

**VIOLENT VIDEO GAMES AND AGGRESSIVE BEHAVIOR: WHAT, IF ANY, IS THE
RELATIONSHIP?**

By

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Abstract

The aggressive behavior of video game players disturbs the public order and has led to a significant public discussion over the past two decades. Video game players are often students or teens. Colloquial explanations for aggressive behavior among teens often point to an alleged link between aggressive behavior and video game play. This paper will introduce, summarize, and analyze the current empirical research on the aggression-video game link. A review of the literature finds three possible relationships between video game play and aggressive behavior: a positive association, a negative association, and a “null” relationship. This review argues that the most rigorous research generally concludes that there is no relationship between video game play and development of aggressive behavior.

Introduction

School shootings have captured media attention and become a public concern in recent decades. Often, the perpetrators of this violence are students or teens, and the root cause of the violence is attributed to excessive video game play or exposure to violent scenes in such games. For example, Seung-Hui Cho, a mass murderer who killed 32 people at Virginia Polytechnic Institute and State University was said to be addicted to the “Counter-Strike” video game (Rocque 2011:307). While the public often believes that video games encourage people to commit crimes, this may not necessarily be the case. That is, even though video game play may be associated with aggression, it may not be a causal relationship. An important fact is that the relationship of video games and crimes is different from the correlation of video games and the development of aggressive behavior. This thesis begins by discussing results from existing studies concluding that video games encourage people to behave aggressively.

Much of the literature consists of meta-analyses, which can be described as aggregate studies of prior empirical research. The meta-analyses generally find that participants who spend time playing video games are exposed to violent scenes and develop aggressive behavior. Meanwhile, other variables of participants, such as age, race, and gender, are analyzed. The study demonstrates that each of these variables causes different video game related effects (Sandra et al. 2017). Besides, more specific details of correlation are discussed, like how different kinds of video games (online and offline) result in different effects.

In what follows, this thesis will highlight the limitations of the research that suggest a positive association between video game play and aggression. These limitations focus on how long-term analysis is largely absent from these studies and the ways in which results from social psychological experiments suffer from issues of reliability and validity. I then review the existing literature that demonstrates a negative or “null” association between video games and aggressive behavior. One notable finding from this body of research is that video game play is not a predictor of aggression. Instead, familial and societal factors best explain aggression (Decamp et al. 2017).

The present study also discusses the explanations for why these areas of research often yield mixed results regarding the relationship between video game play and aggression. One primary reason for these differences is that researchers may diverge in their conceptualization of the term “aggression” and may operationalize it in different ways. Psychologists, for example, tend to observe and document participants’ psychological responses to playing video games, while sociologists focus on video game players’ engagement in criminal behavior as well as crime rates at the aggregate level in societies displaying a higher level of video game play. After analyzing both arguments, I conclude that the studies citing a negative or null relation prove

more reliable and trustworthy. The thesis concludes by highlighting the reasons why social scientists examine this particular social issue, and why we should not become too anxious about the influence of playing video games.

Research Demonstrating a Positive Association

A major stream of studies in this line of research focuses on the positive relationship between video game play and the development of aggressive behavior. Through her meta-analyses, Calvert Sandra and colleagues (2017) discloses the relationship of playing video games and aggression. They organize the study into two major analytic parts. The first part of the analysis is participants' backgrounds and personal characteristics, such as age, race, gender and other risk factors. In one of the studies, almost all the teenagers aged 12 to 17 years old are considered to be exposed to video games. In particular, 41% of adolescent males and 18% of adolescent females are daily game users (Sandra et al. 2017). One other study demonstrates that the percentage of ethnic minority children among all video game players is increasing, and in the next 50 years, the rate will increase by roughly 16 percent.

The second part of the analysis focuses on some dependent variables, such as aggressive behavior, violent influence, and cognition (Sandra et al. 2017). The degree of those variables is measured by self-report questionnaires or others' ratings of aggression. The result demonstrates that video games are associated with an increased aggressive behavior and decreased empathy. Males, ethnic majorities, and adolescents are more likely to be exposed to video games and behave aggressively. By studying the current related studies about the short-term influence of video games on people's behaviors, Sandra concludes there is a strong positive relationship between video games and aggressive action (2017).

