses as well as to get an idea of general opinions among the sample of what they believe to be the effects of video game exposure. To collect data on this, a set of Likert questions, coded from “strongly agree” to “strongly disagree,” were administered. In this, the respondents were given a set of statements to which they must state their level of agreement. For this set, responses of “strongly disagree” would indicate a standpoint that video games have no negative effects and would be coded at 1, while responses of “strongly agree” indicate that the respondent believes video games do have significant negative impacts and would be coded at 5. This coding allowed data to be collected by level of agreement, with higher values meaning higher agreement. These questions asked respondents’ feelings on the effects of violent video games. An example of statements for use with the Likert scale was “violent video games lead to real life violence” and “violent video games should be more heavily regulated.”

*Time spent using digital media.* To understand the lifestyles of the respondents better, a matrix of questions was administered that measured how often respondents used the internet, watch television, utilize video streaming services, and play video games. While the extent to which people play video games was perhaps the most important aspect to measure, the rest were measured simply as a means to determine dependency on digital media as a whole. These were measured on a basis of hours, segmented into
options of “less than 1 hour,” “1 to 3 hours,” “4 to 6 hours,” “7 to 9 hours,” “10 to 12 hours,” and “more than 12 hours.” These, excepting the final category, were coded by the common increment of 3, were coded at their midpoints, at 0.5, 2, 5, 8, 11, and 14, respectively. Additionally, the most commonly played systems will be determined as means to see what quantity and types of systems were played by respondents.

Competitive Orientation. Competitive orientation was measured by Gill et al.’s (1991) 4-item version of the Competitive Orientation Inventory (COI). This is a shortened version of the 16 item COI that Vealey (1986) had developed to assess athlete orientations toward performing well and winning. The four items used examined how satisfied individuals are in four conditions: playing well and winning, playing poorly and losing, playing well and losing, and playing poorly and winning. Respondent satisfaction with each condition was measured on a scale from 0 to 10 with 0 being “highly dissatisfied” and 10 being “highly satisfied”. Using Gill et al.’s methodology, performance and outcome scores was calculated by subtracting the two perform-poorly ratings from the two perform-well ratings for a performance score and the two loss ratings from the two win ratings for an outcome score. Lastly, a performance orientation score was calculated by subtracting the outcome score from the performance score. If playing well is more important, this score will be positive. If winning is more important, the score will be negative.

Adverse Childhood Experiences. To determine the level of ACEs, the Adverse Childhood Experiences Questionnaire was used directly and paraphrased when necessary. All questions from this questionnaire were measured using binary “yes” and “no” categories. Similar to the ACE Questionnaire (National Council of Juvenile and Family
Court Judges, 2006), the “yes” responses were coded as 1, with the “no” responses being coded as 0.

The ACE scale was created by standardizing each item, multiplying each item by their factor score (derived from the factor analysis used to check internal consistency), and summing the items. A higher score indicated a higher frequency of ACEs for the respondent.

Looking at the univariate statistics, it was readily apparent that the ACE scale was skewed. When checking respondent frequencies of ACE, one of the first things that was noticed was a skewness of 2.455. This indicates that the respondent scores for ACE were heavily positively skewed. Under closer scrutiny, 38.4% of the respondents’ scale scores were the minimum value of ACE scale, with an additional 54.0% scaling the next smallest increment. All of this indicates that a very high quantity of respondents in this study faced relatively little to no adverse childhood experiences. It is important to note the skewness and lack of variation in this variable in this sample may mean that the ACE scale may not correlate well with other variables.

**Trait Anger.** Trait anger was measured with the Displaced Aggression Questionnaire (Denson et al., 2006). These questions utilized a Likert-type scale, including the categories “extremely uncharacteristic,” “somewhat uncharacteristic,” “neither uncharacteristic nor characteristic,” “somewhat characteristic,” and “extremely characteristic,” presented in the same order as written here. For these questions, a response of “extremely uncharacteristic” will be coded at 1, while “extremely characteristic” will be coded at 5. As with this study’s use of the Buss Perry Aggression Questionnaire (Buss & Perry, 1992), the mean of these scores was taken, with the mean
indicating an overall level of trait anger for the respondent. Reasonably, a score of 1 indicated an overall low level of trait anger, while a score of 5 indicated an overall high level of trait anger.

**Analysis Plan**

After data cleaning to remove cases with inordinate missing data and to deal with outliers (Mertler and Venetta 2001), I worked to create indices of each concept of interest. Both factor and reliability analyses were conducted to determine if variables that were expected to scale together were actually correlated to one another. In each case but one, the factor analysis produced a single, unified factor. The indicators of only one concept, aggression, separated into two factors. These findings resulted in splitting aggression into two indices with one set of variables measuring “verbal aggression” and the other set “physical aggression.” Once factor analysis was complete, the scores for each index were then summed in a manner such that higher values would indicate higher frequency or severity. Once the variables were cleaned and recoded and scales created, t-tests, a correlation analysis, and path analysis were conducted as the primary means of hypothesis testing.
CHAPTER IV

RESULTS

This study gathered considerable information regarding the potential effects of violence in video games and hostility in young adults. In conducting this study, a set of other mediating factors was also added into the mix. Specifically, one’s ACEs, competitive orientation, and exhibited levels of trait anger were examined regarding how these variables may predispose an individual to greater levels of hostility, either before or because of violent video game play. By carefully analyzing and interpreting the data collected during this study, the correlations among these variables were ascertained and preliminary tests of hypotheses undertaken.

T-Testing Video Game Play and Violent Video Game Play

With regards to the effects of video games and violence on the variables of this study, it was deemed necessary to calculate a set of t-tests based on both the variable of whether or not the respondent plays video games on trait anger, ACE, competitive orientation, hostility, verbal aggression, and physical aggression, and on the variable of violence on trait anger, ACE, competitive orientation, hostility, verbal aggression, and physical aggression. These tables are shown below.
Table 2. Video Game Play on Means of Trait Anger, ACE, Competitive Orientation, Hostility, and Aggression.

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do you play video games?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trait Anger</strong></td>
<td>.083</td>
<td>-.013</td>
</tr>
<tr>
<td><strong>ACE</strong></td>
<td>-.299*</td>
<td>.046*</td>
</tr>
<tr>
<td><strong>Competitive Orientation</strong></td>
<td>-5.652*</td>
<td>-1.433*</td>
</tr>
<tr>
<td><strong>Hostility</strong></td>
<td>10.196*</td>
<td>7.467*</td>
</tr>
<tr>
<td><strong>Verbal Aggression</strong></td>
<td>.062</td>
<td>-.009</td>
</tr>
<tr>
<td><strong>Physical Aggression</strong></td>
<td>.071</td>
<td>-.010</td>
</tr>
</tbody>
</table>

Note: *p < .05

Table 2 denotes the differences between respondents who play video games and those who do not, with regards to trait anger, ACE, competitive orientation, hostility, and both verbal and physical aggression. Immediately, it can be noted that the results regarding video games' effects on trait anger, verbal aggression, and physical aggression are statistically insignificant. However, there is statistically significant data for ACE, competitive orientation, and hostility.

To begin, Table 2 indicates a 0.345 point increase in ACE for those who play video games. This means that those who play video games are likely to have experienced slightly more adverse childhood experiences than those who do not play video games. With regards to competitive orientation, there is an apparent 4.219 point increase in competitive orientation score for respondents who play video games over those who do not. This means that if the respondent played video games, they were notably more likely to be competitive than respondents who did not play video games. Last, it can be noted
that those who play video games are likely to have a 2.729 point lower hostility score, indicating that respondents who played video games were less hostile than those who did not.

Table 3. Video Game Play on Means of Trait Anger, ACE, Competitive Orientation, Hostility, and Aggression

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anger</td>
<td>.060</td>
<td>-.044</td>
</tr>
<tr>
<td>ACE</td>
<td>.040</td>
<td>-.029</td>
</tr>
<tr>
<td>Competitive Orientation</td>
<td>-3.401*</td>
<td>-.955*</td>
</tr>
<tr>
<td>Hostility</td>
<td>8.497*</td>
<td>7.337*</td>
</tr>
<tr>
<td>Verbal Aggression</td>
<td>-.046</td>
<td>.034</td>
</tr>
<tr>
<td>Physical Aggression</td>
<td>-.006</td>
<td>.006</td>
</tr>
</tbody>
</table>

Note: *p < .05

In Table 3, the differences between respondents who play violent video games and those who do not play violent video games are illustrated. As with Table 1, the results regarding trait anger, verbal aggression, and physical aggression are statistically insignificant. Additionally though, Table 3 also shows insignificant data for ACE. This means that there is only statistically significant data to be derived from this table concerning competitive orientation and hostility.