While Sandra and her colleagues' meta-analysis does not include how video games influence young children, Anderson and his colleagues' analysis focuses more on preadolescents. Their research article "Violent Video Game Effects on Aggression, Empathy, and Prosocial Behavior in Eastern and Western Countries: A Meta-Analytic Review" demonstrates that the period spent on playing video games is a leading factor in aggressive behavior (Sandra et al. 2017). They use the meta-analytic procedures as their primary approach.

In the analysis, while researchers control for variables such as gender and age, the amount of time participants spend on playing video games determines the degree of aggressive behaviors they develop. Aggressive behaviors examined in this research include experimental programs, a self-report questionnaire, and rating of aggressiveness from others. According to Anderson and his colleague, the effect of culture, gender, and age is not significant in any of the research designs (Anderson et al. 2010).

Here, authors believe that those characteristics are not related to the effects of video game play. Instead, the period of playing video games is the most related to the effects of playing video games than other variables, such as culture, gender, and age (Anderson et al. 2010). The result shows that for analysis, $r+ = 0.210$ (positive correlation). The "r+" of time length is higher than "r+" of other variables. The relationship is that the longer a person plays video games, the more he is exposed to them, and the more likely he develops violent behaviors.

Furthermore, this result is consistent with those of Gentile and colleagues' study. They find that the younger children start to play video games, the more likely they will develop aggressive cognitions. Gentile, a child psychologist from the University of Minnesota, studies what variables associated with video game players affect the development of aggressive behavior.

Gentile and colleagues' research includes the study of 3034 children and adolescents of different ages. Their degrees of aggressive cognitions are measured on the 4-point scale (strongly disagree to strongly agree). In addition, each child is given the Children's Empathic Attitudes Questionnaire, which measures how easily he/she gets upset (Gentile et al. 2014). They find that the younger children start to play video games, the more aggressive cognitions they develop in the future (they have high points on the degree of aggressive cognitions). The research also states, "this effect is not moderated by sex, prior aggressiveness, or parental monitoring and is only slightly moderated by age" (Gentile et al. 168:450). Therefore, their main point is that the age is the only factor that relates to the influence of video games. This is one of the significant findings that states video game play has a positive impact on aggressive behavior.

Besides the major findings, it is essential for us to learn about other studies that discuss how different types of video games affect people's behaviors differently. This is because types of video games vary, and they play a significant role in our analysis of effects. Also, little is known about the differences between online and offline video game players.

The object of Mate Smohai and colleagues' study is to examine the difference between online and offline video game players (2017). After analyzing the Problematic Online Gaming Questionnaire completed by 1964 video game players, Smohai and colleagues propose that online video game players have more interpersonal conflicts and social isolation (2017). Each participant is asked questions about his/her video game playing habit, his/her behavior and personality. Smohai and colleagues mention that "Those gamers who played at least sometimes in an online context were considered as 'online gamers,' while 'offline gamers' were those who played video games exclusively offline" (2017:111). According to the model, online gamers are

more likely to score higher on overuse, interpersonal conflict, and social isolation (Smohai et al. 2017).

The word “online video games” leads people to think that players who play these types of games have more social interactions, and they are supposed to have more contact with people. Why it is the case that they scored higher on social isolation? It is because the overplay of online video games keeps them in the online gamers’ communities, which distracts their attention from the existing real social context. Therefore, they put less focus on their family and friends, which results in social isolation. It is important to understand the difference between video game players: how do different types of video game play lead those players to develop different characteristics? In a way, studying it helps to improve the prevention program and solve the possible detrimental consequences of online video game use.

Also, another study conducted by Yao Mike and colleague indicate that how male college students playing sexually explicit games lead them to have sexually objectifying thoughts and misbehave toward women (Yao et al. 2010). They design an experiment to exam the short-term effects of playing a sexually explicit video game on male players (Yao et al. 2010). Seventy-five college students are randomly assigned to play sexually explicit games, and their sexually objectifying thoughts are measured on a scale. The result shows that students who play more sexually explicit games tend to treat a woman as sex objects, so they behave inappropriately toward women (Yao et al. 2010). The reason I study the effects of types of video game play is to inform the paper with more valuable information about the relationship of video game play and change of behaviors.