This table shows a 2.446 point increase competitive orientation for respondents who play violent video games. From this, one can say if the respondent played violent video games, they were more likely to be competitive than respondents who did not play.
violent video games. Additionally, Table 3 shows a 1.160 point decrease in hostility for those playing violent video games. This indicates that if a respondent reported playing violent video games, they were 1.160 points less hostile than respondents who did not play violent video games.

**Correlations**

As a primary method of analysis, a correlation matrix was created using information gathered through this study. This correlation matrix contains the strength and direction of each bivariate relationship. Correlation coefficients run from -1.0 (a perfect negative correlation) to 1.0 (a perfect positive correlation) with 0.0 (no relationship) in the middle. Importantly, this matrix notes not only the direction and strength of the relationship but also which relationships we are confident are not due to chance (i.e., those statistically significant at a .05 alpha level). Through the careful analysis of these correlations regarding the hypotheses attached to this study, a base understanding of how these variables interconnect and potentially influence each other should emerge. The correlation matrix for this study is as shown in Table 4.
Table 4: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Income</td>
<td>-.157*</td>
<td></td>
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<tr>
<td>3. Sex</td>
<td>.077</td>
<td>.006</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. VVG. More Heavily Reg.</td>
<td>-.030</td>
<td>.040</td>
<td>-.354*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>5. VVG. Cause More Phys. Aggr.</td>
<td>-.046</td>
<td>.042</td>
<td>-.159*</td>
<td>.464*</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. VG Played How Often</td>
<td>.002</td>
<td>-.047</td>
<td>.343*</td>
<td>-.358*</td>
<td>-.271*</td>
<td></td>
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</tr>
<tr>
<td>7. VVG Bring More Hos. Thoughts</td>
<td>-.129*</td>
<td>.072</td>
<td>-.220*</td>
<td>.468*</td>
<td>.759*</td>
<td>-.321*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. “Do you play VG?”</td>
<td>.100</td>
<td>-.061</td>
<td>.238*</td>
<td>-.307*</td>
<td>-.391*</td>
<td>.430*</td>
<td>-.342*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. VVG Lead to Real Life Violence</td>
<td>-.053</td>
<td>.032</td>
<td>-.311*</td>
<td>.735*</td>
<td>.534*</td>
<td>-.319*</td>
<td>-.537*</td>
<td>-.324*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Competitive Orientation</td>
<td>.090</td>
<td>-.046</td>
<td>.179*</td>
<td>-.196*</td>
<td>-.159*</td>
<td>.264*</td>
<td>-.181*</td>
<td>.219*</td>
<td>-.187*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>11. Trait Anger</td>
<td>-.097</td>
<td>.052</td>
<td>-.138*</td>
<td>.111*</td>
<td>.208*</td>
<td>-.062</td>
<td>.289*</td>
<td>-.034</td>
<td>.198*</td>
<td>-.195*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. ACE</td>
<td>.237*</td>
<td>-.165*</td>
<td>-.020</td>
<td>-.050</td>
<td>-.034</td>
<td>.069</td>
<td>-.043</td>
<td>.130*</td>
<td>-.005</td>
<td>.065</td>
<td>.032</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>13. Hostility</td>
<td>-.085</td>
<td>.014</td>
<td>-.155*</td>
<td>.080</td>
<td>.278*</td>
<td>-.211*</td>
<td>.283*</td>
<td>-.216*</td>
<td>.174*</td>
<td>-.250*</td>
<td>.613*</td>
<td>.031</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Verb. Aggr.</td>
<td>-.117*</td>
<td>.017</td>
<td>.049</td>
<td>-.061</td>
<td>.085</td>
<td>.049</td>
<td>.123*</td>
<td>-.028</td>
<td>-.070</td>
<td>-.118*</td>
<td>.498*</td>
<td>.000</td>
<td>.525*</td>
<td></td>
</tr>
<tr>
<td>15. Phys. Aggr.</td>
<td>-.117*</td>
<td>-.012</td>
<td>-.003</td>
<td>.035</td>
<td>.238*</td>
<td>-.053</td>
<td>.188*</td>
<td>-.031</td>
<td>.087</td>
<td>-.110*</td>
<td>.500*</td>
<td>.048</td>
<td>.515*</td>
<td>.579*</td>
</tr>
</tbody>
</table>

*Note: *p < .05
Hypothesis Testing

Hypothesis 1

Initially, this study hypothesized that the more ACE a person has undergone, the more likely they are to be hostile. As this study dictates that hostility must be a necessary predecessor to verbal aggression and physical aggression, the correlations between ACEs and hostility, the verbal aggression index, the physical aggression index as well as two self-reported questions concerning the extent to which violent video games caused more hostile thoughts and caused the respondent to become more aggressive should be examined. Thus, one would expect those relationships between ACE and those variables to be positive. Looking at the bivariate relationships between ACE and hostility, verbal aggression, physical aggression, and the two self-report variables, one sees that this first hypothesis is not supported by the bivariate relationships. None of the correlations are statistically significant.

Hypothesis 2

The second hypothesis proposed by this study is that the more trait anger a person exhibits, the more likely they are to be hostile. By investigating the correlations between trait anger and hostility, verbal aggression, physical aggression, and the two self-report categories that indicate the extent to which violent video games cause more hostile thoughts in the respondent and the extent to which violent video games lead the respondent to become physically aggressive, one can see just how trait anger affects the respondent in this study.

Here, we do see support for this hypothesis. Trait anger and hostility are positively correlated ($r=.613$). This relationship is statistically significant at the .05 level.
and indicates a moderately strong positive relationship. As for trait anger and the two forms of aggression, trait anger is again positively correlated with verbal aggression ($r=.498$) and physical aggression ($r=.500$). These are both statistically significant as well and indicate moderate positive relationships. From this, it can be determined that as trait anger increases, hostility, verbal aggression, and physical aggression are all expected to increase as well, though hostility itself is expected to increase at a bit faster of a rate than the two forms of aggression.

Regarding the two self-reported categories, trait anger is correlated with self-reported physical aggression at .208 and self-reported hostility at .289. These are both statistically significant at the .05 level and indicate weak-to-moderate positive relationships. While these are weaker relationships than the previously investigated correlations, these still indicate a positive relationship between trait anger and hostility and aggression.

### Hypothesis 3

The third hypothesis is that increased competitiveness may also increase hostility. Support for this hypothesis can be assessed by examining the correlations between competitiveness and the measures of hostility and aggression. Competitive orientation is correlated with hostility ($r=-.250$). This relationship is statistically significant at the .05 level and indicates a fairly weak negative relationship. In the bivariate case, as competitiveness increases, hostility decreases. As for verbal and physical aggression, competitive orientation is correlated with these two variables ($r=-.118$ and $r=-.110$, respectively). These are also statistically significant and indicate weak negative relationships. While these relationships are all weak, they do seem to disagree with the
previous assertion that the more competitive a person is, the more hostile and aggressive they will be.

As for the self-report categories, the correlation between competitive orientation and self-reported physical aggression is -.159. Similarly, the correlation between competitive orientation and self-reported hostility is -.181. Both relationships are statistically significant and indicate weak negative relationships, much like the previous correlations investigated. From all of this, one can take away that hypothesis 3 is not supported. Instead, there is consistent evidence, at least among the bivariate measures of a weak negative relationship between competitiveness and hostility and aggression.

**Hypothesis 4**

While the primary focus of this study was the effects on hostility that may stem from the variables of trait anger, adverse childhood experiences, and competitiveness, another consideration was the relation between hostility and verbal and physical aggression. Based on the literature, it is hypothesized that as hostility increases, aggression also increases. Looking at Table 4, one sees that hostility is positively correlated with both verbal aggression (r=.525) and physical aggression (r=.515). Both correlations are statistically significant at the .05 level and indicate a moderate positive relationship. Ergo, hypothesis 4 is supported by the correlation matrix. Similarly, verbal aggression is correlated with physical aggression at .579. This is also statistically significant and indicates a moderate positive relationship. By these correlations, hostility does clearly have some positive influence on verbal and physical aggression. It is also readily apparent that verbal aggression does positively affect physical aggression. In
other words, as hostility increases, aggression increases, and as verbal aggression specifically increases, physical aggression is also expected to increase.

**Path Analysis**

To further examine my hypotheses, I performed a path analysis. Path analysis uses multiple regression to provide explanations of possible causal relationships among a set of variables. The reason a path analysis is beneficial is because it is a means to clearly illustrate the statistically-significant intervariable relationships present in the study. It also allows for the strongest and weakest relationships to be easily ascertained and isolated for further analysis, both in general and relative to the study’s hypotheses. To perform the path analysis, a diagram of theoretical relationships among the variables of interest in this study was constructed. This diagram detailed relationships among all relevant variables and was ordered based on time, establishing a causal ordering of variables.

My diagram is presented in Figure 2 (p. 35). Once these projected relationships were determined, multivariate regression was performed, examining beta coefficients were calculated for each exogenous variable on the endogenous variable (The underlying regression analyses are presented in Appendix II). By making these calculations and displaying them coherently within the diagram, a general picture of the strength of direct and indirection causal relationships is developed and hypotheses can be assessed. The completed diagram of the path analysis, displaying all statistically significant direct, indirect, and total causal effects is shown in Figure 2, while the strength and directionality of relationships appears in Table 5.
Table 5. Closer Look at Path Analysis, Ordered by Strongest to Weakest Beta Strength

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Beta (Absolute Value)</th>
<th>Beta (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostility – Verb. Aggr.</td>
<td>.394</td>
<td>.394</td>
</tr>
<tr>
<td>Trait Anger – Hostility</td>
<td>.371</td>
<td>.371</td>
</tr>
<tr>
<td>Trait Anger – Verb. Aggr.</td>
<td>.291</td>
<td>.291</td>
</tr>
<tr>
<td>VVG Bring More Hos. Thoughts – Trait Anger</td>
<td>.273</td>
<td>.273</td>
</tr>
<tr>
<td>VG Lead to Real Life Violence – Verb. Aggr.</td>
<td>.230</td>
<td>-.230</td>
</tr>
<tr>
<td>Age – ACE</td>
<td>.221</td>
<td>.221</td>
</tr>
<tr>
<td>Trait Anger – Phys. Aggr.</td>
<td>.188</td>
<td>.188</td>
</tr>
<tr>
<td>Hostility – Phys. Aggr.</td>
<td>.164</td>
<td>.164</td>
</tr>
<tr>
<td>VVG Played How Often – Comp. Orientation</td>
<td>.160</td>
<td>.160</td>
</tr>
<tr>
<td>VVG Cause More Phys. Aggr. – Hostility</td>
<td>.152</td>
<td>.152</td>
</tr>
<tr>
<td>VVG More Heavily Reg. – Hostility</td>
<td>.139</td>
<td>-.139</td>
</tr>
<tr>
<td>VVG Bring More Hos. Thoughts – Phys. Aggr.</td>
<td>.129</td>
<td>-.129</td>
</tr>
<tr>
<td>Income – ACE</td>
<td>.120</td>
<td>-.120</td>
</tr>
<tr>
<td>VG Played How Often – Hostility</td>
<td>.117</td>
<td>-.117</td>
</tr>
<tr>
<td>“Do you play VG?” – Hostility</td>
<td>.115</td>
<td>-.115</td>
</tr>
<tr>
<td>Sex – Verb. Aggr.</td>
<td>.099</td>
<td>.099</td>
</tr>
<tr>
<td>“Do you play VG?” – Phys. Aggr.</td>
<td>.096</td>
<td>.096</td>
</tr>
<tr>
<td>Comp. Orientation – Hostility</td>
<td>.086</td>
<td>-.086</td>
</tr>
</tbody>
</table>
General Findings

The path analysis included 20 total linear relationships among the many variables utilized. These relationships were chosen based on which variables were statistically significant in each regression comprising the path analysis. In turn, the beta coefficients included in Figure 2 and Table 5 come from these regressions as well.

To best outline which relationships stand out, it may prove beneficial to single out the three strongest and the three weakest included in this path analysis. As for the three strongest, the first of these is the relationship between verbal aggression and physical aggression, which has a beta of .398, the largest in this analysis. Second is the relationship between hostility and verbal aggression, with a beta of .394. The third strongest is then the relationship between trait anger and hostility, with a beta of .371. The importance of this will be discussed in a later section, though it is interesting just how much stronger these three relationships are in comparison to the others. While these three relationships all boast beta values of .371 or greater, the next strongest relationship, the relationship between trait anger and verbal aggression, is substantially lower, at .291. While this would still not be all that weak in this study, it shows the extent to which the three strongest relationships are set apart from the others, regarding beta values.

As for the weakest significant relationships, the absolute weakest is the relationship between competitive orientation and hostility, as this relationship has a beta value of only .086. Slightly stronger is the relationship between whether or not the respondent plays video games and physical aggression, with a beta value of .096. A bit stronger than that is the relationship between sex and verbal aggression, with a beta value of .099. Again, the importance of these beta values will be addressed in a later section.
However, by indicating which relationships stand out, for better or for worse, an early understanding of the statistically-significant inter-variable relationships for this study can be ascertained.

**Findings Relating to the Hypotheses**

While this information allows for a basic introductory understanding of the path analysis conducted for this study, it may be more pertinent to emphasize and prioritize an analysis of which paths shed light on the questions posited most directly by this study.

**Hypothesis 1.** Hypothesis 1 suggested a positive relationship between ACEs and hostility and aggression. This was examined using the bivariate correlation table, and no support was found for this hypothesis. Looking at the significant pathways in Figure 2, there seem to be no pathways between ACEs and any of the dependent variables of interest in the study. Both a respondent’s age and income affect their likelihood of experiencing ACEs, but none of these variables appear to cause hostility or aggression.

**Hypothesis 2.** The second hypothesis proposed a positive relationships between trait anger and hostility. The more trait anger one has, the more hostility and aggression they will report. This hypothesis was preliminarily supported by the correlation matrix. From the path analysis, we see continued support of this hypothesis. Controlling for other variables in the model, trait anger has a direct positive effect on hostility as well as both direct positive effects on verbal and physical aggression. In addition, one can see the positive indirect effects of trait anger on verbal and physical aggression as mediated by hostility.

Notably, the relationship between hostility and trait anger is one of the strongest found by this study, having an absolute beta value of .371. This is one of only three
relationships that has an absolute beta value above .300, with the other two being the relationship between hostility and verbal aggression and the relationship between verbal aggression and physical aggression, at .398 and .394 respectively. As for the relationship between trait anger and respondent-indicated extent to which violent video games increase respondent hostility, this relationship’s absolute beta value of .273 is still relatively strong, relative to the path analysis as a whole. While this is respondent-indicated and not directly related to the main dependent variables, this still suggests the respondents’ susceptibility to becoming hostile relative to their individual levels of trait anger. At a glance, seeing that of all of the primary independent variables present in this study is easy—trait anger has the strongest relationships to the relevant dependent variables. Thus, the path analysis adds support to the hypothesized relationship between trait anger and hostility and aggression.

Hypothesis 3. The third hypothesis in this study was that competitive orientation has a positive relationship with hostility and aggression. The bivariate correlations suggested that the exact opposite relationship (that competition decreased hostility and aggression) held and suggested that the hypothesis be rejected. Controlling for relevant variables in the models, the path analysis refines our understanding of these relationships. Competitive orientation is revealed to have a direct, negative relationship with hostility. However, competitiveness only has indirect negative effects on verbal and physical aggression. Hostility mediates the relationship between competitiveness and aggression. Thus, the hypothesis as currently stated continues to be unsupported by the data. Competitive orientation does not increase, but instead decreases hostility and thereby also decreases verbal and physical aggression.
Hypothesis 4. The fourth and final hypothesis proposed by this study was a positive relationship between hostility and aggression. Factor analysis dictated that the original variable of “aggression” be separated into two unique variables, verbal aggression and physical aggression. So, three separate relationships should be considered: the direct relationship between hostility and verbal aggression, the direct relationship between hostility and physical aggression, and the indirect relationship between hostility and physical aggression as mediated by verbal aggression.

To rephrase, it was proposed that the more a respondent exhibited hostility, the more that respondent would exhibit verbal and physical aggressiveness. This hypothesis was supported in the bivariate data. Controlling for the other exogenous variables in the path model, these relationships weaken (as compared with their correlation coefficients in Table 4) but still hold. Still, the direct relationships among these variables are some of the strongest in the path model.