The exposure of video games also has different effects on different groups of players. The purpose of Greitemeyer’s research is to “exam the idea that the effects of video game play

are stronger when the target is a member of an outgroup rather than an ingroup” (2014:1). In sociology, an ingroup is a social group in which a person is identified as a member of the group. An outgroup is a group in which a person does not belong to the group. In a cross-sectional correlational study, participants are asked about how often they play video games to determine whether they are ingroup or outgroup. Their behaviors are then measured at a scale of ethnocentrism and aggression. At the end of the experiment, it appears that video game exposure indeed has a smaller effect on an outgroup member rather than an ingroup member (Greitemeyer 2014). In other words, participants who do not usually play video games tend to have more exposure to video games, and they tend to develop a stronger aggressive cognition.

The research conducted by Greitemeyer further discusses how video game violence is associated with decreased cooperative behavior, and meanwhile, single-playing video games result in decreased cooperative behavior comparing to cooperative-playing video games (2012). 32 students from a German university participated in the research, and they were assigned to play video games that had different scales of the cooperative level. The data illustrates that once a participant plays a cooperative team-player video game, it increases his/her willingness to cooperate with other people when he/she makes a decision (2012). The public should be cautious of this fact because once a group of people commits crimes cooperatively, it results in more severe and dangerous consequences. Greitemeyer’s research provides multiple perspectives, like types of people and video games, to support the positive correlation between video games and aggressive behavior comprehensively.

Limitations of Research Demonstrating a Positive Association

This section discusses why even though many studies agree on the same argument (positive relationship), the positive correlation between video game play and aggressive behavior is not proven. The main reason is that there are many limitations associated with studies that argue for the positive relationship.

From Sandra and colleagues' research, many questions remain unexplored. For example, while video games' effects vary with age, children younger than 10 years old are rarely studied. Many questions on young children, like whether video games have a stronger impact on young children or not, are not yet explored. Therefore, we cannot know the relationship between video games and aggressive behavior thoroughly on all ages. It leaves a gap in their study (Sandra et al. 2017). Moreover, questions about the differential influence on males and females remain unanswered. Typically, males engage in more physical aggression than females (Sandra et al. 2017). While physical aggression is mainly discussed, other different kinds of aggression-related dependent variables between genders, such as aggressive cognition and level empathy, are rarely discussed. In the future, it is necessary to do more research and discover more differences between video game influences on genders.

One more noticeable question from this research is that the types of video games are not studied reasonably. Video games have several features, such as rapid pacing, fast action, and sound effects. The fact is, definitions of those features changed over time. In the former study, the word "pacing" refers to the rate of scene and character change. In the recent study, this word is defined as action (Sandra et al. 2017). Also, other terms have been defined differently over time, and it creates confusion on the result of studies.

At the end of the article, Sandra and colleagues admit that no single factor consistently leads a person to act aggressively or violently. Rather, the accumulation of factors come together

and result in aggressive behavior. It has been a difficulty to figure out what other factors are, how to control them, and how to explain the relationship between them and influence of video game play. The appearance of those questions indicates that variables of those studies are not well controlled; thus, we cannot confirm the positive relationship between video game play and aggressive behavior.

The limitation is not only in Sandra and colleagues' research, but also it exists in Anderson and colleagues' meta-analysis. We cannot know if the results we gain from the analysis are trustworthy and practicable in real society. Anderson and colleagues mention in their research that the current studies are not united; "different studies measure different types of aggression and video game habits, include different participant populations, and take place during different years" (Anderson et al. 2010:21). According to them, those differences make the study of the relationship between video games and aggressive behavior more challenging.

When the question comes to whether the information collected from participants are fully trustworthy, the answer is no. Since participants are volunteers, there is no promise that they will always dedicate themselves to the experiments and provide adequate data (Anderson et al. 2010). Things may happen, like they may not tell their real thoughts when they are asked about how severely they behave inappropriately. Also, they may fake the time spent playing video games. Some participants even quit experiments halfway. Therefore, the report is a short-term result instead of a long-term result (Anderson et al. 2010). Again, it is always hard, or almost impossible to collect credible and sustainable data from participants.