This indicates that as a respondent is more hostile, they are more likely to become verbally aggressive, and as they become more verbally aggressive, they are more likely to become physically aggressive. However, while higher hostility does seem to influence a higher likelihood of physical aggression, it is notably less likely for hostility to lead into physical aggression than it is for hostility to simply move into and remain at verbal aggression. Overall though, the connection between hostility and aggression itself is the most definitive relationship that can be ascertained from this path analysis. Thus, hypothesis 4 is supported by the findings.
Video Game Play and Violence in Video Games

As addressed in the methods, a set of t-tests were calculated as an additional form of analysis. These t-tests pertained to the effects of video game play, specifically whether or not the respondent played video games, and to the effects of violence in video games, both with regards to the variables of trait anger, ACE, competitive orientation, hostility, verbal aggression, and physical aggression. While not all of the data turned up significant, there was some significant data that is worthy of a closer inspection.

With regards to competitive orientation, there was a bit of significant data indicating how the respondents’ competitiveness changed based on whether or not they played video games. As seen in Table 1, there is a nearly 4 point incline in competitiveness in the respondents who indicate that they do play video games. This means that the respondents who played video games were more likely to be competitive than those who did not. Additionally, there was significant data regarding competitiveness and violence in video games. Taken from Table 2, if the respondent is playing violent video games rather than nonviolent video games, they are expected to score nearly 2.5 points higher on their competitive orientation score. This indicates that if the respondent is exposed to violence in their video games, they are more likely to be competitive than those who do not play violent video games.

There is a bit more information regarding ACE that can be ascertained from this data as well, but only with regards to whether or not the respondent plays video games. From Table 1, there is an observed increase in ACE scores of approximately .35 points for respondents who play video games. What this seems to indicate is that respondents who play video games are slightly more likely to have faced adverse childhood
experiences than those who do not play video games. As an aside, in the case of violence in video games, data regarding ACE turned up insignificant.

Last, data from these t-tests can be used to shed a bit of light on the effects of video game play and violence in video games on hostility directly. Based on data from Table 1, there is a nearly 2.7 point decrease in hostility in respondents who indicate that they play video games. This indicates that if a respondent plays video games, they are notably less likely to be hostile than respondents who do not play video games. As for violence, it can be observed in Table 2 that those who play violent video games score around 1.2 points lower on their hostility scores. This means that respondents who play video games that feature violence are less likely to be hostile than those who play video games that do not feature violence.
CHAPTER V
DISCUSSION

From the correlation analysis and the path analysis conducted for this survey, a great deal can be learned. As a whole, this study aimed to shed light on the degree to which adverse childhood experiences, trait anger, and competitive orientation affected hostility, as well what extent this hostility may transition into aggression. More specifically, four hypotheses were presented: First, it was proposed that the more adverse childhood experiences reported by a respondent, the higher that respondent’s hostility would be. Second, this study asserted that as a respondent exhibited more trait anger, they would in turn exhibit more hostility. Third, this study suggested that if a respondent indicated a higher competitive orientation, they would also indicate higher levels of hostility. And fourth, it was assumed that the more hostile a respondent is, the more aggressive the respondent will be.

Findings

Concerning ACEs, the hypothesis was not supported by neither the bivariate correlation matrix nor the multivariate path model. ACE does not measurably affect hostility or aggression. However, both bivariate and multivariate findings support the hypothesis concerning trait anger and its positive relationship with hostility. Trait anger and hostility are correlated at $r=0.613$. This statistically-significant, moderately-strong relationship indicates that as trait anger increases, hostility is also expected to increase substantially. Noting that trait anger also has a moderate positive relationship with verbal
aggression and with physical aggression, having correlation scores of .498 and .500 respectively, is also important. This shows that besides having a positive relationship with hostility, trait anger also seems to have a positive relationship with both forms of aggression. As for the path analysis, the strongest predictor of hostility is the trait anger. At .371, this is one of the strongest relationships in the path analysis. This means that beyond the correlation analysis supporting the hypothesis, trait anger has the most profound impact on hostility out of the three primary independent variables: ACE, competitive orientation, and trait anger.

The hypothesized relationship between competitive orientation and hostility and aggression was the obverse of the findings. The correlations indicate a somewhat weak negative relationships. Instead, this shows that as the respondent’s competitive orientation score increased, his or her hostility score is actually expected to decrease. While the correlation is not too strong, this does negate what the hypothesis originally proposed. Combining this with the path analysis, it can be said that if competitive orientation affects hostility, it causes hostility to decrease to some lesser extent, rather than raise notably.

Lastly, hostility and aggression are very strongly correlated. Hostility is correlated with verbal aggression at .525 and physical aggression at .515. This strong positive relationship shows that as a respondent becomes more hostile, they are expected to become more aggressive in turn. With an absolute beta value of .394 for the relationship between hostility and verbal aggression, and .398 for the relationship between verbal aggression and physical aggression, the path analysis seems to reaffirm this assertion. With these being the strongest paths in the analysis, one can argue that the relationship
between hostility and aggression is very strong, which aligns with the relevant hypothesis.

**Connections to Literature**

From the literature, adverse childhood experiences appear to have some notable and sometimes severe effects on an individual’s deviance or violent tendencies. That having been said, any information regarding hostile or aggressive feelings and behavior measured by this study, specifically regarding ACE, turned up statistically insignificant. As such, this study seems to disagree with what the previous literature stated. Even so, this study focused more specifically on hostile feelings and aggressive actions, and criminality or deviance do not necessarily require hostility or aggression. As a result, all that can be said with any confidence is that ACE does not appear to have any influence on hostility or aggression as defined by this study and as reported by members of this study’s sample. Given that the vast majority respondents for this study reported having very little to no adverse childhood experiences, which is likely very different from the larger population, it can be asserted that the information gathered on ACE in this study is not truly generalizable to said larger population. This may be why the findings made by this study disconnect so dramatically from what the literature suggests.

As for the literature on trait anger, researchers indicated a strong relationship between how much trait anger an individual exhibited and that individual’s tendency to become hostile and/or aggressive. Given that trait anger was shown to have a fairly strong influence over hostility in the aforementioned data, this study seems to agree with what previous literature asserted. While questions in this study were aimed more at video
game players than the larger population, one may argue that these results still corroborate what the previous research stated. In this study, trait anger was shown not only to influence hostile thoughts substantially, but it also was shown to influence verbal aggression about as substantially, while still showing some effect over physical aggression to a lesser but still noteworthy extent.

The literature focused on the connection between competitiveness and hostility went back and forth, with some researchers indicating that being competitive may increase an individual’s tendency to become hostile, while others asserted that competitiveness may be therapeutic or cathartic, and thus lowering the individual’s levels of hostility. All of that having been said, this study indicated a weak negative relationship between competitiveness and hostility. While this does lend support to the literature that argued competition was therapeutic, this study only indicates a small influence.

**Limitations**

First, the primary limitation of this study is the sample size. As with any study, the researcher is limited by his or her own resources. In this study, the maximum feasible sample was ruled to be 377 students. Similarly, this study is limited by the population, as the findings made by this study are only truly potentially generalizable to the population of young adult, college-enrolled students. For this study, this leaves out anyone under the age of 18 and younger than the age of 35. This also leaves out anybody, young adult or otherwise, who is not enrolled in college. In fact, as this sample only involved students at Western Kentucky University, one might assert that these findings only truly generalize to young adults at this university, though an opposing argument may be made that
students at this university are not different enough from students at other universities to warrant such a narrow scope of generalizability.

With regards to generalizability, in Table 1, the final sample for this study was compared to the reported demographic makeup of WKU in the Factbook. From the data available, comparisons were possible to make between this study’s sample and the Factbook-reported WKU population with regards to sex, race, and age. For sex, this study showed 47.7% male participation, while the Factbook indicates that at the time data was collected, the student body was comprised of 41.1% males. This in itself does not appear to be too great of a difference, though it can be noted that the student body was comprised of a slightly-greater quantity of females than this study showed.

With age, the WKU Factbook does not get too specific, opting to combine ages into groups like “Teens,” “Twenties,” and so on. As such, all that could be ascertained is that the greatest quantity of students fell into the “Twenties” distinction in the Factbook, while the median age for this study was 21. Though these align, there is not much that can be said given how the Factbook delineated age.

As for race, this study had 88.4% white participation, while the student body at the time was comprised of only 77.0% white students. This is a bit more notable than the difference in sex, though still only an 11.4% difference. It may be argued however that there were not enough minorities included in this study’s sample to consider the results truly generalizable, though ultimately, the makeup of this study’s respondents was still fairly similar to the student body as a whole with regards to race.

One more-specific limitation faced by this study is the skewness of the ACE variable. When looking at the frequencies for ACE scores in this study, it was
immediately apparent that there was a heavy positive skew on the data. This means that a relatively high percentage of people included in this study faced little to no adverse childhood experiences, while very few experienced ACE to any noteworthy degree. Given that this is likely well below the general population, it can be asserted that the information gathered on ACE in this study is not truly generalizable to the larger population.

Beyond these limitations, noting that the data collected by this study is self-reported is important. As a survey was used for this study, the information necessary for analysis could not be directly observed. Given this, it is entirely possible that some respondents were intentionally or unintentionally dishonest in their responses. This study must necessarily assume that all respondents were honest, if not just to the best of their abilities, though there is no way to determine this for sure.

Lastly, noting the limitation of time is important. Given that this study was completed as part of a degree, conducting a larger study, and possibly using other measures besides the survey collected, was not feasible. This was also not possible due to the limitation of financial resources that may have allowed for more possibilities when it comes to gathering data. Were boundless time and money granted to this study, many aspects could have been expanded upon, changes, or possibly even redone. That having been said, this study operated to the best of its ability given its allotted resources.

**Conclusion**

The strongest relationship observed in this study is that between trait anger and hostility. Based on this, in future studies on this topic, trait anger may evidently be a
crucial factor to take into consideration. Trait anger was shown in this study to be a heavy influence on the respondent’s hostility level. Ergo, if future studies aim to investigate causes of or influences on hostility in young adults, trait anger should be a key focal point.

Conversely, adverse childhood experiences were shown to have no effect at all on hostility. While previous literature has indicated that ACE has the potential to raise a person’s likelihood of deviance and criminal behavior, this study indicated nothing of the sort. What can be rightfully assumed by this fact is that ACE may not be beneficial for future studies as a potential influence on hostility or aggression. While it is possible that ACE could be observed to have a substantial relationship with hostility given a different population or subject matter, it should evidently not be considered for future research utilizing a similar sampling base, as the college students who responded to this study did not experience ACE as frequently as may be expected for the larger population.

Similarly, competitive orientation did not indicate too strong of a relationship with hostility either. While there was a statistically-significant relationship observed in the correlations and the path analysis, it was fairly weak. Because of this, one might argue that competitive orientation should not be a focus for future studies on hostility in young adult video game players, or possible even studies on hostility overall.

Overall, this study shows that trait anger is a driving force behind hostility in young adults, particularly those who play video games. That being said, adverse childhood experiences and competition showed either a weak relationship or no relationship to hostility and aggression. This means that the only substantial influence on hostility, in relation to the three primary independent variables of ACE, competitive
orientation, and trait anger, was trait anger, while the other two had no meaningful effect. Ergo, young adult video game players with higher levels of trait anger are more prone to becoming hostile, while adverse childhood experiences and competitive orientation have little to no impact on the individual’s hostility.
REFERENCES


APPENDIX A
SURVEY INSTRUMENT

For this section, please give some general information about yourself.

1) How often do you use the following per day?

<table>
<thead>
<tr>
<th></th>
<th>Less than 1 hour</th>
<th>1 – 3 hours</th>
<th>4 – 6 hours</th>
<th>7 – 9 hours</th>
<th>10 – 12 hours</th>
<th>More than 12 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
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<tr>
<td>Television</td>
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<td>Video streaming</td>
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<td>services (e.g. Netflix, Hulu, etc.)</td>
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<tr>
<td>Video games</td>
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</tbody>
</table>

2) Do you play video games?
   Yes [go to next question]
   No [skip to Question #75]

3) What video games do you play most often? (List 3 in order of most played)
   1.
   2.
   3.

4) What genre of game do you most often play? [If mouse-over is an option, include examples]
   • First Person Shooter
   • Role-Playing Game (RPG)
   • Massive Multiplayer Online RPG (MMORPG)
   • Strategy / Puzzle
• Sports
• Racing
Platformer (e.g., Mario, Castlevania, Bionic Commando)
g. Casual games (e.g., Bejeweled, Mafia Wars, Farmtown)
h. Music/Rhythm (e.g., Guitar Hero, Rock Band, Dance Dance Revolution)
• Other: ______________

5) What is the ESRB rating of the game you have played the most this week?
• E (Everyone)
• T (Teen)
• M (Mature)
• AO (Adults Only)
• Other (please specify)
• Unsure

6) On which of these systems do you commonly play? (Check all that apply)
• Nintendo Wii
• Nintendo Wii U
• Xbox 360
• Xbox One
• PS3
• PS4
• Personal computer
• Handheld console (Nintendo DS, Nintendo 3DS, PSP, PS Vita, etc.)
• Other (please specify)

<table>
<thead>
<tr>
<th>I am generally more argumentative while playing video games.</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I often have a hot temper while playing video games.</td>
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<tr>
<td>I feel less aggressive after playing video games.</td>
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<tr>
<td>Playing video games increases the likelihood of me hitting someone else.</td>
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<td>Playing video games is effective in relieving my stress.</td>
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<tr>
<td>Video games make me feel more anxious or agitated.</td>
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<tr>
<td>Playing video games is something I do to calm myself down.</td>
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<tr>
<td>I often feel sad after playing particularly violent games.</td>
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<tr>
<td>The video games I play most often contain blood and gore.</td>
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<tr>
<td>My favorite video games involve my shooting or otherwise physically harming my opponents.</td>
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<tr>
<td>I only play video games that are nonviolent.</td>
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</tbody>
</table>
My favorite video games rank players based on how many people their characters have killed.

I often play video games that have my characters assassinate or physically harm specific, named enemies.

The enemies in my favorite video game are intended to be human in likeness.

I often recognize human emotion in the enemies of my favorite video game.

I have never felt sympathy for another character in a video game.

Video games are best when I win.

The video games I play often involve direct competition with at least one other human player in the same room.

The video games I play often involve direct competition with at least one other human player online or otherwise not in the same room.

My favorite video game ranks players or teams based on 1st place, 2nd place, etc.

I hate to lose in a video game against another person.

Violent video games lead to real life violence

Violent video games should be more heavily regulated

Violent video games often make me have more violent or hostile thoughts

Violent video games often cause me to be more physically aggressive

In the past 3 months, have you

<p>| Stayed near another character’s corpse to immediately kill them again when they come back to life. | No | Yes, just once | Yes, more than once |
| Had someone stay near your character’s corpse to kill you when you came back to life. | | |
| Followed someone around insulting them | | |</p>
<table>
<thead>
<tr>
<th>Had someone follow you around shouting insults and slurs at you</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever quit a game because of your opponents’ behavior</td>
<td></td>
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</tr>
<tr>
<td>Have you ever had other players quit a game because of your behavior</td>
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<td></td>
</tr>
<tr>
<td>Have you ever been kicked off a game for your in-game behavior?</td>
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<tr>
<td>Have you intentionally idled your character to annoy other players?</td>
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<tr>
<td>Have you ever been subjected to in-game sprays or tags by other players that you considered offensive?</td>
<td></td>
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<tr>
<td>Have you ever used a spray or tag in-game with the intention of causing offense.</td>
<td></td>
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</tr>
<tr>
<td>Intentionally spammed in-game communications repeatedly with frivolous messages, sound clips, or music.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had someone intentionally spam in-game communications with messages, sound clips, or music.</td>
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<td></td>
</tr>
<tr>
<td>Intentionally killed another player on the your own team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intentionally been killed by another player on your own team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intentionally entered another character’s private space (e.g. spawn points, etc.) against their wishes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had someone intentionally enter your in-game private space (e.g., spawn points, etc.) against your wishes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulled or led a hostile NPC or creature along behind you and attempting to get it</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
to attack another player who did not want to fight it.

| Had someone lead a hostile NPC or creature that you did not want to fight. |
| Resurrected another character just to kill them again. |
| Had another player resurrect your character just to kill your character again. |
| Taken loot that was earned by another player by speed, guile, or a cheat. |
| Had another player take your loot by speed, guile or a cheat. |
| Stolen a kill from another player |
| Had a kill stolen by another player |
| Danced or squatted on another player character’s corpse as a victory celebration. |
| Had another player dance or squat on your character’s corpse as a victory celebration. |

Competitive Orientation

The questions below ask about your goals in competitive games. For each question, circle the number that indicates how satisfied you would be in that situation on the 0 to 10 scale with 0 indicating very dissatisfied and 10 indicating very satisfied in that situation.