For instance, the research completed by Gentile and colleagues has these kinds of limitations. In the experiment, "researchers use self-report measures, which may be affected by the self-report bias"; children being studied do not tell their true conditions of video game play,

or they do not behave honestly in terms of aggression (Gentile, Li, and Khoo 2014:450). In order to deal with this limitation, they plan to add parents’/ teachers’ reports or any observational measures in the future study. However, there is nothing he can do to fix the defaults and inaccuracy of the research he has completed analyzing.

Many of the current researchers do not mention about whether their studies evolve long-term analysis or not, in order to hide the fact that their study only contains the short-term analysis. Because video games are relatively newly invented, and especially those with crime scenes do not get popular until the 1990’s. It is a very significant limitation of our current study because no long-term influences are accessible from experiments. Mike Yao and colleagues state in their article that the flaw of his research is “the present study focuses primarily on immediate cognitive effects of playing sexually-oriented games” (Yao et al. 2010:78). Indeed, immediate, short-term consequences of playing video games cannot give firm support to the argument that video game play leads people to behave violently and develop their aggressive cognition. More future studies are needed to complete to study the long-term effects of video game play.

Although pre-post and repeated measurements are necessary for following up the experiments, it has been a challenge to practice the long-term experiments. Besides the challenge of successfully recruiting participants for a long term, long-term experiments itself does not fit and cooperate the design of short-term experiments. According to Anderson and colleagues, “Longitudinal designs solve these problems to some extent, but such designs do not allow experimental tests of the immediate, short-term consequences of playing violent video games” (2010:21). It means experiments designed for long-term studies are usually not applicable for short-term studies. Similarly, experiments designed for short-term studies cannot extend to long-

term studies. When variables have to be adjusted for either short-term or long-term experiments, it may cause problems for researchers to collect data from participants.

There has been confusion on the causation relationship between playing video games and behaving aggressively. While studies mentioned by those scholars support the positive relationship that playing video games leads participants to act aggressively, none of them explains how it is the right causation relationship. There is another possibility that participants with violent cognition tend to play video games, and that is why they often scored higher on aggression level. However, this gap of information is not discussed in their research papers.

The American Psychological Association mentions what is unexplored from the current studies. Some questions need to be resolved, such as “The relation between the degree of exposure to video games and negative outcomes,” “The persistence of negative outcomes over time,” and “The impact of rapidly changing game technology and formats on users’ experience and outcomes” (APA 2015:9). Again, if we talk about the influences of playing video games without controlling the degree of exposure, types of video games and participants, and constantly following up on the people’s reactions, the result will be meaningless.

Some studies indicate that the type of video games need to study separately to support the argument of “positive relationship,” but many experiments fail to prove that playing video games leads people to develop aggressive behaviors because they do not distinguish the type of video games. Teena Willoughby, a Psychology professor at Brock University, investigates adolescents who are in Grade 9 to Grade 12 with her colleagues. Participants are surveyed about the frequency of their video game play and the degree of their aggressive behavior (Willoughby et al. 2011). The conclusion from the study is many players who play nonviolent video games that do not involve any competition tend to be more peaceful than violent video game players

(Willoughby et al. 2011). In this case, non-violent video games have no harmful effects on those adolescents' behavior. Thus, we cannot support the assertion "all video games lead people to behave aggressively." Again, there is no long-term experiment available for Willoughby's study. Therefore, more studies are needed in the future.

Research Demonstrating a Negative/ No Association

Whitney Decamp and colleagues are skeptics who believe there is a small correlation between video game play and violence-related outcomes, and the purpose of their research is to prove the validity of this statement. They examine a group of students in the eighth (n = 5133) and eleventh grade (n = 3886). They answer questions, such as if they have the intentions of hurting other people, and how often do they play video games (2017). Some other independent variables about participants' families are investigated. Sample questions are, "my parent show me they are proud of me," "my parent takes an interest in my activities," "my parent listens to me when I talk to them" (Decamp et al. 2017:391-392). Other independent variables like gender, race, and poverty are controlled.