**You play well and win**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Dissatisfied</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Very Satisfied</td>
</tr>
</tbody>
</table>

**You play poorly and lose**
Very Dissatisfied  Satisfied

You play well and lose

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very</td>
<td>Very</td>
<td>Dissatisfied</td>
<td>Satisfied</td>
<td></td>
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</tbody>
</table>

You play poorly and win

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very</td>
<td>Very</td>
<td>Dissatisfied</td>
<td>Satisfied</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hostility

*Note: Questions 7 through 37 are taken directly or paraphrased from the Stress and Eros Hostility Questionnaire (Roeder, 2011).*

For questions 7 through 37, choose if response A or response B better fits how you would respond to each situation. Choose only one response for each question, and if neither response fully applies to you, choose the one that fits the best.

7) A teenager drives by my yard with the car stereo blaring acid rock.
   A. I begin to understand why teenagers can't hear.
   B. I can feel my blood pressure starting to rise.

8) The person who cuts my hair trims off more than I wanted.
   A. I tell him or her what a lousy job he or she did.
   B. I figure it'll grow back, and I resolve to give my instructions more forcefully next time.

9) There have been times when I was very angry with someone.
   A. I was always able to stop short of hitting them.
   B. I have, on occasion, hit or shoved them.

10) The newspaper contains a prominent news story about drug-related crime.
    A. I wish the government had better educational/drug programs, even for pushers.
    B. I wish we could put every drug pusher away for good.
11) I sometimes argue with a friend or relative.
   A. I find profanity an effective tool.
   B. I hardly ever use profanity.

12) I am stuck in a traffic jam.
   A. I usually am not particularly upset.
   B. I quickly start to feel irritated and annoyed.

13) Sometimes I keep my angry feelings to myself.
   A. Doing so can often prevent me from making a mountain out of a molehill.
   B. Doing so is usually a bad idea.

14) Another driver butts ahead of me in traffic.
   A. I usually flash my lights or honk my horn.
   B. I stay farther back behind such a driver.

15) Someone treats me unfairly.
   A. I usually forget it rather quickly.
   B. I am apt to keep thinking about it for hours.

16) Someone expresses an ignorant belief.
   A. I try to correct him or her.
   B. I am likely to let it pass.

17) I am caught in a slow-moving bank or supermarket line.
   A. I usually start to fume at people who dawdle ahead of me.
   B. I seldom notice the wait.

18) Someone is being rude or annoying.
   A. I am apt to avoid him or her in the future.
   B. I might have to get rough with him or her.

19) An elevator stops too long on a floor above where I am waiting
   A. I soon start to feel irritated and annoyed.
   B. I start planning the rest of my day.

20) I am around someone I don't like.
   A. I try to end the encounter as soon as possible.
   B. I find it hard not to be rude to him or her.

21) Someone criticizes something I have done.
   A. I feel annoyed.
   B. I try to decide whether the criticism is justified.

22) I am involved in an argument.
   A. I concentrate hard so that I can get my point across.
   B. I can feel my heart pounding, and I breathe harder.
23) A friend or co-worker disagrees with me.
   A. I try to explain my position more clearly.
   B. I am apt to get into an argument with him or her.

24) Someone is speaking very slowly during a conversation.
   A. I am apt to finish his or her sentences.
   B. I am apt to listen until he or she finishes.

25) I have strong beliefs about rearing children.
   A. I try to reward mine when they behave well.
   B. I make sure that they know what the rules are.

26) I hear news of another terrorist attack.
   A. I feel like lashing out.
   B. I wonder how people can be so cruel.

27) There have been times in the past when I was really angry.
   A. I have never thrown things or slammed a door.
   B. At times I have thrown something or slammed a door.

28) Life is full of little annoyances.
   A. They often seem to get under my skin.
   B. They seem to roll off my back unnoticed.

29) I disapprove of something a friend has done.
   A. I usually keep such disapproval to myself.
   B. I usually let him or her know about it.

30) I feel a certain way nearly every day of the week.
   A. I feel grouchy some of the time.
   B. I usually stay on an even keel.

31) Someone bumps into me in a store.
   A. I pass it off as an accident.
   B. I feel irritated at the person's clumsiness.

32) A boyfriend or girlfriend calls at the last minute to say that he or she is "too tired to go out tonight," and I am stuck with a pair of fifteen-dollar tickets.
   A. I try to find someone else to go with.
   B. I tell my friend how inconsiderate he or she is.

33) I recall something that angered me previously.
   A. I feel angry all over again.
   B. The memory doesn't bother me nearly as much as the actual event did.

34) Someone is hogging the conversation at a party.
   A. I look for an opportunity to put him or her down.
   B. I soon move to another group.
35) At times, I have to work with incompetent people.
   A. I concentrate on my part of the job.
   B. Having to put up with them ticks me off.

36) I hold a poor opinion of someone.
   A. I keep it to myself.
   B. I let him or her know about it.

37) In most arguments I have, the roles are consistent.
   A. I am the angrier one.
   B. The other person is angrier than I am.

**Aggression**

*Note: Questions 38 through 51 are taken directly or paraphrased from the Buss Perry Aggression Questionnaire (Buss & Perry, 1992).*

For questions 38 through 51, indicate how uncharacteristic or characteristic each of the following statements is in describing you.

[Reader Note: In the survey that will be sent out to respondents, these will follow a Likert scale with the following categories in this order: extremely uncharacteristic, somewhat uncharacteristic, neither uncharacteristic nor characteristic, somewhat characteristic, extremely characteristic. For readability’s sake in this proposal, I will simply include the prompts, though each of the prompts in this “Aggression” section will all follow and be presented with this scale.]

   38) Some of my friends think I have a short fuse.
   39) If I have to resort to violence to protect my rights, I will.
   40) I tell my friends openly when I disagree with them.
   41) I have become so mad that I have broken things.
   42) I can’t help getting into arguments when people disagree with me.
   43) Once in a while, I can’t control the urge to strike another person.
   44) I am usually not an even-tempered person.
   45) I have threatened people I know.
   46) Given enough provocation, I may hit another person.
   47) When people annoy me, I tell them what I think of them.
   48) When frustrated, I let my irritation show.
   49) My friends say that I’m somewhat argumentative.
   50) Sometimes I fly off the handle for no good reason.
51) I feel like I get into fights a little more than the average person.

**Trait Anger**

*Note: Questions 52 through 64 are taken directly or paraphrased from the Denson et al. Displaced Aggression Questionnaire* (Denson et al., 2006).

For questions 52 through 64, indicate how uncharacteristic or characteristic each of the following statements is in describing you.

[Reader Note: In the survey that will be sent out to respondents, these will follow a Likert scale with the following categories in this order: extremely uncharacteristic, somewhat uncharacteristic, neither uncharacteristic nor characteristic, somewhat characteristic, extremely characteristic. For readability’s sake in this proposal, I will simply include the prompts, though each of the prompts in this “Trait Anger” section will all follow and be presented with this scale.]

52) I keep thinking about events that angered me for a long time.

53) I get worked up just thinking about things that have upset me in the past.

54) I often find myself thinking over and over about things that have made me angry.

55) Sometimes, I can’t help thinking about times when someone made me mad.

56) Whenever I experience anger, I keep thinking about it for a while.

57) After an argument is over, I keep fighting with this person in my imagination.

58) When someone makes me angry, I can’t stop thinking about how to get back at this person.

59) I think about certain events from a long time ago and they still make me angry.

60) If someone harms me, I am not at peace until I retaliate.

61) I often daydream about situations in which I am getting revenge against those who have wronged me.

62) I think about ways of getting back at people who have made me angry long after the event has happened.

63) When somebody offends me, sooner or later I retaliate.

64) I never help those who do me wrong.

**Adverse Childhood Experiences**
Note: Questions 65 through 74 are taken directly or paraphrased from the Adverse Childhood Experience Questionnaire (National Council of Juvenile and Family Court Judges, 2006).

For questions 65 through 74, answer “yes” for each of these that are true for your first 18 years of life, and “no” for any that are not:

65) Did a parent or other adult in the household often insult you, put you down, or act in a way that made you afraid that they might physically harm you?
   • Yes
   • No

66) Did a parent or other adult in the household often push, grab, slap, or throw things at you?
   • Yes
   • No

67) Did an adult or person at least 5 years older than you ever touch you in a sexual way or have you touch them in a sexual way?
   • Yes
   • No

68) Did you often feel that you did not have enough to eat, had to wear dirty close, or had no one to protect you?
   • Yes
   • No

69) Were your parents or guardians often too drunk or high to take care of you or take you to a doctor if necessary?
   • Yes
   • No

70) Were your parents ever separated or divorced?
   • Yes
   • No

71) Was your mother or stepmother often pushed, grabbed, slapped, had something thrown at her, kick, punched, or threatened with a weapon?
   • Yes
   • No

72) Did you live with anyone who was a problem drinker, alcoholic, or who used street drugs?
   • Yes
   • No

73) Did a household member ever attempt suicide?
   • Yes
   • No

74) Did a household member go to prison before you were 18 years of age?
   • Yes
   • No
Demographics

75) What is your sex?
   • Male
   • Female

76) What is your current age?
   • Younger than 18 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25 • 26 • 27 • 28 • 29 • 30 • 31 • 32 • 33 • 34 • 35+

77) What is your current GPA?
   [Box for entry]

78) Which of the following races/ethnicities best describes you?
   • White
   • African American
   • Hispanic
   • Asian / Pacific Islander
   • American Indian
   • Other

79) What is your current level of education in college? (This is the level you are currently in and have yet to complete.)
   • Freshman
   • Sophomore
   • Junior
   • Senior
   • Graduate student
   • Not applicable

80) Estimated level of annual family income:
   • Less than $25,000
   • $25,001 - $40,000
   • $40,001 - $65,000
   • $65,001 - $85,000
   • $85,001 - $100,000
   • More than $100,000
APPENDIX B
REGRESSION RESULTS

Adverse Childhood Experiences (ACE)

ACEs are best conceptualized as negative experiences faced by individuals during their formative years. Such experiences include childhood abuse, neglect, and household dysfunction (Dube et al., 2003). To determine how this variable fits into the larger study, it is first important to understand what variables may or may not affect respondent-reported ACE scores.

Table 6a. ACE Score Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>.317</td>
<td>.100</td>
</tr>
</tbody>
</table>

Table 6b. Regression of Adverse Childhood Experience Scores on Independent Variables

<table>
<thead>
<tr>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-1.407</td>
<td>.422</td>
<td>-3.337</td>
</tr>
<tr>
<td>Age</td>
<td>.050</td>
<td>.012</td>
<td>4.106</td>
</tr>
<tr>
<td>Sex</td>
<td>-.150</td>
<td>.106</td>
<td>-1.424</td>
</tr>
<tr>
<td>Income</td>
<td>-.055</td>
<td>.024</td>
<td>-2.270</td>
</tr>
<tr>
<td>VVG Lead to Real Life Violence</td>
<td>.081</td>
<td>.067</td>
<td>1.206</td>
</tr>
<tr>
<td>VVG Should Be More Regulated</td>
<td>-.049</td>
<td>.064</td>
<td>-.761</td>
</tr>
<tr>
<td>VVG Give More Hostile Thoughts</td>
<td>.029</td>
<td>.108</td>
<td>.269</td>
</tr>
<tr>
<td>VVG Raise Physical Aggression</td>
<td>-.006</td>
<td>.118</td>
<td>-.049</td>
</tr>
<tr>
<td>Fav. VG has me Cause Phys. Harm Does Resp. Play VG</td>
<td>.055</td>
<td>.041</td>
<td>1.355</td>
</tr>
<tr>
<td>How Often Resp. Plays VG per Day ESRB of VG Most Played this Week</td>
<td>.271</td>
<td>.166</td>
<td>1.634</td>
</tr>
<tr>
<td>ESRB of VG Most Played this Week</td>
<td>.041</td>
<td>.077</td>
<td>.532</td>
</tr>
<tr>
<td>ESRB of VG Most Played this Week</td>
<td>.013</td>
<td>.035</td>
<td>.368</td>
</tr>
</tbody>
</table>
Tables 6a and 6b display the regression of ACEs on demographics and preconceptions. Based on the $R^2$ value, it can be said that the independent variables—in this model, the demographics and preconceptions—explain 10.0% of the variance in the dependent variable, the respondent’s ACE score. That having been said, while this value indicates some sort of relationship between the independent variables in the model and the dependent variable, ACE, not every variable in this regression was statistically significant.

Any variable in the regression with a p-value at or below an alpha level of .05 was considered statistically significant, while anything above .05 was statistically insignificant. In this model, age and income were significant predictors of ACE, while the rest of the variables are statistically insignificant. Based on the unstandardized regression coefficient for age, for each one unit increase in age, the respondent’s ACE score increases by .05. Similarly, by the unstandardized coefficient for income, it can be said that with each unit increase in reported income, respondent’s ACE score decreases by .055.

**Competitive Orientation**

Competitiveness varies greatly from person to person. That having been said, competitiveness can be conceptualized many ways, from one’s personal desire to compete to one’s tendency to see everyday events or situations as opportunity for competition. However, for this study, competitive orientation is measured most directly as an individual’s internal feelings on and reaction to winning and losing, specifically regarding video games. Table 7a and Table 7b, display the information gathered from the
As with adverse childhood experiences, a regression was also run on the respondents’ competitive orientation concerning demographics and preconceptions. As may be inferred from $R^2$ value, the independent variables in this model, demographics and preconceptions, explained 10.5% of the variance in the dependent variables, the respondent’s competitive orientation. Similar to the previous regression, most of the variables were insignificant in relation to the alpha level of .05. Specifically, every variable other than “how often the respondent plays video games per day” was statistically insignificant.
Given there is only one statistically significant variable in this regression, this will be the only focus for this section. According to the regression, as “how often the respondent plays video games per day” increases by one unit, the respondent’s competitive orientation score increases in turn by 1.418. Overall, this means that the more the respondent plays video games, the higher his or her competitive orientation score will be. This variable is statistically significant, with a p-value of .011.

**Trait Anger**

Trait anger is the “disposition to experience angry feelings as a personality trait” (Spielberger, 1999). However, before simply including it in a regression on hostility, alongside other independent variables like adverse childhood experiences and competitive orientation, it is important to first understand what variables may or may not influence trait anger itself. With this being the case, a regression was run, the results of which are shown in tables 8a and 8b below.

**Table 8a. Trait Anger Model Summary**

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>.344</td>
<td>.118</td>
</tr>
</tbody>
</table>

**Table 8b. Regression of Trait Anger on Independent Variables**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-.610</td>
<td>.453</td>
<td>-1.346</td>
<td>.179</td>
</tr>
<tr>
<td>Age</td>
<td>-.015</td>
<td>.013</td>
<td>-1.146</td>
<td>.253</td>
</tr>
<tr>
<td>Sex</td>
<td>-.198</td>
<td>.1122</td>
<td>-1.771</td>
<td>.077</td>
</tr>
<tr>
<td>Income</td>
<td>.022</td>
<td>.026</td>
<td>.853</td>
<td>.394</td>
</tr>
<tr>
<td>VVG Lead to Real Life Violence</td>
<td>.117</td>
<td>.071</td>
<td>1.644</td>
<td>.101</td>
</tr>
<tr>
<td>VVG Should Be More Regulated</td>
<td>-.087</td>
<td>.068</td>
<td>-1.277</td>
<td>.202</td>
</tr>
<tr>
<td>VVG Give More Hostile Thoughts</td>
<td>.376</td>
<td>.114</td>
<td>3.283</td>
<td>.001</td>
</tr>
<tr>
<td>VVG Raise Physical Aggression</td>
<td>.027</td>
<td>.124</td>
<td>.217</td>
<td>.829</td>
</tr>
<tr>
<td>Fav. VG has me Cause Phys. Harm</td>
<td>.036</td>
<td>.043</td>
<td>.831</td>
<td>.407</td>
</tr>
</tbody>
</table>
With trait anger, a regression using demographics and preconceptions as independent variables would possibly have been enough. However, it seemed possible that adverse childhood experiences may also be a predicting factor in a respondent’s reported levels of trait anger, so the respondent’s ACE score was included in this regression as well. From the $R^2$ value, one can say that 11.8% of the variance in reported trait anger can be explained by the independent variables included in this regression. That having been said, only one variable is statistically significant when held up to a .05 standard.

Noting that out of all of the statistically insignificant variables, one fell very close to the .05 level may be important. At .077, sex was trending toward statistical significance, though because it is above .05, even this small margin of difference is enough to exclude it from further analysis. However, one variable was very statistically significant, having a $p$-value of .001: the ability for violent video games to give the respondents more hostile thoughts. According to the regression, with every one unit increase in respondent-reported likelihood to experience more hostile thoughts from violent video games, the respondent’s trait anger score is expected to go up by .376. To rephrase, the more likely the respondent is to experience hostile thoughts after playing violent video games, the more likely the respondent is to exhibit trait anger.
Hostility

Hostility, for the purposes of this study, has been positioned as the primary dependent variable. Although hostility, in this study, is shown to potentially lead into verbal aggression, which in turn may lead into physical aggression, the ultimate consideration of this study was to what extent an individual’s personal levels of hostility were affected by violent video games and other mediating factors. These mediating factors primarily include demographics, preconceptions, ACE score, competitive orientation, and trait anger. From regressing hostility on these variables, it is hoped that the extent to which these independent variables affect hostility may be ascertained to some degree.