The result provides a summary that video game play is not a meaningful predictor of youth violence (Decamp et al. 2017). Instead, family and social variables are more meaningful predictors. The data points out with all controls included, video games are not significant influential factors, especially for eleventh-grade students. In contrast, the models show strong support for many of the familial predictors of violence (Decamp et al. 2017). The criminological theory provides support to the negative correlation between good parenting and crime. In other words, the more parents show their kindness and interest in their children, the less likely their children behave violently. The conclusion we can get from here is, while the experiment proves

the weak connection between video game and youth violence, the effect of family and social factors is consistent and strong.

This research argues against the popular theory that video games encourage the youth to behave violently. From Decamp and colleagues' study, a new perspective of effects of video games is demonstrated to readers. While scholars discuss whether video games lead the youth to behave aggressively, they ignore the more critical factors, which are the family factors and living environments that are discussed by Decamp and colleagues. The fact is that video games by themselves cannot change the cognition of a child, but instead, parents' attitudes and education continuously influence their children's behavior.

Another recent study indicates that the relationship between video game play and aggressive behavior is identified as a negative correlation. Kevin McCaffree and colleagues study whether the relationship between video games and the crime rate is positive or negative (McCaffree and Proctor 2017). This research uses outcomes measures such as competitive and aggression, which has questionable external validity with rates of violent crime (McCaffree and Proctor 2017). Unlike the social psychological analysis (micro level) that is widely used in other studies, macro level of analysis is applied to his research: the study of how video game play relates to the crime rate, including the rate of aggravated assaults and rate of homicide, in different periods of time.

The outcome shows that indoors video game play leads to a lower rate of crime in society. From the article, (1) from 1978 to 2011 there was no annual association between video game play and development of aggression; (2) between 2007 and 2011 there was a negative relationship between the monthly sales of video game and number of violence; (3) between 2004 and 2011 there was a negative correlation between video game walkthrough Google searches,

which is the measure of video game play, and rates of violence following keyword searches; and (4) that releases of popular video games were unrelated or negatively related to crime rate and homicide rates for half year after a game's release (McCaffree and Proctor 2017). Therefore, the result demonstrates that we cannot find there is a positive correlation between video game play and aggressive behavior. Instead, the negative relationship is often found from research.

Some explanations for why people who spend a big amount of time on playing video games commit fewer crimes are given by McCaffree and colleagues. First, it is the case because playing video games reduces the appeal or marginal utility of real-world violence. In other words, once a game player is addicted to one video game, he/she would think it is meaningless to commit violence in the real world because there is no incentive for doing that. He/she would rather spend more time completing missions, including violence-related tasks, to receive more rewards. Second, since a video game player spends most of his/her time at home playing video games, he/she will not have an opportunity to commit crimes in the real world (McCaffree and Proctor 2017). It is more about the question of choosing: whether you select playing video games at home or commit crimes in the real world, you can only pick one. In most cases, addicted video game players choose the first option.

Since video game play does not have a positive correlation with crime rate, what are the important factors? The study continues to explain that personal income and expenditure levels are the factors that contribute the increase in crime rate in societies. In McCaffree and colleagues' words, "adjusted durable good expenditure per capita were negatively related to robbery ($\beta = 0.003$, $p < .05$) and poverty rate was negatively associated with larceny rates ($\beta = -71.251$, $p < .01$) and total property crime rates ($\beta = -110.635$, $p < .01$)" (2017:49). This fact is very reasonable because only the people who have no jobs, low income, or are in need of higher

expenditures will increase the motivation of potential offense to societies. Those people need to do so to improve their life qualities. On the other side, the purpose of video game players to commit crimes against societies is unknown. Recall that addicted video game players would rather stay at home to complete their missions and get rewards, instead of entering the real world and causing violence for a low-utility purpose. Whether I analyze the research from the micro perspective or macro perspective, I can both conclude that video game players have no reason to commit crimes. Therefore, there is negative or no relationship between video game play and criminal behavior.

Besides, the similar experiment was applied to young children, and also, the result is that their increased bullying behavior has no correlation with their video game playing behavior. The research conducted by Christopher Ferguson and colleagues is to discover whether children with average age of 13 are influenced adversely by exposure to video games. In the research article, 377 children participate in the experiment and are studied. Their symptoms of depressions are examined by using the Pediatric Symptom Checklist (2014).

For example, they are asked to rate whether they experience some mental disorder symptoms and how often they experience these symptoms. Besides, they are asked the types of video games they play: among the video games they frequently play in recent months, each game gets a rating score, including violent content, sexual content, and use of drugs (Ferguson et al. 2014). All the procedures in this study are approved by the local IRB and comport with APA standards. In a way, it builds a substantial evidence for Ferguson and colleagues' argument.

The result demonstrates that there is no evidence that increased bullying behaviors of children have a relationship with video game playing behaviors regardless of the fact that boys have more exposure to video games than girls. Few limitations are presented in the research as

well, but it is merely about the difficulty of measuring mental disorders, which has no impact on the final result. From the result, the video game by itself is too distal to affect children's behaviors and mental health symptoms (Ferguson et al. 2014). There are many hidden variables, such as parents' personality, family background, and the environment they live in, are more likely the main factors developing children's aggressive cognitions.

Thus, no evidence supports the hypothesis that children with evaluated mental health disorders are considered a "vulnerable" population for violence influences of video games (Ferguson et al. 2014).

Analysis of Research on Two Opposite Sides

From the current studies, there is a notable difference between the results that support the positive correlation between video game play and aggressive behavior, and negative/ no relationship of that. The following paragraphs will explain why such difference in opinion exists. Some major reasons are the difference of real-life performance and experimental performance, the difference of perspective of researchers, and the difference of focus of dependent variables.

First, research that supports the positive relationship mostly depends on the short-term experiments. It gives a reasonable explanation for why researchers whose data based on the short-term tests tend to illustrate the temporary, shallow effects of video game players, instead of the psychological effects that affect their future criminal behavior. Furthermore, the data they collect from experiments does not apply to those participants' real-life performance. For instance, the meta-analyses in Sandra and colleagues' paper includes research that discusses how participants' characteristics, such as age, race, gender, and other risk factors associate with influences from playing video games. Then, the degree of influence of video games is measured

by five variables like aggressive behavior and cognition (Sandra et al. 2017). From here, we can see all the data collected are short-term experimental based. The result shows the positive relationship between video game play and aggressive behaviors. However, the problem of short-term experiments is, participants tend to demonstrate some temporary influence from video games, and it cannot represent anything. Also, the data cannot be collected continually and correctly over time because of the exiting of participants and the change of methods. It is why we cannot extract too much useful data from those.

On the other side, the real-life performance of video game players tends not to demonstrate any game-related violation or aggressive cognition. In Ferguson and colleagues' study, the depression of participants who often play video games is examined by Pediatric Symptom Checklist. The specialty of this checklist is, this is the analysis of whether social media affects real-life violence. In their words, "By societal violence, we refer to a range of behaviors, from bullying and physical fighting to criminal assault and even homicide, which are of concern to law-markers and parents" (2014:127). Since the data is based on real-life condition, which is video games influence both aggressive behavior and criminal violence, it provides stronger support that the study from Ferguson and colleagues is more relevant to us. The result is that video games are associated with neither criminality nor bullying behaviors in children (Ferguson et al. 2014). Nor did he find out that the support of trait aggression interacts with video game violence. It provides reliable evidence for the argument that supports the negative/ no relationship between video game and aggressive behavior.

Indeed, the real-life data is what we care about, and it is the purpose of our study: Does playing video games influence our behavior? If so, how does it change our cognition and how can it result in negative consequence? When it conflicts with the laboratory data, we will choose

the real-life data because it can help us better understand how playing video games affect us. In addition, as mentioned before, during experiments, participants are likely not to cooperate with the researchers over time. They may not perform naturally, and it cannot represent the real reaction. Therefore, as long as we have access to real-life data, we pay more attention to it.