Table 9a. Hostility Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.674</td>
<td>.455</td>
</tr>
</tbody>
</table>

Table 9b. Regression of Hostility on Independent Variables

<table>
<thead>
<tr>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>10.875</td>
<td>1.611</td>
<td>6.750</td>
</tr>
<tr>
<td>Age</td>
<td>-.026</td>
<td>.046</td>
<td>-.565</td>
</tr>
<tr>
<td>Sex</td>
<td>-.234</td>
<td>.395</td>
<td>-.591</td>
</tr>
<tr>
<td>Income</td>
<td>-.064</td>
<td>.090</td>
<td>-.711</td>
</tr>
<tr>
<td>VVG Lead to Real Life Violence</td>
<td>.008</td>
<td>.251</td>
<td>.032</td>
</tr>
<tr>
<td>VVG Should Be More Regulated</td>
<td>-.506</td>
<td>.238</td>
<td>-2.123</td>
</tr>
<tr>
<td>VVG Give More Hostile Thoughts</td>
<td>-.162</td>
<td>.408</td>
<td>-.397</td>
</tr>
<tr>
<td>VVG Raise Physical Aggression</td>
<td>.998</td>
<td>.436</td>
<td>2.288</td>
</tr>
<tr>
<td>Fav. VG has me Cause Phys. Harm Does Resp. Play VG</td>
<td>.014</td>
<td>.152</td>
<td>.095</td>
</tr>
<tr>
<td>How Often Resp. Plays VG per Day</td>
<td>-1.459</td>
<td>.620</td>
<td>-2.351</td>
</tr>
<tr>
<td>ESRB of VG Most Played this Week</td>
<td>-.683</td>
<td>.288</td>
<td>-2.371</td>
</tr>
<tr>
<td>ACE Score</td>
<td>.111</td>
<td>.129</td>
<td>.865</td>
</tr>
<tr>
<td>Comp. Score</td>
<td>.168</td>
<td>.204</td>
<td>.824</td>
</tr>
<tr>
<td></td>
<td>-.056</td>
<td>.029</td>
<td>-1.968</td>
</tr>
</tbody>
</table>
As the primary dependent variable of this study, hostility was regressed on a plethora of independent variables: demographics, preconceptions, adverse childhood experiences, competitive orientation, and trait anger. Based on the value of $R^2$, 45.5% of the variance in hostility is explained by the independent variables included in this regression. In this regression, six variables were statistically significant: the respondent belief that violent video games should be more heavily regulated, the respondent-reported extent to which violent video games increase the respondent’s own physical aggressiveness, whether or not the respondent plays video games, how often the respondent plays video games, the respondent’s competitive orientation score, and the respondent’s trait anger score.

According to the regression, for each unit increase in the variable regarding if respondents believed violent video games should be more heavily regulated, the respondent’s hostility score is expected to decrease by .506. This variable is statistically significant at .034. For each unit increase in the extent to which violent video games raise the respondent’s personally-exhibited levels of physical aggression, respondent hostility is expected to increase by .998. This was also statistically significant, at a p-value of .023. As for the respondent’s experience playing video games, if the respondent plays video games, their hostility score is expected to decrease by 1.459, while for each unit increase in how often the respondent plays video games, the respondent’s hostility score is expected to decrease by .683. These variables are statistically significant at .019 and .018, respectively.
While ACE score was not statistically significant in this regression, competitive orientation and trait anger were, at 0.050 and 0.000 respectively. For each unit increase in competitive orientation score, the respondent’s hostility score is expected to decrease by 0.056. As for trait anger, as the respondent’s trait anger score increases by one unit, his or her hostility score is expected to increase by 2.537. While both are clearly statistically significant, trait anger seems to more profoundly affect hostility than competitive orientation. Regardless, given that they are both statistically significant, considering both in further analysis on this regression is important.

**Verbal Aggression**

In the sense that hostility is an attitude, for this study, verbal aggression, and physical aggression by proxy, is a behavior. To word it more simply, while hostility is what an individual feels internally, aggression is what the individual exhibits externally. Ergo, for the case of this study, hostility is projected to potentially lead into verbal aggression. For the case of this regression, all variables that were shown to lead into hostility were also included in the regression of verbal aggression.

<table>
<thead>
<tr>
<th>Table 10a. Verbal Aggression Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 10b. Regression of Verbal Aggression on Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>-.466</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Income</td>
</tr>
<tr>
<td>VVG Lead to Real Life Violence</td>
</tr>
<tr>
<td>VVG Should Be More Regulated</td>
</tr>
<tr>
<td>VVG Give More</td>
</tr>
</tbody>
</table>
To determine what impact, if any, hostility had on verbal aggression, as well as what impact the other independent variables may have as well, a multiple regression was calculated. To that end, much can be garnered from the data provided by said regression that may indicate what may or may not escalate internal hostility into external, verbal aggression. Based on the $R^2$ value for this regression, it is asserted that 39.4% of the variance seen in verbal aggression can be explained by the variables in this regression. Before looking over specific variables though, singling out which variables in this regression are statistically significant at the .05 alpha level is vital. For this regression, four variables were statistically significant.

The four statistically significant variables include sex, with a .041 p-value, the preconception that violent video games lead to real life violence, with a .001 p-value, the respondent’s trait anger score, with a p-value of .000, and the respondent’s hostility score, also with a p-value of .000. What may be important to note is how low the p-values are for the latter three of these four variables. While the alpha level used for the purposes of this study is .05, three of these variables are also significant at a .001 level. So, while these would be considered significant at any value up to .05, these three variables stand
out as especially significant. Though again, for the purposes of this study, this is more of an interesting tidbit than an analysis-shifting piece of information.

By what the regression says, if you are male, your likelihood of being verbally aggressive increases by .175. Additionally, the more you believe violent video games lead to real life violence, the less likely you are to be verbally aggressive, as with every one unit increase in this preconception variable, the respondent’s likelihood to be verbally aggressive decreases by .183. As for trait anger, for each unit increase in the respondent’s trait anger score, the respondent’s likelihood to be verbally aggressive increases by .264. Last, the regression indicates that for each unit increase in the respondent’s overall hostility score, the respondent’s likelihood to be verbally aggressive increases by .081.

**Physical Aggression**

In this study, physical aggression must be preceded by some verbal, or otherwise nonphysical, form of aggression. It is assumed, for the sake of a coherent and logical model, that an individual is highly unlikely to act in a physically aggressive manner without having previously exhibited some verbal or otherwise nonphysical aggression. Additionally, just as hostility does not necessarily progress into verbal aggression, verbal aggression does not necessarily progress into physical aggression; even if an individual does allow himself or herself to lash out verbally because of heightened hostility, this individual may not necessarily lash out physically. Based on the data collected for this study, the extent to which verbal aggression does proceed into physical manifestation should become tangible.
As indicated by this regression’s $R^2$ value, 45.7% of variance in physical aggression can be explained by the variables included in this regression. Of these variables, only four were statistically significant at the .05 alpha level. That having been said, two variables came close to this level. These include the variable indicating to what extent violent video games give the respondents more hostile thoughts, with a $p$-value of .055, and the variable regarding whether or not the respondent plays video games, with a $p$-value of .054. While these cannot be included in the analysis proper, as they fall above the .05 standard, this may be an indication for future research to still consider these
variables in future analysis, as this small margin of insignificance may potentially be the result of chance.

As for the four variables showing statistical significance at the .05 alpha level, the first is the variable indicating to what extent violent video games increase the respondent’s own physical aggression, with a .000 p-value. With each unit increase in this variable, the respondent’s likelihood to be physically aggressive increases by .336. Trait anger, with a p-value of .001, indicates another positive relationship. As the respondent’s trait anger score increases by one unit, his or her own likelihood to be physically aggressive increases by .176. The respondent’s hostility score, with a p-value of .006, also shows a positive relationship. With each unit increase in the respondent’s hostility score, the likelihood for the respondent to be physically aggressive increases by .035. And, per the regression, as the respondent’s verbal aggression score, which holds a p-value of .000, increases by one unit, the respondent’s physical aggression score is expected to increase by .410.