One remarkable fact to mention is psychologists tend to focus their research on cognitive influence by video games playing, and their conclusion supports the positive relationship between video games and aggressive behavior. In Gentile and colleagues' research article, typical psychological measurements are used as evidence for his argument. According to them, methods such as conservative statistical controls, multiple moderator analyses, and sensitivity analyses are typical analyzing methods that are used to measure participants' psychological effects from video game play (Gentile et al. 2014). More specifically, participants' degree of aggressive cognition is measured on the 4-point scale based on questions that measure how easily participants can get irritated (Gentile et al. 2014). Results of various sensitivity analysis conclude that the younger and the longer children start playing video games, the more likely they develop aggressive behavior. Therefore, from a perspective of a psychologist, the positive relationship is supported because he only observes how participants react aggressively from playing video games, but the overall crime rate from video game players is unmentioned.

Differently, sociologists typically focus on how likely video game players commit crimes or suicide as the effect of video game play, and they argue that there is no/ negative correlation between video games and the crime rate. In this case, criminal rate represents one's behavioral effect from video games. According to McCaffree and colleagues, playing video games reduces the appeal or marginal utility of real-world violence, and players would like to stay at home playing video games to receive "great rewards" (2017). Therefore, it is not possible for them to

commit crimes in the real world. As a result, sociologists believe that video gameplay has no contribution to the increase in the crime rate of our nation.

The reason we see psychologists and sociologists conclude different result is, each of them have their separate ways to identify behaving aggressively. For psychologists, they believe having aggressive cognition are considered acting aggressively; nonetheless, sociologists argue the change of crime rate associated with video game play matters more. For the question whether video game play affects aggression, it depends on readers' understanding of the word "aggression."

Furthermore, we see the different outcome from various research because authors focus on different dependent variables. In Anderson and colleagues' research paper, while all other independent variables are controlled, such as gender, age, and race, the relationship of the length of time participants spend on playing video games and the aggressive cognition they develop is studied (2010). Their discovery is, the longer participants spend on playing video games, the more likely they develop aggression. Their research demonstrates a significant inefficiency because they merely study the effect of video game playing time. It cannot illustrate to readers a comprehensive explanation of the influence of video game play.

On the other side, Decamp and colleagues' study focuses on the family and social variables of participants. He concludes that video game play is not a meaningful predictor of youth violence; instead, family and social variables are more meaningful predictors (2017). Their discovery strengthens the argument that video gameplay has no correlation with the development of aggressive behavior.

The fact that Anderson, Decamp, and their colleagues' study on different dependent variables lead them to have different outcomes. Anderson and colleagues ignore the significant

effect participants' background (family and society) may contribute to the shaping of their personalities and behaviors. As well, while they determine how playing video games can cause a person to behave aggressively, they cannot decipher the causation relationship of these two variables; they do not know whether playing video games causes people to act aggressively, or aggressive people tend to play more video games. Comparatively, Decamp and colleagues answer this question well; they point out that effects from participants' families shape their personalities and behaviors, including encouraging them to play video games (2017). Therefore, because of Decamp and colleagues' perspective and thoughtful research, their conclusion seems more trustworthy than Anderson's.

Conclusion

In conclusion, based on an extensive review of research, there is no proven positive relationship between video game play and development of aggressive behavior. Because the majority of studies stay focused on the short-term effects of video game play, long-term results are currently not available in any of the studies. In addition, I cannot determine the causation; it is undiscovered that whether playing video games leads people to behave aggressively, or aggressive people tend to play video games. Most important, from a broader perspective, participants who play video games frequently do not have higher crime rate than a normal person. Therefore, I cannot determine the hazard or negative influence from playing video games.

The reason I conducted this study is to demonstrate the influence of video games to the public. Because media widely broadcasts that video game addicted people often have aggressive behavior and cognition, the public starts to develop a wrong opinion that playing video games

has a harmful influence on teenagers' cognition development. However, this misleading information makes people become paranoid about the harmfulness of video game play. The fact is, video game playing performs as a single variable that does not shape people's cognition or their behavior. Family, financial conditions, and the environment associated with those people are the stronger predictor of the violent level of society (Decamp et al. 2017). Those are the factors we should be more aware of. In order to help teenagers to behave appropriately, we need to promote education, help families that need financial support, and do other actions that can bring benefits to the public. Again, we should not merely focus on how playing video games causes people to behave aggressively and then take "positive" action by rejecting video games.

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